

**Exploring and expanding learning processes in
sustainable agriculture workplace contexts**

Thesis submitted in fulfilment of the requirements of
the Degree of Doctor of Philosophy
Rhodes University

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January 2010

Abstract

The focus of this study is to explore and expand farmer learning processes in sustainable agriculture workplace contexts. It examines change oriented learning processes in the context of three sustainable agriculture practices. The study begins by discussing the history and emergence of environmental discourses and approaches; sustainable agriculture; and the histories of three kinds of sustainable agriculture practices: Permaculture, Organic Farming and Machobane Farming System. It also traces the evolution of agricultural extension approaches within the wider context of education for sustainable development. The main focus of the study is an exploration of how farmer learning can be mediated through an expansive learning process. The study methodology surfaces some of the contradictions in sustainable agriculture and learning activity systems that farmers encounter in learning and practising sustainable agriculture. It uses these contradictions as sources of expansive learning in and between the respective activity systems of farmers, sustainable agriculture facilitators, agricultural extension workers (conventional) and organic entrepreneurs. As shown in the study, the expansive learning processes result in the modelling, implementation and reviewing of solutions to contradictions being faced in the learning and practice of sustainable agriculture. The study also proposes a number of tools that can be adapted and used by development farmers and agricultural trainers to examine and expand learning as well as build farmer agency.

The study was conducted in three case study sites in Lesotho, South Africa and Zimbabwe. In Zimbabwe the study is located in Hwedza district in the St Margaret Primary School and community that learn, practise and facilitate the learning of Permaculture within the Schools and Colleges Permaculture Programme (SCOPE). The second study site is in South Africa: Durban urban and peri-urban areas where a community of organic farmers, facilitators and entrepreneurs coordinate the marketing of their produce through Isidore Farm and Earth Mother Organic and support each other to learn and practise organic farming. The third study site is based in the Mafeteng and Mochale's Hoek districts of Lesotho where the focus was on farmers who learn and practise the Machobane Farming System (MFS) and are supported in this by the Rural Self Development Association (RSDA) and the Machobane Agricultural Development Foundation (MADF).

Drawing on three sensitising concepts of dialectics, reflexivity and agency, the study worked with Cultural Historical Activity Theory (CHAT) underpinned by critical realism to reveal how farmer learning is mediated and expanded. The theory of practice/habitus also provided a useful theoretical lens with which to examine data generated. Using a two-phased, multiple embedded case study approach, the study worked within the broad framework of social

learning. It used semi-structured individual and group interviews, observations and document analysis to explore learning processes and generate „mirror“ data. This data was then used in Change Laboratory Workshops, within the Developmental Work Research methodology, where double stimulation and focus group discussions contributed to expanding learning processes. Drawing on critical realism the study used inductive, abductive and retroductive modes of inference to analyse data in each case study as well as across case studies.

The findings of the study reveal that farmer learning is influenced by both intrinsic motives, such as identity, and extrinsic motives which are primarily associated with economic, ecological and health benefits. Farmers learn through scaffolding and mediating tools that link everyday and scientific knowledge. They also learn from fellow farmers through observation, practising and experimentation. Some of the issues that were raised in connection with farmer learning processes are: language; time to learn, practice and appropriate concepts; time to improve the natural resource base while at the same time improving income generation; and responses to climate change. The study also found that farmer learning and practice of sustainable agriculture in the case studies investigated, is influenced by past and current agricultural and educational policies; societal values and attitudes; social and cultural backgrounds; work affordances and gender relations; quality of training offered; poverty; and, HIV and AIDS. In the second phase of the study, which built on the problematic situations being encountered by research participants (sustainable agriculture farmers, sustainable agriculture facilitators, extension workers, and organic marketers) to surface contradictions, the main finding was that the expansive learning process has potential to enhance farmer learning and practice of sustainable agriculture. It does this by mobilising distributed cognition among participants as well as their preparedness to act. Through the expansive learning processes in each case study, research participants were able to question their practices, surface contradictions, model solutions and implement them, and thus build individual, collective and relational agency reflexively. Observation of this required micro-analysis of agentive talk and reflective talk.

The study contributes in-depth insight into participatory research and learning processes, especially within the context of people-centred learning and innovation in the agricultural development arena. It provides empirical and explanatory insight into how change oriented social learning can emerge and be expanded in Education for Sustainable Development, explaining learning and change relationships in three sustainable agricultural practices. It also provides learning and extension tools to work with contradictions that arise from intentionality, experience, context and history in farming and training activity systems. Its key contribution lies in providing in-depth insight into mobilisation of human agency and reflexivity in change oriented sustainable agriculture learning and development, processes that are critical for responding to contemporary socio-ecological issues and risks.

Declaration

I declare that this thesis is my own work, and that all other sources used or quoted have been fully acknowledged and referenced. It is being submitted for the Degree of Philosophy at Rhodes University, and has not been submitted for a degree or examination at any other university.

Mutizwa Mukute

Signature.....

January 2010

Acknowledgements

I am grateful to farmers, sustainable agriculture facilitators, and organic agriculture entrepreneurs in the Schools and Colleges Permaculture Programme of Zimbabwe, in particular those of St Margret Primary School and community in Hwedza district; the Isidore Organic Community of Practitioners who became the Green Growers Association in Durban, South Africa; and Machobane Farming System in Mafeteng and Mochale's Hoek, Lesotho with whom I researched in this study. I am also grateful to government extension workers, environmental educators, and NGO leaders who took part in this study. Through my interaction with these groups of research participants, I came to know more about sustainable agriculture, how it was being learnt and how its learning and practice could be improved.

Thank you to my supervisor Professor Heila-Lotz-Sisitka for your insightful guidance and tireless support which included reading a number of drafts and providing some of the readings. I am grateful to my co-supervisor Professor Rob O'Donoghue who challenged me to seek a more nuanced and sophisticated understanding of education. My supervisors provided an enabling environment for cultivating scholarship. There were many critical friends in my research journey who each played meaningful roles: Professor Yrjö Engeström of the Centre for Activity Theory and Developmental Work Research and his colleagues Professor Jaakko Virkkunen and Marianne Teräs (PhD), Hanna Toiviainen (PhD), Annalisa Sannino (PhD), Professor Jarkko Hautamäki and Auli Pasanen for the insightful comments on my work, the literature provided and for hosting me for about a week during my academic visit in Finland. I also wish to acknowledge the input of Professor Peter Sawchuk of the University of Ontario for giving me audience during the Sixth Conference on Work and Learning held in Copenhagen and for sharing his insights and sending me literature on workplace learning. Professor Stephen Billett also helped me with a set of his publications after our conversation at the same conference. I also had a wide range of critical friends, some who made their comments at the beginning of my research journey, others at the end, and a few throughout the journey. These include John Wilson, Tafadzwa Marange, Walter Mugove Nyika, Chris Masara, Karen Ellery, Yvonne Nsubuga, Soul Shava (PhD), Muchaiteyi Togo (PhD), Kudzai Chatiza (PhD) and Letla Mosenene. Fellow students Elizabeth Motsa, Nta Silo, Lausanne Olvitt and Ingrid Schudel helped me with useful comments during Friday meetings and PhD weeks. I am also indebted to Hupenyu Lily Masvikeni, Gladys Tyatya and Khululwa Gxekwa who transcribed some of my work and to Lefa Sekete for translating most of the Sesotho conversations with farmers. I am grateful to Messrs Taurus and Kudakwashe Mukute and Chris Masara for video recording some of the proceedings of Change Laboratory Workshops. I thank Kim Ward for editing my thesis

during the festive season and for her thoroughness in doing so. Administrative and logistical support from Varonique Sias and Michelle van de Merwe was particularly efficient and was offered with warmth.

The South African Qualifications Authority generously provided the scholarship that enabled me to do the studies for which I am grateful. In addition, I thank Isaacs Samuel, Jeffy Mukora (PhD) and Heidi Bolton who made useful comments during the five presentations that I made at the Rhodes University-SAQA seminars. Through the research programme I was able to profit from engagement with Professor Ian Moll of the University of Wits and Alan Ralph from University of Western Cape Town. Mampho Thulo, Director of the Rural Self Development Association, provided me with free transport to conduct field work in two districts of Lesotho; Brett Muller and thank you also to his family for hosting me in Durban; and Samuel Hwande for letting me work with the Schools and Colleges Permaculture Programme in Zimbabwe.

Finally, I thank my family for allowing me to spend so much time away from them: my wife Chiramwiwa for holding the fort and supporting me intellectually and emotionally throughout my research journey; and our children Innocent, Tonderai, Farai, Takaendesa, Shamiso Tariro, Kudzai, Tinotenda and Takunda, for continuing so well with their domestic and school work during my absence. Finally, I thank my mother Marian for cultivating in me a certain level of grit and my late father Takaendesa for his many words of wisdom.

Dedication

This thesis is dedicated to contemporary, past and future generations of farmers.

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Acronyms and Abbreviations

AGRISETA	Agricultural Sector Education and Training Authority
AIDS	Acquired Immunity Deficiency Syndrome
AU	African Union
CAADP	Comprehensive Africa Agriculture Development Programme
CGIAR	Committee of the Consultative Group of International Research
CHAT	Cultural Historical Activity Theory
CL	Change Laboratory
DAO	District Agriculture Office
DWR	Developmental Work Research
ESAFF	East and Southern Africa Small Scale Farmers' Forum
ESD	Education for Sustainable Development
ETC	The Action Group of Erosion, Technology and Concentration
FAO	Food and Agricultural Organisation
FiBL	Research Institute of Organic Agriculture
GMOs	Genetically Modified Organisms
HIV	Human Immuno-deficiency Virus
IAASTD	International Assessment of Agricultural Science and Technology for Development
MADF	Machobane Agricultural Development Foundation
NEPAD	New Partnership for Africa's Development
IFOAM	International Federation of Organic Agriculture Movements International Trade
IFPRI	International Food Policy Research Institute
IIRR	International Institute of Rural Reconstruction
ILUD	Integrated Land Use Design
INR	Institute of Natural Resources
ITC	International Trade Centre
IUCN	International Union of the Conservation of Nature and Natural Resources
MAFS	Ministry of Agriculture and Food Security
MDGs	Millennium Development Goals
MFS	Machobane Farming System
NGOC	Non-Governmental Organisation Committee
NGO	Non-Governmental Organisation
ORAP	Organisation of Rural Associations of Progress
PELUM	Participatory Ecological Land Use Management Association

PROLINNOVA	Promotion of Local Innovation
PTD	Participatory Technology Development
RSDA	Rural Self Development Association
SADC	Southern African Development Community
SAQA	South African Qualifications Authority
SCOPE	Schools and Colleges Permaculture Programme
SSA	Sub-Saharan Africa
UNCED	United Nations Conference on Environment and Development
UNDESD	United Nations Decade of Education for Sustainable Development
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organisation
US	United States
WCED	World Commission on Environment and Development
WSSD	World Summit on Sustainable Development
WWF	Worldwide Fund for Nature
ZESA	Zimbabwe Electricity Supply Authority
ZPD	Zone of Proximal Development

CHAPTER 1: An Introduction to the Study

1.1 PERSONAL HISTORY AND MOTIVATION

My motive for conducting research into workplace learning in sustainable agriculture is informed and inspired by my social and professional background. My professional work, spanning two decades, has been concerned with agro-ecological management, with an interest in sustainability. I am interested in sustainable agriculture because it seeks to address the „triple bottom line of development“ taking into account people, economy and the environment. In addition it builds on local resources, to which even poor people have some access. Such an approach to development has the potential to enhance farmer self-reliance and resilience, while at the same time reducing farmer dependence on transnational companies. Given the trends in climate change and the increased frequency of droughts in southern Africa where the study is located, sustainable agriculture can play an increasingly important role in the mitigation of the associated negative impacts, while at the same time helping farmers to adapt to changing situations.

Having grown up in a communal farming area in Hwedza, Zimbabwe, I have had long exposure to, and interest in smallholder agriculture. The communal area has relatively low agricultural potential because it is dominated by sandy loam soils and receives seasonal rainfall of less than 750 mm per year, which appears to have become less and less over the years. Hwedza district was demarcated by the colonial government to settle the local people when better land was allocated to settlers during the early part of the 20th century. Before doing my primary education I remember that the village had two main areas, the grazing land to the west of the village and the fields to the east. This has changed partly because some of the grazing land has been allocated for settlement as the village population grew. At the same time much of the village’s traditional fields were last cultivated in the late 1970s and thorny trees have gradually established themselves, succeeding the annual weeds and making it difficult for grass to grow, thus limiting the amount of grazing available. The increase in population has not been accompanied by an expansion in land under cultivation.

To get to the traditional fields we would walk about two kilometres and cross a perennial river which has since become seasonal, perhaps because of the more frequent droughts, perhaps because not enough of the rainfall is infiltrating into the ground to recharge the water table. Next to the river my grandparents had a garden which they later shared with my parents. In this river, as boys, we used to fish during most of the year, now there are hardly any fish left. As a boy I witnessed rains between one summer season and another and these have special names in my language (Shona), but these rains hardly come nowadays. We

experienced *mavhurachando* – the rains that open the way for cold to come, in June; *gukurahundi* – the rains that clear millet or sorghum chaff, in August; *bumharutsva* – the rains that come soon after bush and veld fires, in September and *mvumiramutondo* – the rains that come soon after deciduous plants sprout new leaves, in September. The Shona word for August rains suggests that small grains were an important and staple food in the Shona culture.

My grandparents had a *hozi* in which they stored their grains and nuts that would last for more than a year. They grew finger millet, cowpeas, roundnuts sweet cane, sweet potatoes, groundnuts, maize, pumpkins, okra and many kinds of traditional vegetables. They dried some of the vegetables for use during the dry season. When my father's generation took over most of the farming from their aging parents, small grains were replaced by maize; drought-tolerant cowpeas were gradually replaced by beans and open pollinated maize varieties were replaced by hybrid seed which required chemical fertilizer in order to grow well. Whereas my grandparents' generation and those before it saved, improved and multiplied their own seed, my father's generation seldom did and instead relied on seed from companies which they had to buy every season – if they could afford them, otherwise they replanted what was there. Over the last thirty to forty years, the *hozi* gradually disappeared from the village landscape and there are few today. Farmers harvest and sell, keeping only food that will take them to the next growing season whereas in the past, there would be plenty to tide them over a number of bad agricultural years. Today, when there is a bad season, villagers have no reserves.

I learnt how to plant different crops through observing and doing. I learnt to weed and to plough mostly by doing. Before I started my primary school education, I used to have a „small field“ of about four square metres on the edge of the field that was at our homestead where I planted different kinds of crops and never harvested because they were too crowded. One year, I roasted maize seed, planted it and was very disappointed when it did not germinate, because I wanted to harvest a crop that was already roasted! During my primary education, there were sets of skills that I learnt from my grandfather and my father: how to plough, make mats from reeds, make „nests“ for hens and hunt small game. From peers I learnt how to swim and herd cattle. From my grandmother and mother, I learnt how to select tender leaves from pumpkin plants and cowpeas for cooking, sow seed, to cook, sweep and wash my clothes and to tell tales. As a boy, I do not remember meeting an agricultural extension worker although I heard about them.

After completing my primary school education, I proceeded to do secondary education and one of my subjects was agriculture but for some reason the school was not registered to sit exams in agriculture. But I had learnt something in spite of the absence of accreditation.

Later, my academic, professional and work experiences exposed me to natural resources management, including agricultural practices, some of which will be discussed later in the thesis. My professional growth and development occurred in and through work. The work environments, policies, principles and objects of the organisations that employed me shaped my learning and practice and over the years there was a growing pattern of reflexivity, dialectics and agency. It is these three epistemic ideas that provide the argumentative grammar in this thesis or “epistemic idea or threads that run through and connect theory, methodology and empirical research in any serious research approach” (Engeström, 2008, p. 13). Between 1988 and 1991 I worked in natural resources management as a national parks and wildlife officer. While one of my primary roles was to ensure preservation of protected areas, I was also engaged in extension work which sought to encourage people to appreciate nature and natural resources. One of the greatest challenges was to convince ordinary people of the need for conservation of resources that they did not benefit from. Often those people who lived near parks had to contend with wild animals straying into the fields, destroying their crops and there was no compensation for this. In a sense, they bore the costs and did not access the benefits. Between 1992 and 1995 I worked as a researcher/writer with a regional Non-Governmental Organisation (NGO) that covered southern Africa and I was responsible for compiling articles on such themes as protected areas, armed conflict and the environment, and marine resources. I co-authored the first State of the Environment Report covering southern Africa and this process exposed me to big issues faced in sustainable development, as well as to regional issues. It also created opportunities for me to appreciate some of the ignored ingenuity of traditional knowledge. My first deep engagement with issues of learning and the environment occurred from 1995 when I joined a regional network of agro-ecological organisations working in east and southern Africa called Participatory Ecological Land Use Management Association (PELUM). One of my assignments was to coordinate the development of an agro-ecology and community development curriculum and to establish a college to implement this in Zimbabwe. By then I had tertiary qualifications in natural resources management and in training. Preliminary work had already been done in terms of the scope of the curriculum. In essence, my task was to ensure the further development of this into a coherent curriculum. The curriculum sought to „produce“ a well-rounded graduate in community development; someone who had agricultural, ecological, social and economic knowledge and skills. This was the beginning of my working consciously and deliberately with dialectical matters. The strategy we used for the implementation of the curriculum was the idea of a „college without walls“. The idea was to use existing infrastructure among those organisations that would take part in implementing the curriculum in Zimbabwe. What was realised from the beginning was that there was not enough capacity among PELUM member organisations and other NGOs, to implement such a curriculum. So partnerships were sought with the government agricultural extension branch, two universities and one forestry college. Bringing people from these different institutions to work on the curriculum and later to

implement it required that I work with people with different educational and development backgrounds and orientations and different work ethics. This was in fact a process of interagency, a form of boundary crossing. In developing and implementing the curriculum, we were guided by action learning which has a strong reflexive component. Outside the mainstream of events which involved all the participating institutions in the college, one of the key reflexive contributions that I made to the college was writing my Masters in Education half-thesis based on evaluating the curriculum development and implementation process (Mukute, 2001). During this period I learnt many things „on the job“ and through short courses. I attended short-term courses in Permaculture, Participatory Rural Development, Gender and Development, and Advocacy. I also attended longer courses in Holistic (Resource) Management and Environmental Education. In 1999 and 2000 I completed a Masters in Environmental Education.

Between 1998 and 2005, I ran PELUM. During these seven years, I was exposed to numerous dialectical matters. I realised that I needed to ensure that we balanced the interests of different countries that were members of the association. This was not always easy because some of our donors wanted their money to be spent on specific countries. When the organisation was launched in 1995 its main thrust was „facilitating learning and networking“; four years later it decided to include an advocacy dimension because the policy space seemed to be stifling what we sought to achieve with technical knowledge and skills development. This created another tension in my work: how to balance time, funds and human resource inputs between advocacy and service activities. The addition of advocacy also reflected how the organisation (and I) attempted to be reflexive, considering the context regularly and responding to it, sometimes even pre-empting change. The other programmes introduced by PELUM were gender and development; seed security for food security; and research and development. One of the dialectical issues in research and development was concerned with the extent to which the organisation encouraged farmers to go to research stations and choose what they needed from available research products on one hand, and influence the research agenda of those research institutions on the other. This debate was never quite resolved but we tried to do both. I was involved in two international developments that also helped inform the organisation. I became a member of the NGO Committee of the Consultative Group of International Research (CGIAR) and I learnt about the potential opportunities and dangers of bringing farmers and conventional researchers together. In 1999 I was part of the pioneering team that met in France to discuss how farmer innovations could be documented, supported and shared more widely. Today through subsequent efforts of which I was not part, there is an organisation called Promotion of Local Innovation (PROLINNOVA) that exists to document and promote farmer innovations in Africa, Asia and Latin America. For my organisation this process helped us to identify farmer innovators in the region and find creative ways of documenting what they were doing. Facilitating this process helped me to

appreciate how much „ordinary people“ were doing. It was through this process that I got to know more about the Machobane Farming System which is one of the three case studies in this research. In an editorial of *Ground Up* (our regional magazine), I wrote of this process:

In this issue, we highlight the beautiful and celebrate some of the many achievements of smallholder farmers. We navigate the hills and valleys of the region, showing you the power of the farmer’s mind when things get tough, when opportunities arise and when the pleasure of discovery attends development ... Sharing experiences gives other people ideas to solve their own problems. (Mukute, 2002, p. 2)

When I was contemplating leaving the organisation around 2002, the PELUM Board asked me to document and share my experiences in the organisation for the benefit of members, staff and other NGOs. This culminated in the production of a book entitled *Tracing PELUM’s Developmental Journey: Experiences and Lessons from an African Regional NGO Network*, which shared not only the history and the context of the organisation but also the lessons (reflexivity) learnt. In the book I devoted a chapter to tensions that I experienced in the organisation and how we resolved some of them: “Tensions visit organisations and they can be harnessed creatively and constructively ... Tensions can serve as clues of what needs attention and change. As PELUM Association grew and developed, many tensions of different nature arose” (Mukute, 2004, p. 30). Some of the tensions that I discussed were related to: working with and working through others; the autonomy of country chapters of PELUM and their interdependence with others; the fear of cooption and hope for authentic engagement in the area of advocacy; time to do and time to reflect; advocacy and service provision. In essence I was discussing contradictions, and their potential for triggering expansive learning in the PELUM Association activity system as potential sources of learning and development – tensions that „visited“ and those that „arose“ from within.

For me perhaps one of the most profound dialectical issues that we managed to handle effectively was the question of whether farmers and their organisations should become part of PELUM Association or be assisted to establish their own local organisations. The PELUM General Assembly of 2001 decided to help organise smallholder farmers involved in sustainable agriculture to speak for themselves because PELUM, as a regional network of networks of NGOs, had no legitimacy to speak on their behalf. Consequent to this decision it was agreed that member NGOs should identify farmers in farmer groups that they were working with and that such farmer representatives should be supported to attend the World Summit on Sustainable Development (WSSD) held in South Africa in 2002. We partnered with the *Institut Africain de Developpement Economique et Social* and Network of Organic Farmers in Africa so that we could also involve other countries in Africa. In the end, we were able to bring together 300 farmers and development facilitators to attend the farmer convergence in South Africa in 2002. The process culminated in the formation of the East

and Southern Africa Small Scale Farmers“ Forum (ESAFF) which has offices in Tanzania and has national chapters operational in countries such as Kenya, Uganda, Zimbabwe, Zambia, Lesotho and Tanzania. In essence, PELUM was helping farmers to develop their own agency to influence policy at national, regional and international levels. As part of supporting the organisation to grow and stand on its own, we invited people who had experiences in working with farmer associations to help the farmers and us to conceptualise their forum. One of the most useful presentations in this regard was prepared by Lassalle, a lecturer from South Africa“s University of the North and Mgumia, a lecturer from Sokoine University of Agriculture, Tanzania on the *Morphogenesis of farmer groups and organisations*. The presentation linked the changing nature of the role of farmers and farmer groups from the past to the future and explored how this would impact on their relations with stakeholders such as PELUM and its member organisations (Mgumia & Lassalle, 2003). The presentation exposed me to the notion of structure and agency as propounded by Archer (1995, 1998).

Now looking back at my ten-year journey in PELUM I realise how, as an organisation moving from what we called the pioneer phase, to the bureaucratic and later to the mature phase, it was becoming a more advanced activity system (see Section 3.6.4). When PELUM was launched, it focused on how subjects could address their objects using available conceptual tools – focusing on learning and networking among farmers and development facilitators. However, as time went on, it took more notice of contextual factors such as the social and economic laws that undermined the educational/developmental interventions we were making, thus taking into account the rules dimension of activity systems. A further analysis of the situation revealed that farmers whom we worked with as subjects were probably better seen as a different and autonomous activity system that PELUM could work with, around a shared object. The PELUM General Assembly decision to support the creation of a farmers“ organisation resulted in the establishment of a separate activity system that had a shared objective with that of PELUM. Lassalle implies growing understanding of a changing PELUM activity system when he comments on the book I wrote about PELUM: “I enjoyed reading this book that has brought me a new light about the PELUM planet, the PELUM solar system, the PELUM galaxy” (Mukute, 2004). When I left PELUM in 2005 I went into consulting and largely worked with development NGOs and farmer organisations. This included research on “The potential impact of terminator technology on smallholder farmers” and “Gender and the agrarian reform in Zimbabwe”. Although I enjoyed the assignments, I realised that I was moving into new area, requiring a new set of skills and when the opportunity for further studies arose, I seized it and this led to my conducting this research. This should help to enhance my agency in future work.

It is against this background that I, as a reflexive promoter of sustainable agriculture and natural resources management in east and southern Africa, with a professional background in natural resources management, education and training, set out to explore how farmers were learning and practising sustainable agriculture so that we could jointly find ways of expanding their learning and practice of sustainable agriculture (see Section 1.5). Rickinson, Lundholm and Hopwood (2009) argued that there are three ways that have been used to research environmental education: researching learners, measuring outcomes and exploring processes. They further argued that researching learning processes has become more prominent in recent years (Rickinson, Lundholm & Hopwood, 2009, p. 28). This study intends to generate further insights into learning processes. The focus on exploring learning processes in the study allows the voice of the learner, in this case the farmer and to an extent, the trainer of the farmer, to be heard, enabling the multiple ways of learning to be articulated (ibid.). More importantly the insights on learning processes have enabled expansion of learning processes, which is the second and major interest of the study. This means therefore that what is potentially new about this study in environmental education is its deliberate intention to expand learning processes, thus continuing to further knowledge of learning processes.

1.2 RESEARCH CONTEXT

People are always learning. They learn from observing others; they learn from their parents; they learn from media; they learn in the workplace; they learn through their own life experiences. Non formal learning providers support this “everyday” learning by offering structured and free-choice opportunities for people to explore ideas, to satisfy curiosity, to gain information and skills, and to improve their quality of life. The goal is to identify ways that biodiversity is being explored by these communities and encourage sharing of experiences. (UNESCO, 2009, p. 2)

The United Nations Educational, Scientific and Cultural Organisation (UNESCO) has been and is one of the main UN organs that promotes learning associated with sustainable development. The United Nations Conference on Environment and Development (UNCED) of 1992 produced practical recommendations on education, training and public awareness in Agenda 21, which were endorsed by 171 national government delegates. The 2002 World Summit on Sustainable Development (WSSD) held in South Africa endorsed Agenda 21 and further recommended a United Nations Decade of Education for Sustainable Development (UNDESD) for the period 2005-2014 and this was adopted by the United Nations (Lotz-Sisitka, Gumede, Olvitt & Pesanayi, 2006a) with UNESCO as the lead agency. The goal of the UNDESD is to integrate values, principles and practices of sustainable development into all aspects of education and learning towards environmental integrity, economic viability and a socially just society for present and future generations (UNESCO, 2005). One of its four objectives, which is of interest to this study, is the use of education for sustainable

development towards the achievement of UN Millennium Development Goals (MDGs). This study seeks to address two MDGs: MDG 1, which is concerned with reducing hunger and poverty and MDG 7, which seeks to ensure environmental sustainability in the context of poverty, risk and vulnerability (Lotz-Sisitka et al., 2006a), which makes sustainable agriculture an important part of the solution. In a separate and related document Lotz-Sisitka et al., (2006b) also point out that some of the participatory learning processes going on in southern Africa include experiential and workplace learning. In yet another report, they argue that indigenous, traditional and local knowledge should be recognized as a key strategy in ESD (Lotz-Sisitka et al., 2006c). This study is interested in how farmers learn and adapt to new and emerging problems by building on their everyday knowledge. Sustainability is a process of change and this means that in order to enhance sustainability in agricultural workplaces, there is a need to engage in processes of transformation through work and reflection done iteratively, that is, praxis. The building of resilience implies that one has to look for local ways in which farmers' capacity to adapt to changing circumstances is bolstered. This can be associated with the concept of using different kinds of knowledge together such as „everyday“ and „scientific“ or endogenous and referential knowledge (Delanty, 2005) to overcome challenges, which calls for reflexivity. “A system is reflexive if it applies something it has learnt from its environment to its own internal working” Fuller (1993, in Delanty, 2005, p. 141). The need to manage different and often competing interests of the environment, economy and social equity requires dialectical approaches to sustainability because these several spheres of development come with different knowledge, perspectives and voices, which generate solutions and knowledge through dialogue, joint reflection and action. The South African Sustainable Development Framework was built on the three interdependent pillars of people, planet and prosperity (Department of Environment & Tourism, 2008, p. 6). Wals, van der Hoeven and Blanken (2009) made the important observation about why the P for „profit“ was changed to „prosperity“ in sustainable development discourse:

The „P“ of profit has quietly become one of the pillars of sustainability whereas more and more people are of the opinion that a key to sustainable development is not the capacity for economic growth, but rather for *restricting* the capacity for economic growth. More and more we often can observe the „P“ of profit being replaced by the „P“ of the more inclusive „prosperity“. (p. 7)

There is little research on ESD, workplace learning and sustainability practices in southern Africa (Lotz-Sisitka, 2008a). Consequently, little is known about „on the job“ and social learning associated with sustainability practices in the workplace (ibid). Given the uncertainties associated with climate change and agriculture, especially in southern Africa where changing weather patterns have already posed risks, there is need to develop or enhance learning processes that proactively address new challenges and risks (see Sections

2.2 & 2.2.3). This is particularly important given that ESD research in southern Africa has had little focus on learning processes that are shaped by risk epistemology in the workplace outside of the Human Immuno-deficiency Virus (HIV) and Acquired Immunity Deficiency Syndrome (AIDS) pandemic (Lotz-Sisitka, 2008a). This study intends to address this gap in the field of environmental education. More specifically, the study is informed by the understanding that:

- In southern Africa, workplace skills planning processes have not been adequately informed by work-based learning needs that would strengthen sustainable development practices and service delivery (Lotz-Sisitka et al., 2005). The study will explore the learning of sustainability in the workplace, with a view to understanding the learning processes.
- Ambivalence, ambiguities, tensions and contradictions that emerge from environmental issues can produce learning opportunities (Wigley, 2006, Pesanayi, 2008). It is through looking into these dissonances (Wals, 2007; Wals & van der Leij, 2007), that this research seeks to expand the learning processes that take place in sustainable agriculture workplace contexts.
- Risk, inter-generational learning and cultural familiarity influence learning interactions in communities of practice, including those in the agricultural sector (Pesanayi, 2008). This underlines the importance of culture and history in understanding and supporting learning processes. The history and contexts of farmers will form an important part of trying to understand and subsequently address some of the issues that farmers are facing in learning and practising sustainable agriculture.

This research project was conceptualised as part of a wider research partnership programme launched by the South African Qualifications Authority on *Researching Work and Learning* in South Africa. Rhodes University established a research partnership with the South African Qualifications Authority (SAQA) to develop deeper understanding of work and learning (Mukute & Lotz-Sisitka, 2009a). The research project set out to consider epistemologies of change oriented workplace learning in sustainable agricultural settings in southern Africa. The objectives of the Rhodes University and SAQA programme (Lotz-Sisitka, 2008a) were:

- Developing conceptual understandings of how change and adaptation processes occur in and through workplace learning, thus deepening knowledge of workplace learning;
- Developing new knowledge of sustainable development practices and how they „play out“ in workplaces and contribute to a critical understanding of such practices; and
- Enhancing understanding of the learning–development practices relationship.

In a related discussion, Lotz-Sisitka (2009a, p. 351) pointed that “sustainable development cannot occur without change oriented workplace learning (with associated professional

development), given its cross-sectoral, dynamic and multidimensional nature”. Lotz-Sisitka concluded that “ongoing reflexivity is needed in seeking new and better ways of responding to the complexity of sustainable development” (2009a, p. 354).

1.3. RESEARCH FOCUS

My research interest had two main motives: to understand how farmers are learning and incorporating sustainability practices in agriculture; and to look for ways to enhance the learning of farmers. The nature of the research focus compelled me to work with farmers who practise sustainable agriculture. In looking for them, I had to consider what was possible given my history and background. Having worked with numerous NGOs and farmers in eastern and southern Africa and having spent time in various parts of the region, I was reasonably exposed to the agricultural practices, people, places, problems and prospects therein. Consequently, I developed a sense of place for the region which means “rootedness in one’s community and the desire to cherish and cultivate one’s local community” (Bauch, 2001 in Barter 2007, pp. 59-60). Some of the sustainable agriculture practices in southern Africa are Permaculture; Organic Farming; the Machobane Farming System (MFS); Agroforestry; Holistic Management; and Conservation Farming (Wilson, 1999; Mukute, 2001). The differences in sustainable agriculture practice largely lie in emphasis.

I decided to work with three of these agricultural practices so that I could develop a deeper and wider understanding of learning processes of related and similar agricultural practices in different contexts with different histories. The idea was not to produce standardized solution packages but to develop new concepts around learning and agency of the farmers. I chose Permaculture, Organic Farming and the Machobane Farming System (MFS) because of their relative high prevalence in Zimbabwe, South Africa and Lesotho, respectively. I worked with the Schools and Colleges Permaculture Programme (SCOPE) in Zimbabwe which had been in operation for 15 years, focusing on a school and its community which had implemented Permaculture since 1994. The introduction of Permaculture in schools and colleges where the mainstream curriculum was built on conventional agriculture and the agricultural policies of the country created structural tensions which are still being grappled with today (see Section 6.3.2.1). This programme was considered an appropriate programme to study in this workplace learning research study since, although being located at schools, it provides a centre of learning for farmers, and involves agricultural extension staff. Schools often provide important centres of learning in rural community contexts, and as such were considered appropriate for a study on workplace learning for farmers in a southern African context. In South Africa I worked with Isidore Organic Farm and its community of organic producers and a marketing company, Earth Mother Organic. Isidore provides organic farming consultancy and free training to poor groups of farmers. In Lesotho I worked with two NGOs that promote the MFS and both have been doing so for at least 15 years. One is a foundation

set to promote the ideals of the MFS and its founder and is called the Machobane Agricultural Development Foundation (MADF) and the other is called Rural Self Development Association (RSDA).

The MFS is an intensive crop farming system that uses crop rotation, relay cropping and intercropping while at the same time enabling and optimizing soil and water conservation, (Robertson, 1994; IIRR, 1998; Pretty; 1999; Machobane & Berold, 2003). The five basic principles of the MFS are: using organic fertilizers, which are locally produced; ensuring perennial vegetation cover; having a cropping pattern that is adapted to the seasons of the year that includes nitrogen fixing legumes, cash crops and food crops; natural pest control and preservation of natural pest eaters; and relay cropping that ensures continuous harvesting from the same piece of land during most of the year (Mosenene, 2000; Grandin, 2001). Permaculture is an integrated land use design system that can be applied to create and maximize beneficial relationships between and among different elements of a landscape (Mollison, 1991). Bill Mollison, who developed Permaculture, adds that it “is based on the observation of natural systems, the wisdom contained in traditional farming systems, and modern scientific and technological knowledge” (Mollison, 1991, p.1). The principles of Permaculture include external input minimisation and energy efficiency; synergetic interconnections of biological and physical components in the system; working with nature not against it; recycling and re-using; enhancement of biological diversity and taking the long view to foster sustainability (Mollison, 1991; SAFIRE & UNHCR, 2004; SCOPE, 2004; Mukute & Marange, 2008). Organic farming is a form of sustainable agriculture that refers to the way farmers raise and process food, which should be free of chemicals such as fertilizers, pesticides, herbicides and growth hormones (Clark, 2007). It is based on organic methods of fertilizing the soil and controlling pests while at the same time improving the soil’s capacity to hold water, nourish soil life and therefore plant life (IFOAM, 2005). Organic agriculture relies on biological processes, which are renewable and non-polluting, adhering to the principles of health, ecology, fairness and care (Organic Agriculture Centre homepage, 2008). Its associated pest management emphasizes preventive measures such as pest predators, crop rotation and integrated pest management. Healthy food is an important aspect of organic farming.

1.4 RESEARCH OBJECTIVES

This study had an explicit intention to understand how learning in agricultural workplace contexts takes place in relation to sustainability issues and how such learning can be enhanced. It was concerned with researching complex changing activity systems, how learning takes place in them and how different activity systems interact and influence learning and practice.

The research objectives were to:

- a. Investigate learning processes that expand the current scope of sustainable agriculture practices; and
- b. Develop mediation tools that support expansive learning of sustainable agricultural practices.

1.5 RESEARCH QUESTIONS

The following research questions have guided the study:

- a. How do farmers learn about sustainable agriculture in their workplaces?
- b. What are the current limitations and contradictions of sustainable agriculture learning processes among farmers?
- c. How can sustainability be better learnt and more reflexively practised in the farmer's workplace?
- d. What conceptual artefacts can the study develop to support expansive learning for sustainability in farmers' workplaces?

The research intended to contribute towards better understanding of how farmers learn about sustainable agriculture as well as to improve how they could learn and create new knowledge in the process. It also intended to contribute to the SAQA research programme on how learning takes place in workplace contexts so as to make learning more conscious, effective and reflexive in the context of sustainable development. But perhaps most importantly for research participants, the research intended to contribute to the development of reflexivity, resilience and agency among farmers and their development facilitators.

1.6 THREE SENSITIZING CONCEPTS

I think that thoughtful study shows conclusively that the concepts of our discipline are fundamentally sensitising instruments. Hence I call them „sensitising concepts“. A sensitising concept ... gives the user a general sense of reference and guidance in approaching empirical instances. Whereas definitive concepts provide prescriptions of what to see, sensitising concepts merely suggest directions along which to look. (Blumer, 1954, p. 7)

Blumer (ibid.) argued that it was necessary, in social science where definitive concepts are difficult to find, to work with „sensitising concepts“ in orienting research. In this study I worked with three sensitising concepts which weave together the theoretical framework, the research questions and the research process. The sensitising concepts are dialectics, reflexivity and agency and are discussed below in Sections 1.6.1 to 1.6.3.

1.6.1 Reflexivity

Reflexivity refers to self-transformative capacity (Delanty, 2005, p.120) and in the context of this study it means the ability of people in the workplace to develop their own capacity to

reflect on, review and change in response to contextual factors and improved understanding of practice (SADC REEP, 2002). Reflexivity also involves “the use of knowledge to generate further knowledge” (Delanty, 2005, p. 120). It makes a connection between knowledge, thinking and acting (ibid.). Abercrombie, Hill & Turner (2006) defined three aspects of reflexivity: the ability to look into oneself; to examine own practice and change it; and the ability to reflect on and talk about the social world. Beck’s reflexive modernisation is tied to knowledge on foundations, consequences and problems of modernisation processes – which is also essentially linked to unintended consequences of modernisation, as well as unawareness (Beck, 2000). He defines unawareness as not-yet knowledge, or no-longer knowledge, which is essentially potential knowledge (Beck, 2000). When Giddens talks of institutional reflexivity he is referring to the development of knowledge rather than to „disembedding“ and „re-embedding“ which means employing knowledge to change structures and social forms of action (Beck, 2000). Wals and van der Leij (2007) likened reflexivity to cognitive competence, and noted that “cognitive competencies can only realise their full transformative potentials when they are embedded farther in a further development of social capital and social as well as emotional competencies” (p. 25). Wals et al. (2009, p. 9) described a reflexive society as one that “has the capacity to lay existing routines, norms and values on the table, but also has the ability to correct itself. A reflexive society requires reflexive citizens who critically review and alter everyday systems that we live by and that we often take for granted”.

In the context of this study reflexivity involves capacity to continuously and strategically reflect on, review, and change in response to internal and contextual factors, leading to an improved understanding of practice (SADC REEP, 2002). I was interested in finding out how everyday experiences could be reflected on so as to consciously build new knowledge to address agricultural concerns through assisting research participants to examine their learning and practice. This involved iterative learning, acting and reflecting along an expansive learning path as research participants navigated across their jointly defined zones of proximal development. My research journey was also informed by reflexivity in that I continuously sought to expand my horizons and capabilities as a researcher (see Section 4.8).

1.6.2 Dialectics

The Oxford Advanced Learners’ Dictionary defines dialectics as a philosophy of discovering the truth of ideas by discussion and logical argument and by considering ideas opposed to each other (Wehmeier, McIntosh, Turnbull & Ashby, 2005). Abercrombie et al. (2006, p. 107) explained dialectics as “the view that development depends on the clash of contradictions and the creation of a new, more advanced synthesis out of the clashes”. Dialectics is influenced by Hegelian-Marxist thinking and its development begins with assumptions that reality evolves from contradictions between antagonistic and non-

antagonistic forces (Gadotti, 1996). Macey (2000) outlined three laws of dialectics as: the law of unity and conflict, which states that all phenomena consist of mutually contradictory elements, and that change is a result of addressing their internal contradictions; the law of the transition of quantity into quality, which argues that quantitative change leads to qualitative ones; and the law of negation of the negation referring to the fact that the new order is negated again as contradictions arise and new solutions are sought. I used contradictions as potential sites for stimulating learning and growth as proposed in Cultural Historical Activity Theory (CHAT) (see Section 3.6.4). Two of the most important forms of tension identified in social learning, which this study also encountered, were between need and competence; and between conflict and cooperation (Wals & van der Leij, 2007, p. 22). Dean (2006) identified a strong connection between dialectics and agency in capitalism:

Capitalist forms of agency are different in character and more various than those in pre-capitalist cultures. They are different in that they involve transformation rather than reproduction of existing repertoires of action. What this means is that capitalism is impelled to transform rather than reproduce modes of subjectivity if it is to reproduce itself. (p. 140).

The discourse of sustainability within which sustainable development, and also sustainable agriculture are located, is built within the capitalism that Dean refers to above (see Section 1.7.4.2). In sustainable agriculture, it is necessary to constantly manage different and often competing interests of the environment, economy and social equity. In addition sustainable agriculture, being informed by both traditional and conventional knowledge systems, involves the coming together and possible clashing of different knowledges, perspectives and voices. This means that a suitable theoretical framework should enable me to both identify and work with contradictions.

1.6.3 Agency

“While philosophy seeks only to understand the world, the point is to change it” (Marx in Green, 2009, p.40). Agency is change oriented and can be perceived as the human will to act towards a given end in relation to something or some other people. It involves actors’ engagement with structures to reproduce or transform them. It entails that the actors who exercise agency “enter into relationship with surrounding persons, places, meanings and events ... a dialogic process by which actors immersed in the *duree* of lived experience engage with others in collectively organised action contexts, temporal as well as spatial” (Emirbayer, 1997, p. 294). Barnes (2000, p. 25) defined agency thus, “For an individual to possess agency is for her to possess internal powers and capacities, which, through their exercise, make her an *active* entity constantly intervening in the course of events going on around her” [emphasis in original]. These powers, according to Giddens in Barnes (2000), constitute the ability to make a difference by acting on or against external constraints and to transform the structures and systems from which they arise. Agency is therefore not passive.

Sibeon (1999, in Lewis, 2002, p. 17) explained agency as the „capacity to act upon situations“ and that agency is a property of actors, an actor in this sense meaning the individual, group or organisation with the capability to make and execute decisions. Archer (1995) argued that agency leads to morphogenesis of two kinds: that of structures and systems and that of the actors themselves. “Morphogenesis of agency produces yet another kind of morphogenesis, morphogenesis of actors. When the agents regroup, an elaboration of roles will take place. The number of roles which can be attributed to persons increase” (Zeuner, 2000, p. 81). The study also draws on Engeström’s (2008) notion of agency and links agency to causality built on interpretation and contradictions as the statement below reveals:

Eskola’s realistic paradigm focuses on the fact that humans do not merely react as physical objects; they act based upon their activities, interpretations and logics. For the sake of simplicity, we may [call] this, the interpretative layer of causality. But there is more causality in human contexts. Human beings not only interpret, they also face contradictions between multiple motives embedded in and engendered by their historically evolving communities and objects. This is the layer that makes human beings look irrational and unpredictable...This adds another layer to human causality. It is called the contradictory layer. What is still missing is the human potential for agency, for intentional collective and individual actions aimed at transforming the activity. Thus I complete the picture by adding an agentive layer. (Engeström, 2008, p 16)

The table below (Table 1.1) summarises the place of agency in human activity.

Table 1.1: Three layers of causality in human action

Interpretive layer	In the actor	Takes into account according to this and that logic	If X, then Y Rule, law
Contradictory layer	As participant in collective activities	Is driven by contradictory motives	Searching for resolution by often unpredictable actions
Agentive layer	As potential individual and collective agent	Takes intentional transformative action	Inventing and using artefacts to control the action from the outside

Source: Engeström, 2008, p 17.

Agency has intentionality and can be either an individual or a collective process. This study is change oriented and therefore designed to support the development of agency among research participants. It also covers the quality of partnerships that exist between persons. I also draw heavily on Engeström’s (2008, pp. 36-37) five forms of agency, namely:

- a. Resisting and intervention through criticism, questioning and rejection;
- b. Explicating new possibilities or potentials by, among other things, drawing from past positive experiences;

- c. Envisioning new models of the activity, which may come in the form of suggestions;
- d. Committing to concrete action (agentive talk), where the speaker expresses his/her intention to act in a specific way; and
- e. Taking consequential action to change the way things are.

In this study I use agency to refer to individual, collective and relational abilities to purposefully transform themselves, other people as well as the structures within which they live and operate – transformative power and creative action. This study is primarily interested in enhancing the agency of individuals and their communities to take responsible action and achieve dual forms of morphogenesis discussed by Archer (1995). This therefore meant supporting the development of individual, relational and collective agency. In addition the study worked with agentive talk by analysing how language was used during Change Laboratory workshops to prepare research participants to exercise agency (see Section 8.2).

1.7 KEY TERMS IN THE STUDY

There are five main dimensions to the proposed research study: learning; practice; workplace; sustainability and agriculture. This section is therefore devoted to exploring and explaining these five dimensions in order to locate the study in its context. In keeping with the theoretical framework of cultural historical activity theory (see Section 3.4) that I used in the research, I try to give a context that includes the history of each of these five aspects that shape the study. The concepts may be represented as shown in the figure below (Figure 1.1).

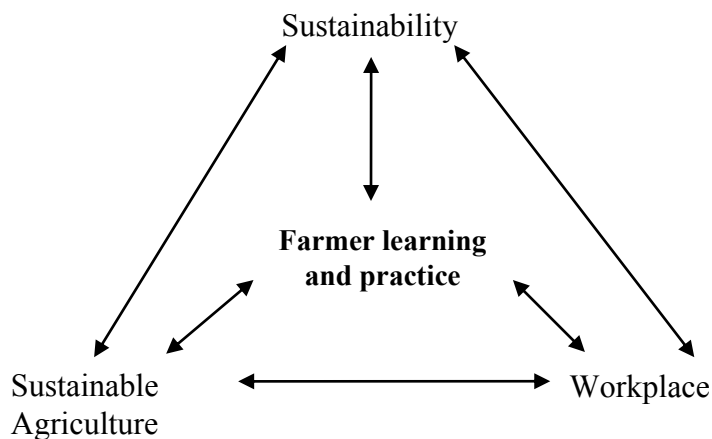


Figure 1.1: Key concepts in the study

1.7.1 Learning

Edwards (2005a) defined learning as a process concerned with within-in the person changes, which modify the way in which the person interprets and modifies the world: how the mind looks at the world, interprets it and acts on it. Greeno (1997, in Edwards (2005b) described

learning as acquisition of knowledge or participation in a set of activities. Drawing on the work of Rommetveit (2003), Edwards (2005b) found it useful to see learning as being concerned with knowledge about and the search for meaning, so that participation is seen as the search for meaning, and is not limited to behaviour. Engeström (1987), who also built on the work of Vygotsky and Leont'ev, proposed that learning is evident when an object is seen as more complex by the person acting on it because one can see more of it. For example, a farmer has learnt about the maize crop when he or she understands more about it. This could be in terms of knowing how to select the best cobs for seed, or knowing the requirements for its germination, or knowing how pollination takes place. Vygotsky's main contribution was that learning is not simply a cognitive phenomenon but also a socio-cultural one. Vygotsky talked of the notion of "turning" by which he meant the process in which the external social relations and socio-historical systems are transformed into mental actions, outcomes, and embodied states that are associated with notions of knowledge and skill. He developed the idea of learning as participation in social practice defined by dynamic transformations, change, and interrelationships with other social systems (Edwards, 2005a). Therefore learning can be seen as an inter-psychological or inter-mental process between individuals and social sources of knowledge. Learning that happens within the person is called intramental and is part of the internalization: the new learning that has been internalized will allow the learner to see the object of his or her activity differently and as more complex. This will then affect how one would relate with the object, thus externalizing what has been learnt, giving new meaning (Lave and Wenger, 1991).

Lave and Wenger (1991, in Edwards, 2005b) suggested three approaches to supporting learning: scaffolding interpretation, where a more knowledgeable other assists the learner to move to a new understanding; cultural interpretation, which is concerned with addressing the difference between everyday experiences and scientific understandings using instruction; and the collectivist/societal interpretation, which refers to the difference between "current understandings and new forms of collectively generated solutions to the contradictions embedded in the current understandings" (Edwards, 2005b, p. 5). Scaffolding and cultural interpretations of learning are concerned with internalization of the culture in which people are found using mediation tools. The collectivist/societal interpretation of learning is concerned with dealing with new problems thus emphasizing externalization and contestation of the object, and allowing people to see new problems and develop new solutions. It also fits in well with Engeström's idea of expansive learning, which is concerned with transferring and creating knowledge (Engeström 2001a, 2005, 2008; Warmington et al., 2005).

Illeris (2003, p. 170) explained learning as "All processes leading to permanent capacity change – whether they be physical, cognitive, emotional, or social in nature – that do not exclusively deal with biological maturation or ageing". He further argued that there are two

layers of interaction in learning: between the learner and the environment; and the inner mental processes of acquisition and elaboration, through which impulses of interaction are linked to earlier learning (Illeris, 2003, p. 170). He regarded “the dialectics between the social and the individual spheres as the most central feature of learning in work life” (Illeris, 2004, p. 440).

This research had an interest in the critical and therefore drew on critical pedagogy, which has the following three inter-related processes:

...transformative critique that conceives of knowledge as socially produced, legitimated, and distributed; recognition that knowledge expresses and contributes to particular material interests; and the active negation of the objective characterization of knowledge so as to reveal their relationship with power and control. (Sawchuk (2003, p. 35)

Sawchuk, who is concerned with workplace learning, identified critical pedagogy’s weakness as not covering workplaces. Paulo Freire’s pedagogy of the oppressed contributed to adult learning through the concept of conscientisation. It had a special interest in understanding relations of learning grounded in specific racialized, gendered, classed, and regionalized standpoints of the developing and developed worlds. This is firmly located in Marx’s revolutionary praxis (Sawchuk, 2003). One of the main criticisms of Freire’s work was that conscientisation is built on the idea of the enlightened other. Sawchuk (2003) noted that Freire’s work on conscientisation did not address the question of spontaneous self-learning, and collective forms of learning such as expansive learning.

The relevance of the above discussion to the study is that in workplaces, workers learn from each other and from their seniors and juniors through instruction and accompaniments. The learning is part of carrying out activities and is assisted by the use of conceptual and material tools that have a history and are embedded in culture. Workers also encounter new problems and seek solutions to them through individual and collective effort, from within and without the work environment, resulting in the collectivist interpretation of learning, which is expansive. One of the limitations of workplace learning, because it is often situated, is that it can be inherently conservative because it is confined to its own socio-cultural context and history (Glasser, 2007). There is therefore need to locate workplace learning in the broader macro-environment and the linkages that exist otherwise social learning will maintain „morphostasis“ (Archer, 1998) My research interest was transformative learning within the programme concept of sustainability and change-oriented learning and I watched out for *reproducing* the status quo.

In his book *Mind in Society*, Vygotsky (1978) discussed three main relationships between learning and development theories: development precedes learning; learning and

development are the same; and learning precedes and is related to development. He subscribed to the theory that learning leads to and is related to development and developed the notion of the „zone of proximal development“ which he explained as “the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers” (Vygotsky, 1978, p.86). Engeström (1987) took the notion of zone of proximal development further, beyond the individual to the level of an activity. In this study learning is used to denote intentional acquisition and externalisation of knowledge, skills and understanding by individuals or groups of people in ways that enhance their capacity to act and alter their contexts from the current level to the next possible level of understanding. I mainly worked with learning in relation to networked activity systems in the study.

1.7.2 Practice

“Practices are structured and relatively enduring activities which involve the imposition of particular forms of raw materials ... consist in the transformation of „determinate raw materials“ into a determinate *product*, a transformation effected by a determinate human behaviour, using determinate means („of production“)[emphasis in original]” (Dean, 2009, p. 138). Green (2009) noted that the field of practice is characterised by phenomena such as agency, knowledge, language, ethics, power and science. Practice is in itself a form of action knowledge, also called practical sense, practical logic or practical knowledge. Green (2009) drawing on a number of scholars, but especially from Schatzki, Reckwitz, Heidegger and Wittgenstein, Bourdieu, Dreyfus and Hall, noted that practice is more than merely an epistemological question because it is not only about what goes on in the head of a person but also in the body; and is therefore closer to praxis. He further argued that practice ontology is concerned with “what people do, not what people say they do”, their everyday practices rather than their conceptualisations or their thinking (Green, 2009, p. 41). Practice is concerned with the vernacular, the everyday; the life-world and (practices) are the source of intelligibility. Practice is made up of three dimensions according to Schatzki (1996, in Green, 2009):

- Learning how to do something or improving one’s ability to do something by repeatedly working on something and carrying it out (practice makes perfect dimension);
- Temporally unfolding and spatially dispersed nexus of doings and sayings; and
- Performing an action. He also talked of practices as “spatio-temporally extended manifolds of action and the carrying out of actions” (pp. 42-43).

Practice brings together body and mind, is an „orchestrated interplay“ between voices and bodies, and is „essentially dialogical“ and „always-already social“. It is about „doings“ and

„sayings“ as activities (Green, 2009). Green (2009) drew on Schatzki (1996) to argue that practice is a nexus of three phenomena:

- Understandings of what to do, which underscores the significance of particular knowledges such as tacit/explicit, procedural/propositional;
- Having explicit rules which may come in the form of principles, precepts or instructions and he concludes that practice is rule-referenced; and
- Being tele-affective because practice has directionality and intentionality informed by certain values and interests. The last dimension makes practice purposive, and has also been called motivational knowledge. (p. 43)

Hodkinson, Hodkinson, Ford & Hawthorn (2007) described habitus in the following way:

The habitus is made up of a battery of dispositions which orientate a person towards all aspects of life. They are embodied, incorporating the emotional, the physical and practical as well as the cognitive. Dispositions are thus at least partly tacit, and enduring, but can and do change. They are developed (learned) throughout life, but can be seen as social structures operating through the person. (p.403)

Bourdieu (1990) described *habitus* as an underlying social structure shaping the way things are done. The *habitus* can be interrupted, but this is not an easy thing to do. According to Bourdieu (ibid.), practice is a complex social activity involving habitus, field and capital. It occurs in space and time; is guided by tacit knowledge which is not fully unconscious or fully conscious; and is purposeful and strategic. Practice involves improvising as people (agents) invent in the interplay between freedom and constraints (Green, 2009). In his discussion in *Logic of Practice*, Bourdieu (1990) proposed that practices are:

- Characterised by an improvisory and strategic logic;
- Time and space bound, meaning that they have spatio-temporal dimensions;
- „Experience laden“, suggesting that they also embody tacit knowledge which is difficult to put in words; and
- Not easily interpreted from descriptions of them.

Bourdieu (1990) used the theory of habitus to explain dispositions that shape people's tendencies to act in ways that may not be fully conscious. Dean (2006) made a similar observation:

All cultures necessarily „teach“ in a way which does not require the conscious cooperation of its members. Much, most, or sometimes all of the learning of speech, for example, goes on „behind the back“ of the learner. This unselfconscious learning is a necessity which lays down individual dispositions and capabilities (or debilities and capacities) long before the individual is capable of reflexivity... It is an imitative non-reflexive form of learning... Human capacities are nurtured through the nurturing of bodies whose nature is such as to require culture. Culture is as much part of humanity as is our biology. (p. 133)

In this study, the notion of practice is used to refer to a collection of related activities that serve a particular purpose, and includes doings, sayings, training and habituations, and is both bodily and mental. In short I use practice to refer to a way of doing things which is informed by place, thoughts, values, interests and habitus. For example, sustainability practices are those actions and activities that are mindful of social, economic and ecological needs of current and future generations.

1.7.3 The Workplace

At the workplace, engagement in goal-oriented activities helps to “reinforce, refine and extend individuals’ knowledge” (Billet, 2001, p. 4). In discussing workplace learning it is important to acknowledge that those who occupy workplaces and therefore learn in them, are adults. Knowles, discussed in Sawchuk (2003), proposed the notion of „andragogy“ to refer to, “the science and art of helping adults to learn”. One of the key values of Knowles’ work is that adults are more or less autonomous and their learning takes places in a developmental and social context fundamentally different from that of children. This is what led to the popularization of the concept of facilitation, instead of teaching (Sawchuk, 2003). The main criticism of his approach is the retention of the expert-novice relationship and the neglect of horizontal learning. The workplace can be seen as that place where people produce goods and services and where their primary concern is earning a livelihood, not learning. Workplace learning is shaped by historical, cultural and situational factors (Billet, 2001). Workplace learning can also be seen as intentional because it is often central to continuity of a community. Studies by Lave (1990) showed that workplace learning is structured so that the participant starts with tasks of low accountability before moving to those of high accountability, where mistakes would be more costly. Work can be seen as an active and intentional effort where the worker transforms an object and the activity takes place somewhere, rooted in history and culture. The workplace might be a national park, a farmer’s field or a factory that produces clothing. The practices in the workplace tend to shape the kind of learning that takes place.

Workplaces are often associated with competences and they provide an interesting perspective on learning that takes place there. Their main limitation though is that they tend to privilege learning that allows state and corporate bodies to impose power and control over individuals by marginalizing knowledge and understanding that is unrelated to workplace performance (Edwards & Usher, 1994 in Lotz-Sisitka & Raven, 2009, p. 311). Similarly Bauman (1998) explained that modern work practices developed in the context of capitalism, industrialisation and colonialism were constituted through a battle for control and subordination and detached the work itself from the purpose that it might serve. It resulted in the separation of workers from their wider contexts, including relations with nature.

However, new workplace practices are addressing some of the problems associated with modernist practices. These include practices such as environmental impact assessment, sustainable agriculture, energy conservation; water resource management, environmental education and biodiversity conservation (Lotz-Sisitka, Motsa, Mukute & Olvitt, 2008). Every workplace has an environment which affects how learning happens and one of the key questions is how we can make learning more desirable in the workplace (Billet, 2001). Billet (2001) observed that workplace values and norms shape and distribute opportunities for participation and therefore, for learning. Workplaces afford individuals different opportunities to learn. This is what Gibson (1969, in Billet 2001) referred to as „affordances“.

I use workplace in this study to refer to places where farmers grow and produce food, where they learn about farming and where they market their produce. I also use it to refer to places where sustainable agriculture facilitators and conventional agricultural extension workers do their work, which covers their offices and the fields of the farmers they work with, and the area in between. The workplace also covers that of organic entrepreneurs, which may range from vegetable beds in the garden to stalls in the market, or to upmarket restaurants. But more importantly, the workplace is not treated as merely a physical space. It also encompasses the learning and producing that takes place which then constitutes a local activity.

1.7.4 Sustainability

Sustainability itself is a complex and contested concept. To some it implies persistence and the capacity of something to continue for a long time. To others, it implies resilience and the capacity to bounce back after unexpected difficulties. With regard to the environment, it involves not damaging or degrading natural resources. Others see it as a concept that means developmental activities simply take account of the environment. (Pretty, 1995, p. 11)

Sustainability as a concept arose in response to the challenges associated with industrialization and its exploitation of natural resources at a pace that could not be sustained and the relatively high population growth during the same period. Sustainability is one form of response to industrialism (Martinez-Alier, 2002; Dryzek, 2005). One form of sustainability, which has gained central importance today is sustainable development which Lotz-Sisitka (2008a, p. 1) defined as “practices that take full account of the economy-environment-society nexus in development interventions and initiatives (e.g. production processes), and that are oriented towards ecological sustainability, social justice, and a more benign economic system”. She proposed the deployment of the notion of sustainability practices in the Rhodes University SAQA research programme “for reflexive and critical engagement in workplace learning contexts where emergence of new practice and social change is both possible and necessary”.

Issues and discourses of sustainability took centre stage from the 1960s but the term sustainability gained currency in the 1980s (Dryzek, 2005). Sustainability is one form of environmentalism in response to growing population and industrialism and finds expression in sustainable development. The most widely used definition of sustainable development comes from the World Commission on Environment and Development (WCED) (1987), which sees the aim of sustainable development as seeking to ensure that needs of the present generation are met without compromising those of future generations, thus ensuring inter-generational and intra-generational equity. WCED further explained sustainable development as “a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development, and the institutional change are all in harmony and enhance both current and future potential to meet human needs and aspirations” (WCED, 1987, p. 46). Below I discuss two ways of looking at the notion of sustainability: one is concerned with the grouping of environmentalisms into three major types and the other is concerned with the discourses, the main stories being told about environmentalism of which sustainability is one, largely based on the typologies of Martinez-Alier (2002) and Dryzek (2005) respectively. Büscher and Whande (2007, p. 24) defined discourse as “the way reality is viewed, constructed and represented”.

In this study, sustainability will include the ecological, economic and social dimensions of development.

1.7.4.1 Three kinds of environmentalisms

Martinez-Alier (2002) discussed three typologies of environmentalism: the cult of wilderness, with a strong interest in pristine areas and preservation of such areas; the eco-efficiency environmentalism which promotes efficient and responsible use of the natural resources; and environmentalism of the poor which has a strong interest in the fair and equitable distribution of benefits of resources as well as equitable sharing of costs, avoiding their externalization and displacement. Each type of environmentalism is discussed further below.

a. Cult of the Wilderness

Martinez-Alier (2002) identified the cult of the wilderness as the first stream of environmentalism which was developed in the 1950s in defence of nature from growing populations and industrialization. Some of the influential figures that promoted the cult of the wilderness are John Muir, the Sierra Club and Aldo Leopold. Its main thrust was and is to make sure that what remains of the pristine environment should be preserved outside the market. It fits in well with the idea of protected areas, national parks, world heritage sites and endangered species that are well insulated from physical exploitation by people. Some of the institutions known for promoting this stream of environmentalism are the Worldwide Fund for Nature (WWF), the Union for Nature and Natural Resources (IUCN), and the national

Departments of National Parks and Wildlife in different parts of the region and the world, which are concerned with nature preservation and conservation (Martinez-Alier, 2002).

b. Eco-efficiency

Martinez-Alier (2002) proposed ecological efficiency as another form of environmentalism that seeks to manage and reduce the negative impacts of urbanization, industrial activities and agriculture on the environment. This stream of environmentalism therefore expands the notion of environmentalism beyond the boundaries of protected and pristine areas to all other places: urban, rural, commercial, communal, industry and agriculture, the land and the atmosphere. Eco-efficiency finds expression in sustainable development and ecological modernization. It basically argues that ecological efficiency can allow more to be derived from the Earth. One of its interesting concepts is that increasing incomes will initially increase environmental impacts and subsequently reduce them (Kuznet's environmental curves). Ecological modernization has two main tools: use of eco-taxes and permits on emissions and secondly, technological development that leads to more efficiency and less energy use. The prices are set right through internalizing the externalities (Martinez-Alier, 2002).

c. Environmentalism of the poor

Martinez-Alier (2002) proposed that environmentalism of the poor is concerned with matters of social justice in the utilization of natural resources and is also known as livelihood ecology. Environmentalism of the poor argues that the poor have a stake in the environment in which they live and should benefit from it. Such environmentalism has had a racial and minority drive and character in countries such as the United States. It is also pushed for by majority groups, especially in developing countries, from where there has been a huge flow of energy and natural resources to the developed countries. Eco-feminism falls within this stream of environmentalism. The poor have co-evolved sustainably with nature and have ensured conservation of biodiversity and should benefit from it. The argument goes further to say that the cost of ecological distribution of conflicts or "bads" should be borne equitably. These "bads" are by-products of development and include toxic waste, displacement of people and forests where carbon from the atmosphere sinks (Martinez-Alier, 2002). This study is located more in the environmentalism of the poor than the other two types of environmentalism, thus adopting a social justice orientation to sustainable agriculture discourses and practices.

1.7.4.2 Discourses of Environmentalism

A second major way of looking at environmentalism and therefore at sustainability is to analyze the discourses that are taking place. Hajer (1995, p. 44) defined discourse as "a specific ensemble of ideas, concepts and categorizations that are produced, reproduced, and

transformed in a particular set of practices and through which meaning is given to physical and social realities". Dryzek (2005) identified nine environmental discourses clustered around four broad categories: Survivalism; Problem Solving; Sustainability; and Green Radicalism.

a. Discourses of survivalism

Dryzek (2005) argued that within the Survivalism theme, there are two discourses which have the following storylines: The Earth has finite resources and the human population should be reduced to appropriate levels; and the second which says, growth forever, because the human being has so much ingenuity that he/she can always overcome the challenges by using natural resources as brute matter to make the necessary resources. The latter is called Promethean based on Prometheus, a character in Greek mythology, who stole fire from the god Zeus and from then on increased human capacity to manipulate the world. This discourse rejects the limits talk arguing that people will always find ways to overcome problems. Julian Simon established himself as the leading American Promethean in the 1980s (Dryzek, 2005).

b. Discourse of problem solving

Dryzek (2005) proposed that the problem solving discourse on environmentalism recognizes that there are ecological problems and assumes that these can be addressed within the basic framework of the industrial society and seeks to address associated ecological and economic tensions. It is essentially agnostic about global limits. He suggested that one of the three discourses under the problem solving school is: leave the problem to the ingenuity of the market and environmental problems will be solved through the intelligent use of market mechanisms to achieve public ends. Environmental taxes (green taxes) are part of the game plan and are used to induce consumers to buy goods that are more environmentally friendly. Eco-labelling is another way of influencing consumer choices (of what does not harm or harms the environment less). Denmark, Finland and the Netherlands were the first countries to introduce a „carbon tax“. The other discourse in this category is called administrative rationalism and its storyline is leave it to the experts who will dissect the problem and find solutions through collaboration of government officials and experts in different fields who offer their services (Dryzek, 2005). It gives prominence to scientific expertise harnessed through science, professional administration and bureaucratic structures. It is strong in France and Germany. Administrative rationalism is hardly theorized but can be observed. It uses expert commissions and methods such as cost-benefit analyses through, for example, environmental impact assessments. The third problem-solving discourse is called democratic pragmatism and its storyline is: leave it to the people (Dryzek, 2005). It is characterized by interactive, pragmatic problem solving, flexible approach, involving many voices and cooperation across a plurality of perspectives as reflected in negotiations between opposing parties and between nations. It was a response to administrative rationalism limitations, and

seeks to respond to varieties of situations as well as to secure legitimacy from the broader public (Dryzek, 2005). Public consultation, alternative conflict resolution, policy dialogue and lay citizen participation, such as citizen jury and public enquiries are some of the methods employed to secure democratic pragmatism.

c. Discourses of sustainability

The third theme of discourses is sustainability which seeks to combine ecological protection, economic growth, social justice and inter-generational equity locally and globally in perpetuity within the current capitalist structure. The two discourses that run within the sustainability discourse are: sustainable development and ecological modernization. The storyline of sustainable development is economic development should be promoted and should be done in ways that are environmentally benign and socially just. Sustainable development is a discourse that started in earnest in the 1980s, and was particularly propelled by the publication of the Brundtland Commission report in 1987. It has its history in the concept of “maximum sustainable yield” derived from ecology and natural resources management in the 1970s. It promotes intelligent utilization of both natural resources and human systems and sees development not simply as economic but also environmental and social. It assumes that if the developing countries followed the production and consumption of the developed world, development would not be sustained by the Earth. This is where the concepts of appropriate technologies and intermediate technologies in keeping with local cultures emerged. The discourse of Sustainable Development is marked by such developments as the United Conference on Environment and Development also known as the Earth Summit (1992), which produced practical recommendations in Agenda 21, which was endorsed by 171 national government delegates. Ten years later, the World Summit on Sustainable Development (WSSD) was held in Johannesburg, South Africa where a Plan of Implementation for Agenda 21 was endorsed. The concept of sustainable agriculture, which is going to be subject of this study, is closely linked to this discourse of sustainability. This study is primarily located within this discourse but is also influenced by Martinez-Alier’s environmentalism of the poor as discussed above.

Ecological modernization discourse was developed in the 1980s and is built on the notion of partnerships between the state, the corporate sector, labour and environmentalists to develop ways of production that are environmentally good. Its storyline is capitalist political economy needs conscious reconfiguring and far-sighted actions so that economic development and environmental protection can proceed hand in hand and reinforce each other. It is guided by such principles as: pollution prevention pays and the „precautionary principle“. It is concerned with the “restructuring of the capitalist political economy along more environmentally sound lines” (Dryzek, 2005, p. 167; see also Martinez-Alier discussed above).

d. Discourses of Green Radicalism

The theme, green radicalism, has two discourses: green consciousness and green politics. The former is concerned with building sustainability through influencing people's consciousness to be green, wherever they may be and this should then lead to green societies, including structures. Its proponents are the green movement, deep ecologists, eco-sociologists, bio-regionalists and eco-theologists. Green politics is concerned with penetrating and becoming part of the decision making structures so that policies and practices are made green through the institutions as well as through building people's consciousness. It targets institutions, structures and practices more directly and this includes green parties and social ecologists. The Green Party of Germany serves as a good example (Dryzek, 2005).

In this study, the approach to learning in the context of sustainability was "relatively open-ended and transformative ... rooted in the life-worlds of people and the encounters they have with each other" (Wals & van der Leij, 2007, p. 19). Dryzek (2005) argued that learning should not be situated in any one of his discourses but should engage critically and dialogically across them.

1.7.5 Agriculture

1.7.5.1 The concepts of agriculture

Basically, agriculture is concerned with the production of crops and rearing of animals for food, fibre and other uses (Yunlong & Smit, 1994). However, the broader concept of agriculture encompasses the financing, processing, marketing, distribution of products, farm production supply and service industries, health, nutrition, and food consumption; the use and conservation of land and water resources; and related economic, sociological, political, environmental and cultural characteristics of the food and fibre system. A three-fold environmental framework of agriculture is shown below (Figure 1.2), and is useful to contextualize agriculture.

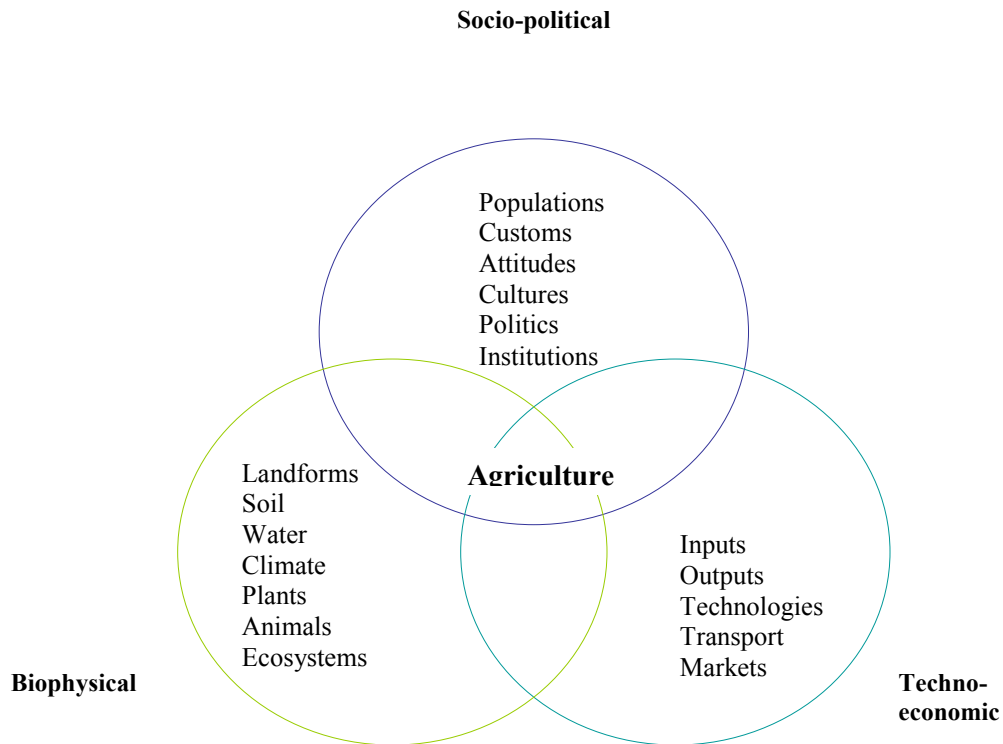


Figure 1.2: Agricultural framework *Source: Yunlong & Smit, 1994*

The above diagram (Figure 1.2) depicts the context in which agriculture takes place. The biophysical component provides the natural resources that are used in agriculture: some of these are renewable (plants and animals, for example), while others such as mineral fuels are not. Others such as rain, water and wind are variable and unpredictable. The key concern is to keep and possibly enhance the productive potential of the biophysical environment. This context of agriculture is important for understanding sustainability from an ecological perspective. The socio-political environment influences agriculture because it is the needs of the human populations, their policies, cultures, beliefs and traditions that shape the manner in which agriculture is pursued (Yunlong & Smit, 1994). The techno-economic environment is concerned about and affects the feasibility and viability of agricultural activities: costs of inputs, labour, transport and technology, prices of agricultural commodities: “The techno-economic environment combines with the socio-political environment to influence the distribution of benefits and incomes among farmer operators and others in society” (Yunlong & Smit, 1994, p. 302).

1.7.5.2 History of agriculture in brief

a. Traditional agriculture

As a practice, agriculture has evolved over thousands of years, beginning with the domestication of plants and animals. Traditional agriculture, which is still being practised in most parts of Africa uses low external inputs, for example, seed is saved, shared or traded and multiplied locally; animals graze pastures, following natural rhythms of abundance of grass; and soil is fertilized by local organic matter. Traditional shifting cultivation, with long fallow periods, could sustain up to eight people per square kilometre and this density was reached in Zimbabwe, Malawi and Swaziland in the 1930s (Whiteside, 1998, p. 12). In southern Africa, traditional farming was characterized by shifting cultivation and livestock keeping (Harry, 1938; Brundy, 1988; Isichei, 1997). Traditional agriculture satisfied subsistence needs and helped communities to obtain ecological services. Its main advantage is that it uses local resources and therefore tends to protect farmer independence and interdependence rather than encourage dependence on outsiders. There is evidence to suggest that traditional agriculture in southern Africa used to meet and exceed the needs of the populations (Mudenge, 1988 in Chenje & Johnson, 1994). One of its strategies is to minimize risk by planting several species and varieties of crops, which stabilize yields over the long term, promote diet diversity and maximize returns with low levels of technology and limited resources (Hardwood, 1979). In one survey of Northern Rhodesia (now Zambia), as many as 100 varieties of subsidiary crops were identified in an agro-ecosystem (Harry, 1938).

Traditional multiple cropping systems provide between 15 and 20 % of the world food supply (Francis, 1985). Traditional agricultural knowledge was based on acute observation as well as trial and error experimentation. This is evident in the selection of seed varieties suited to specific environments, and implicit in the testing of new cultivation methods to overcome specific biological or socio economic limitations. Chambers (1983) in Altieri (undated) notes that farmers often achieve a richness of observation and a fineness of discrimination that would be accessible to western scientists only through long and detailed measurement and computation. He further asserts that the finest discrimination tends to come from communities where the environments have broad/wide physical and/or biological diversity and those with low biodiversity. Some of the challenges of traditional agriculture are that it cannot meet the demands of growing populations and of raw materials for industry. Traditional agriculture was regarded as backward by colonial settlers in the region who undermined it using various means. It generally produces less food per unit area than modern agriculture. However, it is still being practised by some farming communities in the region. In spite of its limitations, there are some aspects of traditional agriculture that merit consideration for building sustainability into agricultural learning and practices.

b. Modern agriculture

The introduction of commercial export crops among the indigenous people, in the early part of the 19th century through colonisation and industrialisation (Harry, 1938) led to intensive crop production. It curtailed shifting cultivation and promoted cash crops. Modern agriculture was developed in order to address increased food needs of growing populations and land degradation (Pretty, 1995). It encourages the adoption of modern varieties of crops and animal hybrids together with associated packages of external inputs such as fertilizers, pesticides, antibiotics, machinery and credit facilities. Modern agriculture promotes monocropping and mono-animal enterprises geared for sale (Pretty, 1995). Wilson (1999, p. 11) argued that modern agriculture is pursued primarily for economic goals and largely ignores the social and ecological dimensions of life, which is fostered by the belief in a mechanistic/reductionist approach where planning and management deal with things in isolation (Whiteside, 1998). Modern agriculture, which gave rise to the Green Revolution of the 1960s and 1970s thrives where there are rich soils, good water supply as well as access to petroleum based products and modern crop varieties. It has also produced technologies such as irrigation techniques and equipment, improved seed varieties and greenhouse technologies that have boosted production and productivity. Specialisation in such areas as agronomy, animal breeding, seed breeding, climate, entomology and related agricultural subjects helped to provide concentrated but compartmentalised intellectual capital for modern agriculture, which propelled it forward on one hand and created problems of a mechanistic approach to living systems on the other. In much of southern Africa, modern agriculture has been unsuccessful since about 70% of the people in the region are small scale farmers who cannot afford the agricultural inputs (Booth, 1994, p. 107), and live in low and unreliable areas where the soils are generally poor. One of the „bads“ of modern agriculture is that use of chemical fertilizers has led to eutrophication of water bodies, negatively affecting aquatic ecosystems and causing proliferation of aquatic weeds such as the water hyacinth and affecting the availability of clean water downstream. The use of pesticides also pollutes water resources. The International Trade Centre and Research Institute of Organic Agriculture (FiBL) (2007, p. 9) argued that “global warming potential of conventional agriculture is strongly affected by the use of synthetic fertilizers and by high nitrogen concentrations in the soils”. Related to equity, Kiers et al. (2008) further noted “production increases have not consistently improved food access to the world’s poor. Where production has been intensified, it has been generally accompanied by costs such as extensive eutrophication from fertilizer runoff, pesticide contamination and loss of local landraces”. Modern agriculture is highly dependent on fossil fuels, a resource which is both finite and set to decline. It is this external dependence of modern agriculture on external input on the farm that makes it difficult to sustain.

The other concern about modern agriculture is that it takes away the farmers' power to experiment in activities such as animal and crop breeding and undermines the use of local resources. Scientists are the producers of knowledge, extension workers the bearers, and farmers the consumers. More recently concerns have been raised about the dispossessions caused by privatisation of land and water resources. This undermines the self-reliance of the farmer and the farming community. When natural disasters such as droughts and floods occur, farmers are left less able to adapt since their resilience is undermined. Modern agriculture has brought more food onto the table and fed the agro-based industry, addressing some of the shortcomings of traditional agriculture. However, it has created new problems especially in the social and ecological spheres, which need to be addressed. It was with the intention of addressing these gaps that the different forms of sustainable agriculture have been developed, mainly over the last 20-30 years.

c. Sustainable agriculture practices

“Economic practices are concerned with transformation of natural raw materials into things which humans find useful, or, in the capitalist case, exchangeable/usable. Political practices are concerned with the reproduction/transformation of social relations”, according to Dean (2006, p. 139). This study is concerned with sustainability practices in agriculture which are discussed below. Sustainable agriculture arose in response to the shortcomings of modern agriculture. It draws on the strengths of both traditional agriculture and modern/conventional agriculture as Pretty (1995) noted:

Sustainable agriculture does not imply a rejection of conventional practices, but an incorporation of the recent innovations that may originate with scientists, farmers or both. It is common for sustainable agriculture farmers to use recently developed equipment and technology; complex rotation patterns; the latest innovations in reduced input strategies; new technologies for animal feeding and housing; and detailed ecological knowledge for pest and predator management. (p. 13)

Sustainable agriculture is internal input ecological agriculture relying on resources available on the farm: energy labour, seed, fertilizer and knowledge (Shiva & Pandey, 2006). Pretty (1999) defined sustainable agriculture as farming that makes the best use of nature's goods and services whilst not damaging the environment by integrating natural processes such as nutrient cycling, nitrogen fixation, soil regeneration and natural enemies of pests, into food production processes, minimizing the use of non-renewable inputs and chemicals that damage the environment or harm the health of farmers and consumers (pp. 259-261). Sustainable agriculture taps into the knowledge and skills of farmers, thus improving their self-reliance and capacities (Pretty, 1999). It is multi-functional, producing non-food functions such as on-farm biodiversity; urban to rural migration; and social cohesion, thus contributing to ecological and social sustainability (Yunlong & Smit, 1994). Yunlong and Smit (1994)

outlined three categories of sustainability in agriculture based on Brown's work: ecological, social and economic sustainability. The ecological dimension involves maintaining the productive potential of the resource base; sustained crop yields; preservation of the hydrology of surface and ground water; and the protection of genetic resources and biological diversity. Social sustainability is the continued satisfaction of basic human needs such as food, shelter and higher level social and cultural necessities. Food self-sufficiency is an important part of social sustainability so that concerned societies are not vulnerable to uncertain food supply and price movements. Economic sustainability is concerned with the long-term benefits that accrue to agricultural producers, for example, sustaining certain yield levels, productivity and viability of farming. Sustainable agriculture practices in southern Africa include Permaculture; Organic Farming; the Machobane Farming System; Agro-forestry and Conservation Farming (Wilson, 1999; Mukute, 2001). As mentioned in Section 1.3, I am particularly interested in the first three because of their relative prevalence in Zimbabwe, South Africa and Lesotho respectively.

The fact that sustainable agriculture seeks to build on modern and traditional agriculture and to address the competing interests of economy, equity and ecology requires a dialectical approach to manage the contradictions and construct new solutions. Farmer participation in knowledge sharing and creation alongside other actors in development calls for learning through work (praxis) which should be accompanied by the continuous development of new ways of knowing, that is, reflexivity.

Sustainable agriculture is multi-functional within the landscapes and economies – it produces food and other goods for farm families and markets, but it also contributes to a range of public goods, such as clean water, wildlife, carbon sequestration¹ in soils, flood protection, landscape quality. It delivers many non-food functions that cannot be produced by other sectors (e.g. on-farm biodiversity, urban to rural migration, social cohesion). Douglas (1984) developed a three-fold definition of sustainable agriculture which includes stewardship, food security, and community, and which resonates well with Brown, Hanson and Meredith's (1987) three categories of ecological, economic and social sustainability respectively, and with the definition of Pretty above.

1.8 METHODOLOGY

In working with suitable theoretical framings in relation to research questions, I had several challenges given the complexity of the focus and context of the research. I needed to draw on theories that could help to explain how farmers learn and why they were facing challenges in

¹ Carbon sequestration involves the absorption of carbon by plants so that there is less available in the atmosphere to cause global warming.

their practices (Pyburn, 2007; Hill, Capper, Wilson, Whatman & Wong, 2007). Pyburn, for example, underscored the value of collaborative learning and collective wisdom and distributed cognition that can happen in social learning. Hill et al. (2007) underlined the value of expansive learning. I also needed theories that would provide me with a perspective on dialectical issues inherent in the contested nature of sustainable agriculture and between it and conventional agriculture (Engeström, 1987, 1999a, 2008; Edwards, 2005b; Daniels, 2008). I also needed to draw on theories that would support farmers and their development facilitators, the main research participants, in empowering and non-extractive ways. This was an important methodological issue since I was interested in their agency as informed by what Dean (2006) called an „ontology of potential“ and as argued by Engeström (2008) when he discussed the role of the interventionist researcher. Focussing on change oriented learning in sustainability practices in agriculture, I found Cultural Historical Activity Theory (CHAT) to be a useful theoretical tool, supported by the theories of structure and agency and underpinned by critical realism.

CHAT is built on and addresses matters of praxis, reflexivity and contradictions (see Section 3.6.4). I was interested in how people learn through work and make work the object of critical reflection, which is praxis (Freire, 1972). This resonates with Macey’s (2000) explanation that praxis is “purposeful human action” (p. 311). Similarly, Gramsci in (Vare, 2008) defines praxis as “the interaction between theory and practical action, the process through which common sense changes and a more critical common sense can develop” (p.141). I was also interested in working with research participants to deliberately and continuously build their understanding of their practice and the context in which they were conducting their activities, which is reflexivity. This was because the research was focussed on change oriented learning.

Recent work in CHAT is evolving a methodology called Developmental Work Research (Engeström, 1987; Engeström, 1999a, 1999b; Warmington et al., 2005; Edwards, 2005a, 2005b; Roth & Lee, 2007; see also Section 4.2.1) which has potential to:

- a. Illuminate and expand the learning taking place in communities that are promoting and practising Permaculture, Organic Farming and the Machobane Farming System (MFS);
- b. Historicize each of the three selected sustainable agriculture practices with a view to understanding the learning and practice processes in each case study;
- c. Identify and analyze current limitations occurring within each case study or activity system and use the contradictions as potential basis for expansive learning; and
- d. Produce future tools to deal with new and emerging challenges and set the stage for continued improvement of practice using the expansive learning process.

As discussed above in Section 1.6.3, the study had an explicit intention to increase the agency of the farmers – their ability to achieve what they want. While some of the agency can be increased through improving knowledge and practice, the other forms of agency may be of a structural nature. To address this relationship in depth, I drew on theories of structure and agency. Archer’s theory of structure and agency and her notion of analytical dualism were useful for establishing the contradictory nature of structure and agency and revealing the interplay between farmers and the structures that affect them leading to morphostasis or morphogenesis (Archer, 1996; 1998). Bourdieu’s theory of habitus provided a perspective on how the sub-conscious can influence the farmers’ practices and affect the choices they make. The potential value of critical realism resided in its ability to provide an explanatory critique, with ontological depth, that goes beyond the actual and the observed to the causal mechanisms that are invisible, thus avoiding the fallacy of actualism (Bhaskar, 1998; Lotz-Sisitka et al., 2008; see Section 3.2). More specifically, critical realism in a change oriented learning study of sustainable agricultural practices was useful because it:

- Is committed to changing unsatisfactory and oppressive realities;
- Recognises the independent existence of objects of scientific enquiry;
- Is based on reflexivity about possibility of thought, or language to represent something outside itself;
- Assumes that surface appearances (empirical) are potentially misleading and insists on getting beyond or behind surface appearances; and
- Admits that our knowledge of the natural and social world is both fallible and provisional because our experience of the world is always theory laden and always open to correction in the light of further work such as dialogue, experiments, interpretations and observation (Benton & Craib, 2001, pp.120-121; Sayer, 2000).

The study also drew on *relationalism* and not substantialism because my basic assumption is that reality is based on relationships between many different parts that are connected and related to each other and are also capable of influencing each other (Emirbayer, 1997) as reflected in the analysis of activity systems in this study (see Sections 3.4.2.3 and 6.1).

1.9 OUTLINE OF THESIS

Chapter 1 outlines the focus and goals of the study and introduces the theoretical framework. It also discusses the context within which the research emerged, and the conceptual framework. It therefore provides the necessary background to the study. It concludes by summarising what each chapter of the thesis contributes to the whole.

Chapter 2 discusses agriculture: its history, the issues that are being encountered, and the progress made with sustainable agriculture. The context discussion begins at a global level,

and moves to a continental level before focusing on southern Africa and the specific countries in which the case studies are located, that is Lesotho, South Africa and Zimbabwe. Trends, patterns and connections are revealed. The chapter traces the global history of agriculture before focusing on southern Africa. This sets the stage for the discussion of the three sustainable agriculture practices under scrutiny in the study, namely: Permaculture; Machobane Farming System; and Organic Farming. The chapter also explores the approaches to learning in both conventional and sustainable agriculture practices and the assumptions behind the approaches. The shifts in approaches are also examined in relation to conventional and sustainable agriculture.

Chapter 3 discusses the main theories that underpin the study as well as the methodology employed. It also gives reasons for the selection of the different theories employed. The theories as introduced in this chapter are Cultural Historical Activity Theory as propounded by Vygotsky and Engeström; theories of Structure and Agency based on Bourdieu and Archer and Critical Realism based on Bhaskar's work.

Chapter 4 explains the processes by which data was generated, analysed and managed. It discusses the methodology of Developmental Work Research developed by Engeström and others; multiple embedded case studies; semi-structured interviews; change laboratory workshops and document analysis. It also discusses sources of data and how I, as researcher, related with participants in relation to ethics, validity of data. The chapter further discusses how data was analysed and concludes with reflections on methodology.

Chapter 5 discusses findings in relation to how farmers are and have been learning sustainable agriculture practices and the factors that are shaping the learning and learning processes. It also discusses the history and evolution of the practices as well as the history of each case study. This constitutes what Engeström calls the interpretive layer of causality and the first layer of double hermeneutics.

Chapter 6 surfaces the main contradictions in each case study primarily focusing on the sustainable farmer and facilitator activity systems in each case study. Some of the contradictions are later used as potentially fruitful places of learning and development. This chapter covers the contradictory causality layer in Engeström's terminology.

Chapter 7 shows how I, as the intervention researcher, and research participants worked on some of the contradictions the participants were facing in their sustainable agriculture practices and how they were addressed through and between Change Laboratory (CL) workshops. In each case, some tools were developed.

Chapter 8 draws on transcripts from CL workshops held during the study to conduct a micro-level analysis of agentive talk, reflective talk and learning trajectories to provide insight into learning-agency relationship to address the change oriented learning interest of the study. In this chapter, I also examine my role as a researcher in the expansive learning process.

Chapter 9 identifies and discusses the major theoretical issues and contributions in the study. These include: spatial and temporal considerations in agricultural practice; agricultural cognition; agency and agentive talk; learning trajectories and zone of proximal development. It also discusses methodological reflections and contributions, including possible tools for use in the field.

In Chapter 10, the main conclusions and recommendations are made. Recommendations are proposed for each case study as well as across case studies. The chapter concludes with a discussion on my view of the history of the future of sustainable agriculture based on what has been and is going on in the world and the case studies examined in this thesis.

1.10 CONCLUSION

In this chapter I discussed how the study emerged: the background to the research; the research questions; the sensitising concepts and key terms; and the theoretical framework underpinning the research. The chapter also provided a brief account of what each of the remaining chapters discuss. In the next chapter (Chapter 2), the focus is on illuminating sustainable development and agricultural issues as well as the learning and educational matters to which this research on sustainability practices and change oriented learning sought to respond. Essentially, therefore, the next chapter provides context and justification for the study.

CHAPTER 2: Review of environment and development, agriculture and extension in southern Africa

I am often asked whether a trade-off is required between the environment and development. I always say no. We need and must have both; what is important is a good balance between the two. (Maathai, 2009, p. 250)

2.1 INTRODUCTION

Food and agricultural sustainability are key aspects of sustainable development, but economic, environmental and social sustainability is now challenged by energy crises, conflicts over resources, inequitable distribution, pandemics, ecosystem degradation and the impacts of climate change. (FAO, 2009a, p. 4)

This chapter provides the context within which the study was conceptualised. Its main thesis is that we are living in a risk society globally, regionally and locally and this requires ways of knowing and doing development that are underpinned by a risk epistemology. The chapter also provides evidence of kinds of risks and in some cases, the extent of risk in the agriculture sector of southern Africa and discusses how research, education and extension have been and are responding to risk and uncertainties that come with it. The chapter also discusses how agricultural ways of knowing and practice have evolved both globally and regionally. It briefly examines the status of agricultural training and research in the three counties under review: Lesotho, South Africa and Zimbabwe, identifying current priorities. Some of the agricultural learning issues are highlighted. Finally, the chapter discusses the implications of risk and current and emerging agricultural educational responses on this study and how it was conducted. In short, this chapter points to the need for research on change oriented learning in sustainable agriculture practices so as to generate an in-depth understanding of farmer learning in social learning contexts.

2.2 RISK SOCIETY

2.2.1 Conceptualisations of risk

Risks can be seen as hazards or dangers associated with future outcomes, which are probable and uncertain (Mythen, 2004). There are pillars of risk which according to Beck (in Mythen, 2004) environmental risks of nowadays cannot be geographically or temporally contained, while social risks cannot be attributed to solitary sources (Mythen, 2004, p. 19-21). A second pillar is the potentially high catastrophic effect of manufactured risks such as nuclear risks, compared to natural risks such as volcanoes. Human beings are capable of destroying all they have created with what they have created. The third pillar is that institutions responsible for providing safety and security against risks are increasingly finding it difficult to do so. Wells

(2007) identified a number of crises that reflect Beck's description of „manufactured risks“ which include global warming; habitat diversity and species loss; energy supplies; food supplies; skewed distribution of wealth, ownership and power; and uneven power relations exerted by agro-business (pp. 211-212). Although risks are generally perceived to be bad, they seem to have galvanised the world to work collaboratively on some issues, notably climate change and food security. The idea of a single world, “Our Common Future” (developed against the backdrop of the Cold War) helped to propel the environment agenda onto the centre stage in international affairs (and this can be seen as the germ cell of sustainable development, a kind of springboard):

The global conception of the environment fitted the geo-political need, creating a momentum that famously culminated in the Rio Summit in 1992, the site at which working definitions of sustainability became endorsed by governments, non-governmental organisations (NGOs) and business. Of course, the discourse of sustainability is riddled with ambiguity and conflict: between the twin goals of environment and development, between the often opposing demands of the South and those of the North, and between the technocratic approach of managers to treat environmental issues as essentially engineering and administrative problems and those who argue for more profound shifts in human-environment relations. (Macnaghten, 2006, p. 134)

2.2.3 Some of the global risks that impact on agriculture

One of the critical risks at global level that has been partly attributed to industrialisation is climate change (UNEP/GRID-Arendal, 2006). A number of solutions, with a bearing on agriculture have been advanced, one of which is bio-fuel. But the proposed solutions appear to be undermining the livelihoods of farmers, especially the small scale subsistence farmers in developing countries. Commenting on the issue of biofuel, Markwei, Ndlovu, Robinson and Shah (2008) noted that Agricultural Knowledge, Science and Technology have a big role to play “concerning the careful analysis of biofuel technology appropriate for Sub-Saharan Africa, in parallel with the development of policies and capacity building to reduce negative effects of growing biofuels and determine the health, environmental, energy and food security tradeoffs” (p. 13).

The Action Group of Erosion, Technology and Concentration (ETC) (2008) pointed out that there are conflicting interests between transnational agro-companies of the world who seek profit and corporate control of the agricultural production chain on the one hand, and farmers who are concerned with food and health systems built on resilience, sustainability and sovereignty, on the other hand. The group also attributed the current food deficit in developing countries to the “tragedy which stems from decades of depressed commodity prices, trade liberalisation, withering investments in national agricultural programmes, and the ever-increasing dominance of the corporate agro-industrial food system” (ETC, 2008, p. 6). According to an FAO report in ETC (2008) in the early 1960s, developing countries

had an overall trade surplus in agriculture worth US\$7 billion per year. Policy makers seem to favour continued corporate growth and dominance over social development. ETC (2008) found it revealing that the response to the global financial crisis was to inject capital and call for some regulation while the response to food crises was to press for further de-regulation:

When the food crisis is defined as food scarcity and hungry people, the market based prescription is to further liberalise the markets and boost agricultural production with heavy doses of technology ... The system has entrenched corporate power while undermining the ability of small scale producers to produce food for their own communities. (ETC, 2008, p. 6)

ETC further argued that corporate solutions to climate change are not made in the interests of social and ecological sustainability but are intended to make profits at the expense of people such as small scale farmers. One of the recent examples they cite to support their conclusion is the corporate response to climate change and peak oil:

Recent experience with industrial agro-fuels offers a modern day parable about the dangers of techno-fixes that are promoted as green and sustainable solutions to peak oil and climate change. By mid-2008, even some OECD countries were admitting that industrial agro-fuels have been a tragic boondoggle that can't be remotely described as a socially or ecologically sustainable response to climate change. Not only are industrial agro-fuels driving the world's poorest farmers off their land and into deeper poverty, they are the single greatest factor contributing to soaring food prices and have pushed 30 million additional farmers (so far) from subsistence to hunger. (ETC, 2008, p. 37)

Similarly Pimbert (2009) in discussing the politics of knowledge argued that reductionist knowledge selectively favoured corporate profits as well as control over labour and nature. He pointed out that the use of Genetic Use Restriction Technologies, also called terminator technology because it causes second generation seed to be sterile, and the recent convergence of information technology, nanotechnology (based on atoms), neurosciences and biotechnology, has allowed the corporate sector to enclose people and commodify nature's autonomy (Pimbert, 2009, p. 9). Multinational agro-based industries have been recently accused of attempting to control the agricultural production chain by patenting seed and related knowledge (Shiva, 2006). Apart from undermining local knowledge systems and agricultural practices, the enclosures have resulted in biopiracy, „stealing“ local knowledge and plants and protecting them from use by the very people whose knowledge has been „stolen“ (Mushita & Thompson, 2006). The development of Genetically Modified Organisms (GMOs) has also caused concern among farmers who are afraid that their landraces will be permanently contaminated and consumers who are unsure about the consequences of consuming such foods. This is why the government of Zambia refused GMO maize donated from the US in 2004, even though its people were hungry. This event happened after Southern African Development Community (SADC) member states had agreed on “common guidelines to safeguard member states against potential risks in the areas of food safety,

contamination of genetic resources, ethics, trade and consumer concerns” in 2003 (Mzinga, 2005, p. 31). Also commenting on GMOs, Markwei et al. (2008) argued:

Genetic engineering is considered by some to have important ramifications for productivity but some of its uses and impacts are hotly *contested*. Contamination of farmer-saved seed and threats to biodiversity in the centres of origin are key concerns with respect to biotechnology and genetic engineering in particular. The environmental risks and evidence of negative health impacts means that SSA’s ability *to make informed decisions* regarding biotechnology research, development, delivery and application is critical [my emphasis]. (p. 12)

At the same time:

The politics of the critique of science become more complex and *ambivalent* in the face of the new ecological issues. While the Greens see the interests associated with techno-science as largely to blame for many ecological hazards, they also rely on scientific detection, measurement and theoretical explanations in making out the Green cases [my emphasis]. (Benton, 2001, p. 137)

This subsection (2.2.3) highlights again the need for dialectics in dealing with sustainability matters in agriculture as well as in other fields of practice.

2.2.4 Responses to risk

Bauman (2002) pointed out that there is daily evidence that shows how people across the globe have become interdependent: “In view of our interdependence, „*solidarity of fate*” is not a matter of choice. What does depend on our choice is whether that shared fate will end up in mutual destruction, or generate solidarity of feelings, purposes and actions” [emphasis in original] (p. 16). Beck (2000) has argued that there is evidence of growing solidarity. He posited that the risk society in which we live has become reflexive in three senses: global dangers result in global mutualities in which contours of a global public sphere begin to take shape; the dangers trigger an impulse towards the development of cooperative international institutions; constellations of sub-politics appear, which are at once global and direct, which may lead to a global alliance of alliances of mutually exclusive beliefs (p. 20). Sub-politics refer to globalisation from below involving the activism and participation of civil society (Bawden, Guijt & Woodhill, 2007, p. 133). In this research I consider sustainable agricultural practices in different parts of the world as holding potential to respond to present day food insecurity, land degradation and marginalisation of some forms of knowledge (Beck, 2000). Similarly, Karottki (1997) noted:

As a national civil society is involved in advocacy, innovation and organising people to *address their visions and their problems* the global civil society will take a similar role on the international scene ... the global civil society has the potential to rapidly develop into a strong third power in global governance ... community oriented environmental groups often organise specific initiatives that mobilise communities to take responsibility for their own situation and to demonstrate *alternative solutions and models in practice* [my emphasis]. (p. 114)

Mythen (2004) argued for reflexive globalisation, which is bottom up and happens when ordinary people rise to challenge institutions and agents that generate environmental risks, as well as through engaging in ecologically sound practices and local actions that create global impact (p. 37).

Funtowics and Ravetz (1994) argued that “the problems of global environmental risk, along with those of equity among peoples presents perhaps the greatest collective task now facing humanity” (p. 1181). They proposed „post-normal science“ as the solution because uncertainty now rules political and environmental affairs; normal science is ill-equipped to resolve the problems in the risk society. They discussed three problem solving strategies in three circumstances differentiated by the degree of uncertainties (systems uncertainties) and value conflict (decision stakes) (Funtowics & Ravetz, 1994, p. 1881). This thinking is condensed in the figure below (Figure 2.1).

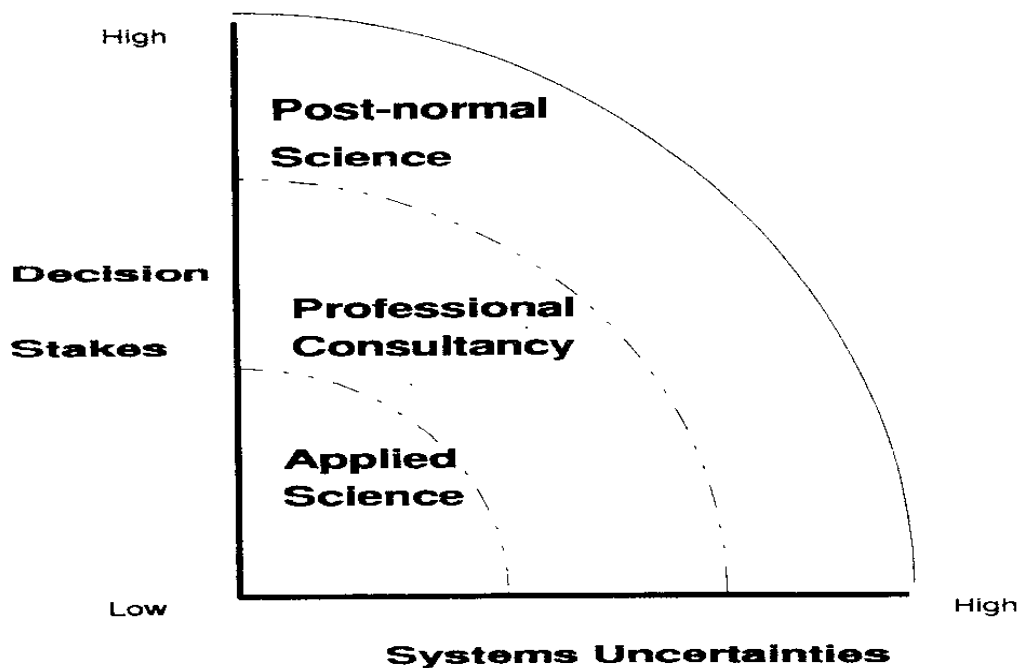


Figure 2.1: Three problem solving strategies including post-normal science

Source: Funtowics & Ravetz, 1994 (p. 1882)

Discussing the above figure (Figure 2.1) Funtowics and Ravetz (1994) noted:

The two strategies, applied science and professional consultancy, are familiar from past experience with scientific and professional practice. The third, referred to here as post-normal science, is appropriate where the systems uncertainties or decision stakes (or both) are high. It is particularly useful in the practice of the research dealing with the global environmental issues. Here the problem of quality assurance of scientific information are particularly acute and require

new conceptions of scientific methodology ... an „extended peer community“. This extension of legitimacy to new participants in policy dialogues has important implications for society and for science as well. With mutual respect among various perspectives and forms of knowing, there is a possibility for the development of a genuine and effective democratic element in the life of science. (pp. 1881-1882)

An interesting point to note here is that Funtowics and Ravetz are saying that there is a place for different approaches to science but when it comes to risk and uncertainty, the ideal way is not only to combine different ways of knowing but also perspectives, and values. Here then, people’s values matter as much as facts do. This resonates with Beck’s (1992) emphasis on the importance of inter-epistemological dialogue in the resolution and comprehension of complex environmental issues and associated change processes. Funtowics and Ravetz further argued that even when dealing with uncertainty there is a place for core science, applied science and consultancy but these should not dominate the decision-making process – because not all aspects of the problems will have high uncertainties and conflicting values. Therefore post-normal science comes in handy when dealing with uncertainties of an epistemological and ethical nature. “The traditional fact/value distinction has not merely been inverted; in post normal science, the two categories cannot be usefully separated. The uncertainties go beyond the systems, to include the ethics as well” (Funtowics & Ravetz, 1994, p. 1184). They cited loss of biodiversity and climate change as some of the issues that need a post-normal science approach. In a related discussion, based on responses to climate change risk, Lotz-Sisitka (2010) drawing on the work of Nancy Fraser proposed that:

Reflexive justice should *at the same time* entertain and strengthen urgent claims on behalf of the disadvantaged „...while also at the same time parsing the meta-disagreements that are interlaced between them. Because these two levels are inextricably entangled in abnormal times, reflexive justice can therefore not ignore either one of them“ [emphasis in original]. (p. 81)

Reflexive justice suggested above means that solutions to problems that are being experienced by farmers who are „victims“ of climate change and other challenges that emerged from industrialisation, must be addressed directly while the structural issues that are causes must also be addressed at the same time, in the full understanding that the former is urgently needed and must happen sooner, and the latter is imperative for meaningful justice but will take longer.

Climate change has a strong bearing on agriculture, which is the focus of this study and the suggestions above could have implications on how it may be learnt and practised in terms of how agricultural knowledge in conditions of risk may be generated, validated and socialised. As Pimbert (2009) noted, there is need to “re-embed citizens in the production of knowledge and fundamentally democratise social and natural sciences research organisations and universities... citizens will inevitably have to challenge the positivist and realist

epistemologies of „actually existing“ science” (p. 23). Discussing contemporary crises, which may be seen as risk, Dean (2006, p. 144) noted that their resolution happens on the basis of well planned “collective action which becomes possible only on the basis of novel kinds of education and experiences, that is, education and experiences intended to nurture theoretical and scientific intelligences and abilities. In this lies the connection between the dialectic and agency”. But what constitutes science may be understood differently in different places. Here I find Visvanathan’s (2006) conceptualisations particularly useful. In his argument for alternative sciences, he did not propose the replacement of modern science but rather its existence side by side with alternative sciences. He further proposed growing with it and allowing for a critique of modern western science and its history of hegemony in relating to other forms of knowledge.

Modernity has not only been hegemonic in the way it constructed the primitive, the peasant, the nomad, the tribal, the madman, the woman, the patient and the worker. The „primitive“ like the patient, was the object of the gaze, to be studied, objectified, measured, evaluated, mapped. The patient’s knowledge of his body or the tribal’s knowledge of his environment was read as irrational or condemned as ethno-knowledge... In relating with the other modern western science either eliminated, assimilated, ghettoized or museumised them ... the idea of an alternative science is a charter to challenge the current politics of knowledge. (Visvanathan, 2006, pp. 165-166)

Visvanathan (2006) drew on Bauman and Lévi-Strauss in relation to how modern science preyed on other knowledges and on Wallace’s work in *Wonderful Century* to argue that “the success of science made it ethically and cognitively imperative for the scientist to invent and explore alternatives” (p. 166). Perhaps Visvanathan’s most important contribution here is his proposal of cognitive justice to replace „monocultures of minds“ – “a simultaneous congregation of knowledges and knowledge-makers to debate their assumptions ... a parliament of knowledges for science, where a sense of plurality prevails” (Visvanathan, 2006, p. 167). He concluded his paper by arguing that modern science should dialogue and negotiate with other forms of knowledge “to create a pluralist world of cognitive possibilities where *emergence* rather than reduction was emphasized” [my emphasis] (Visvanathan, 2006, p. 169). His arguments are clearly connected with those of using post-normal science to address risks. So are those of Bauman (2002) who underlined the value of both diversity and solidarity to overcome problems of late modernity:

The only „settlement“ on the cards on our full planet is that of human’s reconciliation with its own *incurable diversity*. The sole feasible chance of a settlement stands and falls by our acceptance that it is precisely from such diversity that humanity’s powers to transcend present horizons and to draw new ones derive ... the road leads through a coherent effort to reforge the human diversity that is our shared fate into a vocation of human solidarity [my emphasis]. (p. 22)

Vandana Shiva who has been working in the area of biodiversity and agriculture has made similar suggestions about response to risk. She questioned the privileging of one form of knowledge over others – „monoculture of minds“ – which runs against the notion of diversity, sustainability and current ways perceived to be capable of dealing with risk.

Sustainability demands that we move out of the economic trap that is leaving no space for other species and other people. Our central challenge for the new millennium is to change the global economic system which is based on fear and scarcity, monocultures and monopolies, appropriation and dispossession, to a system based on abundance and sharing, diversity and decentralisation, and the respect and dignity for all beings. The monoculture of the mind and its blind war on diversity and the natural world must come to an end. (Shiva, 2002, p. 67)

The point in drawing on the politics of knowledge, the dominance of modern science and the domination of corporate interest is not to show how bad modern science is or corporate companies are, but to illustrate how they are inconsistent with sustainability, ethics and equity demands that are being placed on the world by current and emerging issues and understandings. They are not consistent with the thinking that underpins sustainable development, education for sustainable development or sustainable agriculture and food sovereignty². They exemplify the notion of „power over“ rather than „power with“. The latter concept of power implies democratisation of research, science and technology. The notion of „power with“ does not mean „everything goes“ as previously explained by Funtowics and Ravetz (1994) through their concept of extended peer community and as Shava (2008) suggested:

The integration of indigenous and western knowledges is a political process that provides space for different epistemologies and diverse knowledges to interact in an arena that was previously dominated by western/modernist knowledge discourses. This provides a greater scope of choices and a plural platform for positioning different knowledge discourses in formal education and development contexts. However, we should be wary and critical of the integration of indigenous knowledge if it is pursued to serve the interests of modern institutions and corporate capital, thereby perpetuating the appropriative, assimilative, and exploitative tendencies of modern institutions. (p. 269)

² Via Campesina in Mzinga (2005, p. 35) defined food security as the right of peoples, communities and countries to define their own agricultural, labour, fishing, food and land policies which are ecologically, socially, economically and culturally appropriate to their unique circumstances. IAASTD (2008) defined food sovereignty as “the rights of peoples and sovereignty states to democratically determine their own agricultural and food policies” (p.8). Delegates to a PELUM South Africa workshop in 2008 defined it as “... the right of peoples to healthy and culturally appropriate food produced through ecologically sound and sustainable methods, and their right to define their own food and agriculture systems. It puts the aspirations and needs of those who produce, distribute and consume food at the heart of food systems and policies rather than the demands of markets and corporations. It ensures that the rights to use and manage lands, territories, waters, seeds, livestock and biodiversity are in the hands of those of us who produce food” (Auerbach, 2009a, p. 2).

The Sub-Saharan Africa team that worked on the International Assessment of Agricultural Knowledge, Science and Technology for Development group concluded and recommended the following in terms of environmental risk in agriculture:

Most farmers in SSA³ operate in an environment of high risk and uncertainty. Farmers therefore tend to adopt strategies that minimize risk and vulnerability at the expense of profit-maximising strategies. When AKST⁴ builds on farmers' and pastoralists' coping strategies and innovations thereby placing local people's knowledge and actions, such as diversified production practices used by 90 % of the SSA farmers, at the centre of research efforts, the multiple functions of agriculture are better realised and the threats to climate change mitigated. Options include undertaking collaborative research with farmers. (Markwei et al., 2008, pp. 16-17)

The discussion above shows how the world itself has contradictory objects that need to be negotiated continuously so that some parts of the multiple objects do not unduly suffer at the expense of the other(s). At the same time, the example illustrates how interests are competing at global level, with implications at local levels. The challenge for farmers lies in how to engage the corporate sector constructively to work with them for the good of humanity and the environment and in a manner that recognises and rewards local knowledge and ways of knowing. Pimbert (2009) argued that "more inclusive ways of knowing are required to bring together the partial and incomplete perspectives of different actors faced with uncertainty, diversity and change" (p. 22).

2.2.5 Risk society: dialectics, reflexivity and agency

The issues arising from a risk society are diverse, complex and have the potential to affect all (Beck, 2000). They therefore seem to call for a dialectical approach to overcome „monocultures“ of the mind and bring different minds and voices to engage authentically, and utilise reflexivity by drawing on different forms of accredited expert knowledge and practical, local, experiential knowledges to the work context. But this kind of social learning, which is democratised, should not only aim to understand the world better – but also to transform it, through the exercising of agency. And such agency requires an engagement with structural issues, which cause problems that appear on the surface. This explains why the thrust of this study is to understand how some of these risks and uncertainties are being encountered in local communities and how they are working with them, dealing with the contradictions being encountered as well as how different knowledge systems and forms are being utilised. As mentioned earlier the point of understanding these processes in the study is to be able to stimulate change oriented learning through expansive learning processes (see

³ Sub-Saharan Africa

⁴ Agricultural Knowledge, Science and Technology

Section 1.5). Since the study is located within a southern African agricultural context, the next section examines associated risks and uncertainties in and around the region.

2.3 AGRICULTURAL ISSUES, RISKS AND UNCERTAINTIES IN AND AROUND SOUTHERN AFRICA

Agriculture has a footprint on all the big environmental issues, so as the world considers climate change, biodiversity, land degradation, water quality, etc. they must also consider agriculture which lies at the centre of these issues and poses some uncomfortable challenges that need to be faced... We have got to make sure that we don't degrade our soil, we don't degrade the water, and we don't have adverse effects on biodiversity. These are major challenges, but we believe that by combining local and traditional knowledge with formal knowledge these challenges can be met. (IAASTD, 2008, p 2)

The combination of traditional knowledge and formal knowledge also underlies the proposition for post-normal science and cognitive and reflexive justice discussed earlier (see Section 2.2.4). Whiteside (1998) made a similar point about risk in connection with farmers in the region when he concluded that "Farmers in Southern Africa face a wide variety of risks – weather, war, robbery, pests and diseases, price changes. Drought has been a recurrent feature since agriculture began in Southern Africa but the 1980s and 1990s saw particularly severe droughts" (Whiteside, 1998, p. 26). Risks in agriculture need to be confronted and dealt with because agriculture is the mainstay of most economies in Sub-Saharan African countries and this resonates with Whiteside's arguments that risks need to be understood before improvements to farming systems are suggested; under-investment in technology or management may be a result of being unwilling or unable to take risks; and that risks and the associated shocks may undermine sustainable rural livelihoods (Whiteside, 1998, p. 27). Temu, Mwanje and Mogotsi (2003) specifically pointed out that there was under-investment in training farmers and that tertiary agricultural education was not strategic enough to meet the needs of farming communities. Another risk faced in agriculture is associated with HIV and AIDS which erodes labour and human ability to work the fields. Temu et al. (2003, p. 16) noted that HIV/AIDS is "also impacting on tertiary education institutions, causing the loss of young as well as senior educators. Unless serious actions are taken to mitigate the impacts of HIV/AIDS, African colleges and universities will fail to produce future generations of scientists and development workers". Ncube (1999) identified the impact of HIV/AIDS on agriculture and farmers as loss of income through: attending funerals; uncultivated land through labour shortage, inputs and draught power; sale of livestock and assets to meet medical and funeral expenses; and through poor management of crops and livestock as skill and labour is directed away from agriculture towards tending the sick. Similarly, Muchunguzi (1999) noted:

The prevalence of HIV/AIDS is affecting the passing on of these [agricultural] skills and knowledge because farmers are dying at a young age... If the rate of deaths continues, the skills and knowledge about home gardening will become scarce. The knowledgeable and skilled farmers will be difficult to replace because it took them a long time to gain such experiences. (p. 38)

Boehm (2002) noted that the life of farmers in Lesotho is characterised by risk and uncertainty, with three main kinds of uncertainties: livelihood uncertainty which is determined by international labour and capital markets; ecological uncertainty which is concerned with variation and disequilibrium in ecological systems; and knowledge uncertainty, which is concerned with knowledge being always situated, contested, plural and partial. Box 2.1 below gives the background to livelihood uncertainties in Lesotho, one of the countries in which this study is located.

Box 2.1 The history and evolution of livelihood uncertainty in Lesotho

During the second half of the 19th century the Basotho were exporters of grain to the Kimberley mines in South Africa. In 1873, they exported 100,000 bags of grain alongside other agricultural produce such as mohair and wool. One of the most important reasons for the decline in agricultural production in Lesotho was the employment of Basotho men in South African mines, leading to the completion in the 1930s of the transition of Lesotho from a „granary to a labour reserve“. The other reasons for decline of agriculture are soil erosion, population pressure, maize mono-cropping, pests and the loss of the West of the Caledon River following the Basotho-Boer wars of 1858 and 1865.

The Basotho invest little in agriculture because it has lower returns compared to other economic activities such as working in the mines. In addition, the food prices are relatively low compared to the production costs. Also, the attitude of rural people in Lesotho is that farming is a domestic and female chore rather than a real profession. Men’s ambition lies outside agriculture, having being forced off land by wars, pests and droughts. The risk associated with investing money in agriculture when there could be a drought or frost or hailstorm that will destroy the crop discourages farming in Lesotho.

(Adapted from Boehm, 2002)

The Africa Commission (2009, pp. 18-19) attributed the agricultural problems facing Africa to four main shortcomings: insufficient government capacities to channel and coordinate resources for agricultural growth and development; insufficient focus on encouraging the value chain approach; inadequate research, training and extension services; and low investment in agricultural development, discrimination against women in accessing land, credits and markets.

2.3.1 Food crisis

In the first six months of 2008, there was increasing evidence of and unease about an emerging food crisis in some parts of the world, including Africa. This crisis is partly attributed to the recent steep increase in global food prices. According to Angus (2008), between March 2007 and March 2008, prices of cereals increased by 88%; oils and fats by 106% and dairy products by 48%. The World Bank states that in the three years ending in

February 2008, global wheat prices rose by 181% while overall global food prices went up by 83% (Angus, 2008). Versi (2008, p. 15) notes that wheat prices rose by 77 % in 2007 alone, and rice by 16 %; and between January and June 2008, the price of rice and wheat rose by further 114 % and 25 % respectively.

The 2008 food crisis has a history in Africa, where progress to reduce malnutrition has been slow. Studies conducted by the United Nations Food and Agricultural Organisation (FAO) reveal that Africa has the highest percentage of malnourished people at over a quarter. The percentage is even higher in southern Africa compared to the continent's average, though decreasing to 40 % in 2000-2002 from 48 % in 1990-1992 (African Union, 2006). Altogether, there are about 210 million under-nourished people in Africa (AU, 2006; Wiggins, 2008, p. 10). Part of the explanation for the food production deficit is that the population growth rate of Sub-Saharan Africa (SSA) is increasing at 3 % while that of food production is growing at 2 %, largely from putting more land under agriculture (Versi, 2008, p. 22) and the other is that a good part of African agriculture is export-oriented. The Southern African Development Community attributed some of the reasons for poor agricultural production to poverty. SADC (2008) explained that 45 % of people in southern Africa live on less than one US dollar a day, which makes its people unable to buy enough food. HIV/AIDS (an average adult infection rate of 25%) further reduces food security as many of the agriculturally productive population either get sick or tend to the sick. UNEP/GRID-Arendal (2006) concluded that in southern Africa, one in every five people working in agriculture will die before 2020, seriously undermining the region's capacity to produce food. Surging oil prices, which mean higher freight charges for goods from Africa to the North is another major constraint to agricultural productivity, while consumers also have to meet rising energy-related costs (Versi, 2008, p. 16). The Consultative Group of International Agricultural Research (CGIAR, 2005) report stated that about 40 % of Africa's export returns come from agriculture. Africa spends between US\$15,000-20,000 million annually on food imports apart from the US\$2 million it receives in food aid (UNEP, 2006, p. 83). In addition, horticultural exports from Sub-Sahara Africa bring in US\$2,000 million, which is 4 % of the global total (UNEP, 2006, p. 84).

2.3.2 Low and declining levels of arable land

The low percentage of arable land, which is only about 10.6 % of the land (UNEP, 2006, p. 78), is a key agricultural challenge in Africa and this is further worsened by soil erosion. On average, Africa produces less food per unit area than other continent partly due to land degradation and loss of soil nutrients (Versi, 2008, p. 21). Estimates of soil erosion vary spatially and also according to author. They range from 30 kg to 60 kg per hectare (ibid., p.

22). For example, one study noted that there were about 6,900 *dongas*⁵ in 1988, in Lesotho covering a land area of some 60,000 hectares and representing a total soil loss of 0.7 million tons per annum; and far more serious in the case of surface sheet erosion, which causes an estimated loss of 40 million tons of soil per annum (Lesotho Government, 1988). Lesotho is only 30,355 square kilometres. Varied as the figures may be, the underlying issue is that soil erosion is a serious issue in Africa. Keely and Scoones (2003, p. 43) argued that Africa should look at soil improvement as a primary focus for improving agriculture to get out of the food security trap in the same way that high yielding varieties have helped Asia. The Convention to Combat Desertification was formed in 1996, partly to respond to issues of soil erosion in Africa and to other forms of land degradation (Keely & Scoones, 2003, p. 40). The metaphor of soil as capital, which is shrinking and needing investment in order for it to produce more, has been used to replace soil mining that is associated with erosion and degradation. All this raises questions of ecological sustainability. Shortage and poor quality of land have been the cause of many wars in Africa (Maathai, 2009), a further serious risk.

2.3.3 Peak oil and implications of food security

Social science issues are receiving attention in climate change science and activism (e.g. Schipper and Burton, 2009; Worth, 2009). One of the most hotly debated justice-related issues at the moment is the biofuel colonisation of rural African lands (Havenevik, 2007), which resulted in the increase of food prices. (Lotz-Sisitka, 2010, p.72)

Oil supplies are set to level out and decline at some stage. This will result in more limited availability as well as in the sharp increase of prices, which will undermine carbon-driven agriculture that depends on oil for making fertilizers, agro-chemicals and for transporting inputs and produce.

The finiteness of fossil-based oil has forced people to search for alternative energy sources. While the pursuit of alternative solutions is in itself a noble enterprise, it has resulted in a growing emphasis on agro-fuels that in turn has meant the diversion of food products towards energy production. Commenting on this phenomenon, Robert Zoellick, the World Bank president noted that consumers in the rich countries are concerned with „filling their tanks“ while those in the poor countries are worried about „filling the stomachs“ (Versi, 2008, p. 15). About 250 kilograms of wheat (equivalent to 1,000 kilocalories), which is enough to feed one person per year, produces 100 litres of ethanol (ibid., p. 21). The United States, which produces 70 % of the maize that is traded on the world market, is converting about 25 % of its production into fuel (Ericsson, 2008, p. 12). Elsewhere, the point has been made that considerable amounts of food go to livestock feed, which could be a more direct form of

⁵ 'Dongas' is commonly used in many countries of southern Africa to refer to gullies.

protein intake in people's diets. This raises a social sustainability question of modern industrial agriculture which produces crops as commodities. Angus (2008) made a similar point when he noted that the food crisis is more than a mere technical problem since globally, there is more than enough food to feed all people – the problem is social and political because this food is inaccessible to the millions of people who need it. He further explained that the food industry is not organised to feed the people but rather to make profit for corporate agribusiness. According to an FAO report of 2003, there is enough food for everyone even in Africa, but some people are too poor to access it (Wiggins, 2008, p. 10).

In 2008 alone, 40 million people were pushed into hunger worldwide because of increased food prices, bringing the total number of the malnourished to 963 million, and 907 million of the malnourished in 2007 lived in the developing countries (FAO 2008 in UNESCO, 2009), meaning only 16 million lived in developed countries.

2.3.4 Climate change

Climate change puts agriculture at great risk. Many developing countries could lose over a fifth of crop production, with serious food security consequences, while developed countries could see significant agricultural production gains. (Fischer, Shah, van Velthuisen & Nachtergaele, 2001, p. 22)

According to the International Trade Centre and the Research Institute of Organic Agriculture (FiBL), agricultural land use contributes about 12 % of greenhouse gases which contribute to global warming and climate change (2007, p. iv). The report further noted that agriculture not only contributes to climate change but is affected by it. The irony of the gains and benefits is that the developed countries that contributed 75 % of the greenhouse emissions (Fischer et al., 2001, p. 28) are also going to benefit from this ecological „bad“ in terms of agricultural production while the developing countries will pay for it. The same report (Fischer et al., 2001) identified eastern and southern Africa as hot spots that will be negatively impacted on (see Figure 2.2). Similarly, the Research Institute of Organic Agriculture (2007, p. 1) pointed out that “the inequity in food supply between industrialised and developing countries is expected to increase, as the 40 % poorest countries in the tropical and subtropical zones will suffer most from droughts and periodic floods”. The other vulnerable regions are high mountain areas (ibid.) and these would include Lesotho in the SADC region. Ndungane (2009, p. 21) pointed out that the costs of adapting to climate change in Africa would be between 5 % and 10 % of countries’ gross domestic product. “Climate change also negatively affects agriculture, the largest sector of most African economies and a principal source of livelihood and food security. Droughts, a perennial problem for African farms, are increasing in intensity and frequency” (Ndungane, 2009, p. 21). J. Worth (2009, p. 3) argued that climate change causes three kinds of injustice: it affects the poorest first and worst; those

most affected are the ones who did not cause it and are not capable of halting it; and those who caused climate change through pollution are not paying for it. Annan (2009) made a similar observation:

Tragically, it is the poorest and least responsible countries who are having to bear the brunt of the climate change challenge as rising temperatures exacerbate poverty, hunger and vulnerability to diseases ... a successful deal [on climate change] could incentivise not only good stewardship of forests and more sustainable land use, but also massive investments in low-carbon growth. (p. 21)

Small scale farmers in southern Africa are among the worst affected by climate change. Stoop and Hart (2005) pointed out that one of the issues faced by smallholder farmers in developing countries includes high levels of risks under climate change as farmers are dependent on seasonal rainfall; and these are worsened by poor infrastructure, isolation, and fluctuating market and trade conditions. And because of these natural and economic uncertainties, farmers have to continuously adjust and even improvise their practices. Their practices tend to optimise limited local resources while at the same time minimising risks of crop failure (ibid., p. 207).

In 2007, the Intergovernmental Panel on Climate Change predicted that in Africa by 2020, between 75 million and 250 million people will be exposed to increased water stress. Agricultural production and access to food, in many countries will be severely compromised by climate variability and change (UNESCO, 2009). Similarly, CGIAR (2005), African Union (2006) and SADC (2008) noted that one of the most important risks facing agriculture is climate change which manifests itself in natural disasters such as droughts and floods. The average incidence of serious drought has increased from seven serious droughts during the period 1980-1990 to ten during the period 1991-2003 (African Union, 2006, p. 10). FAO (in UNEP/GRID-Arendal, 2006, p. 28) notes that drought has largely contributed to the tripling of the frequency of food emergencies over the last two decades. The impacts of global warming, a feature of climate change arising from carbon emissions, include: increased frequency of natural disasters; rising sea levels and floods that could threaten settlements and agriculture; and prolonged droughts (Vyas, 2007, p. 14). Climate change causes both less rain and higher temperatures resulting in increased evaporation, which will reduce further the amount of rain water available to agriculture. Research in southern Africa shows that a 2 % increase in temperature would reduce precipitation by 10 % and result in a 34 % decline in reservoir inflows (“Drought and Deluge”, 2007, p. 78). Rain-fed agriculture in some African countries could halve and up to 250 million people in Africa are likely to face water shortages by 2020 (Vermuelen, Dossou, Macqueen, Walubengo & Nangoma, 2008). Projects by the International Panel on Climate Change show that much of southern Africa will experience 20 % or less rainfall in the next few decades (see Figure 2.2). Adaptation capacity, particularly

to energy challenges and changing weather patterns affecting agricultural production will become new imperatives for good development, which has implications for learning processes in southern Africa (Lotz-Sisitka, 2008b, p. 5).

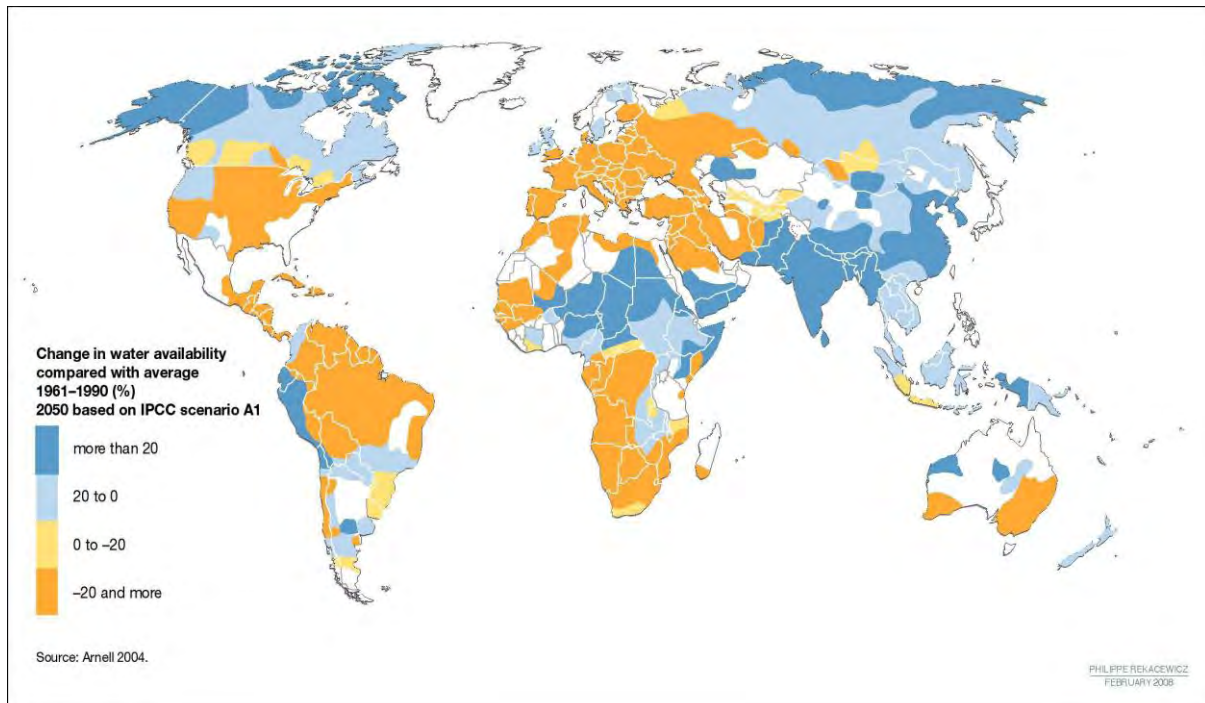


Figure 2.2: Map showing the global effects of climate change on rainfall

Source: UNEP/AGRID-Arendal, 2009

In April 2008, the International Assessment of Agricultural Science and Technology for Development (IAASTD), an initiative of the United Nations Food and Agriculture Organization and World Bank, whose mandate came from the World Summit on Sustainable Development held a meeting to acknowledge that modern agriculture is causing a large footprint through its contribution to climate change and degradation of natural resources, as well as to biodiversity (Kiers et al., 2008). It further noted “production increases have not consistently improved food access to the world’s poor. Where production has been intensified, it has been generally accompanied by costs such as extensive eutrophication from fertilizer runoff, pesticide contamination, and loss of local landraces” (ibid., p. 320).

2.3.5 Sustainable agriculture as an adaptive response to climate change

One of the main strategies to respond to climate change risks is climate change adaptation. The Intergovernmental Panel on Climate Change (in Research Institute of Organic Agriculture, 2007, p. 17) defined climate change adaptation as “adjustments in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities”. O’Farrell, Anderson, Milton and Dean

(2009, p. 34) noted that adaptation is a long term response that involves considerable change in life styles and livelihoods.

The promotion of Organic Farming has been one of the ways in which sustainable agriculture has been used as a response to sustainability issues being faced in agriculture. A review of 114 organic agriculture projects involving 1.9 million farmers in 24 African countries which was conducted by the International Centre for Research in Organic Systems revealed that agricultural production doubled while at the same time the market for organic produce was growing steeply (Africa Commission, 2009, p. 24). This makes this study's focus on Organic Farming as one of the three forms of sustainable agriculture, potentially strategic.

One of the responses to climate change is the creation of climate resilient communities (Vyas, 2007, p. 16). Africa cannot afford to miss the opportunity to follow a low carbon path, whenever this option is affordable and economically efficient by striking the balance between broadening energy access, sustainable management of natural resources and reducing energy intensity (Vyas, 2007; Africa Commission, 2009). One of the recommendations made by Vyas (2007) was the empowerment of communities to take part in climate change vulnerability assessments and to have full access to relevant information, as well as to use local coping knowledge and practices and to build on it (p. 18). As a response to climate change, SADC recommended that member states should do relevant research, for example, breed cultivars that are tolerant to more carbon dioxide, in response to climate change. It also recommended that more development assistance should go towards sustainable agriculture (Hulme, 1996, pp. 86-87). Pretty (2002) suggested that sustainable agriculture projects in Africa and elsewhere have demonstrated the capacity to produce more food at four levels: intensification of a single component of the farm system (such as vegetables) with little change to the rest of the farm; better use of natural resources on the farm, especially water and land by harvesting and reclaiming respectively; addition of a new productive element to the farm (such as agro-forestry); and introduction of new regenerative elements (such as nitrogen fixing plants, integrated pest management and new and locally suitable varieties of plants and animals) (p. 83). He cautioned:

It is critical that sustainable agriculture and conservation management do not prescribe concretely defined sets of technologies and practices. This only serves to restrict the future options of farmers and rural people. As conditions change and as knowledge changes, so must the capacity of farmers and communities to enable them to change and adapt, too... Sustainability should be seen as a process of social learning. This centres upon building the capacity of farmers and their communities to learn about the complex ecological and biophysical complexity in their fields and farms and then act on this information. The process of learning, if socially embedded and jointly engaged upon, provokes changes in behaviour and can bring forth a new world. (Pretty, 2002, p. 156)

Pretty (2002) further suggested that social learning fosters innovation and adaptation of technologies that are embedded in individual and social transformation and that self-learning is vital for sustainability. He further notes that farmers' experimentation increases their own awareness of what does and does not work. Discussing the role of learning in sustainable agriculture, the United Nations Environment Programme (UNEP 2006, p. 479), noted that collective learning and adaptive management are management practices to handle complexity and uncertainty. Indeed, indigenous knowledge systems distilled from centuries of observation and continuous interaction between the changing social and environmental conditions, are an important resource for many rural people (ibid., p. 10). During a workshop on *Advancing Agriculture in Developing Countries Through Knowledge and Innovation* held in Addis Ababa, Ethiopia in April 2008, the International Food Policy Research Institute (IFPRI) said that under the prevailing conditions of high global food prices, new initiatives to accelerate agricultural innovation and improve small scale farmer access to technology, inputs and markets are vital in developing countries. IFPRI further urged universities and research bodies to encourage students to talk with farmers and find ways of linking indigenous knowledge with education and to make research more responsive to the needs of the farmers (Ogodo, 2008). Social learning is more inductive, messier and more about dealing creatively with contextually specific situations than dealing with general laws of application in multiple situations. This study therefore searched for and worked with social learning theory. In the next section of this chapter, I review the social learning processes that are being used in agricultural extension, and to an extent, natural resources management (see Section 2.3.6).

Adaptation therefore remains a key response to global risks, especially those associated with climate change such as agricultural research, learning and development, which is the focus of this study. Elmqvist (2008) in Lotz-Sisitka, (2009b) noted that adaptation is a process associated with socio-ecological resilience, which means the ability to withstand shocks and return to the original state and the capacity of people in socio-ecological systems to manage resilience through collective action, and transformability as the capacity of people in a socio-ecological system to create a new system. The exploration and intended expansion of learning processes in sustainable agriculture workplace contexts in this study sought to contribute to adaptation as discussed here.

2.3.5.1 Some Pan African responses to agricultural crises

At the Pan African level, there are several processes that are going on and which also suggest that sustainable agriculture is one of the answers to the risks and uncertainties that the continent is experiencing, especially in relation to climate change, peak oil, global agricultural prices and policies. Over the last two decades, African countries have been focussing on some of the agricultural issues that the continent is facing. The Maputo

Declaration of the African Union called on Member States to: adopt sound policies on agricultural and rural development; prepare collaborative bankable projects under the New Partnership for Africa's Development (NEPAD) Comprehensive Africa Agriculture Development Programme (CAADP) for the mobilization of resources; and allocate at least 10 % of their national budgetary resources to the agricultural sector by 2012 (AU, 2006; Borger, 2008). It also called for: the active participation of all the key stakeholders at the national and regional levels in all aspects of Africa's food and agricultural production, as well as the establishment of food reserve systems that are based on regional and sub-regional food self-sufficiency to fight hunger and poverty (AU, 2006). The AU/NEPAD CAADP has four mutually reinforcing pillars: expansion of the area under sustainable land management and reliable water control systems; improvement of rural infrastructure and trade-related capacities and market access; increasing food supply and reducing hunger by accessing improved technology so as to enable small farmers to play a major role in increasing food availability close to where it is most needed; and agricultural research, technological dissemination and adoption to sustain long-term productivity growth (AU, 2006). The AU/NEPAD Environmental Action Plan also provides for activities that combat land degradation and desertification; conservation and sustainable use and management of marine, coastal and freshwater ecosystems; and combating climate change (AU, 2006). The Sirte Declaration on Agriculture and Water that was made by African Heads of State in Sirte, Libya in February 2004 called for the enhancement and/or establishment and continental coordination of early warning systems to avert the negative impact of desertification, natural disasters such as droughts and floods and pests. It further calls for the establishment of information networks for agricultural production and food security and input and output marketing (AU, 2006).

One of the challenges in agriculture is that women have traditionally been excluded from certain jobs and very few have been trained in agriculture. The Africa Commission (2009, p. 19) noted that "in Sub-Saharan Africa, agricultural productivity can increase by up to 20 percent if women's access to resources such as land, seed and fertilizers is equal to men's". Women in Sub-Saharan Africa are "key farmers, food producers and natural resources managers" (IIRR, 1998, p. 70). A Department of International Development Workshop on improving smallholder farmer productivity in southern Africa, attended by 115 policy makers, researchers, practitioners and private sector representatives in 2005, identified gender as one of the five agricultural research issues (Goldman, 2005, p. 5). The Africa Commission, which was established in 2008 to help Africa benefit from globalisation, identified five priority areas, two of which have a direct bearing on sustainable agriculture: Sustainable Energy and Post Primary Research and Education (Africa Commission, 2009). The Sustainable Energy Initiative aims to "stimulate and expand the emerging market for sustainable energy, primarily in rural areas by strengthening the role of small and medium-

sized enterprises in delivery and productive use of energy from local and renewable energy sources” (Africa Commission, 2009, p. 90). The issue of energy became a central area of concern in one of the case studies in this research (see Section 7.2.4.1). Post Primary Research and Education has two tracks: technical and vocational skills development that is also gender sensitive focused at improving traditional apprenticeship and community-based technical and vocational skills training in rural areas. The second track focuses on linking university education, research and business in sustainable agriculture through supporting the development of collaborative programmes between universities, research institutes and the private sector to foster innovation; development and implementation of innovative and contextualised graduate and post-graduate courses; and facilitating the sharing of experiences, resources and knowledge among tertiary institutions and the private sector (Africa Commission, p. 55). This response is concerned with learning and innovation but it does seem to exclude the farmers themselves in the knowledge generation process and seeks only to bring them in as “agricultural value chain actors to ensure suitability” of research and learning (Africa Commission, 2009, p. 73). The next subsection discusses how NGOs and farmer groups have been responding to some of the sustainability issues in Africa and the SADC region.

2.3.5.2 Civil society responses

One of the major civil society responses addresses the issue of equity. This focuses on shifting from the notion of food security (because simple access to food is inadequate) to *food sovereignty* that encompasses access to land, water, and resources. Food sovereignty requires that affected people have the right to know about and to decide on the food, agricultural and land policies that are socially and economically appropriate to their unique circumstances (UNEP/GRID-Arendal, 2006). This is supported by Thompson (2007) who proposed food sovereignty as the kind of green revolution that Africa needs. Civil society organisations in southern Africa have already begun grappling with the practicalities of food sovereignty through identifying the different forms of sustainable agriculture as essential building blocks for food sovereignty (PELUM South Africa, 2008). Sustainable agriculture practices include organic agriculture, Permaculture, low external input agriculture, local/indigenous knowledge, farmer field schools, watershed management and joint forest management, holistic management and conservation farming (Wilson, 1999; Mukute, 2001). At a Pan African level, the establishment of the Economic, Social and Cultural Council of the African Union in 2005 signalled willingness by governments to engage civil society organisations. The council is made up of selected representatives from civil society organisations that report directly to the Heads of States (Maathai, 2009, p. 158). Global events such as the Rio Summit, the World Summit on Sustainable Development, the World Food Summit and the Social Summit have been used to build civil society connections and to engage with global issues that have regional and local impact. Learning and innovation initiatives that have come

through civil society initiatives include Promotion of Local Innovation (see Section 2.5.5.1), among others.

2.3.6 Agricultural research and extension issues

Linkages between farmers, extension agents and research systems in Africa are weak. Often researchers have little interaction with extension services and farmers, and do not reflect their priorities in the research agenda. In some cases, the national research programme is defined by donors or individual researchers and may have little relation with national objectives or farmers' needs. (NEPAD, 2003, p. 62)

NEPAD (2003) further argued that small farmers lack ways to reduce risks of adopting new technologies and that the financing of research and extension in Africa was inadequate and unsustainable. It therefore recommended the doubling of annual spending on agriculture within 10 years, meaning an annual average increase of 7.2 %. In the next subsections (under this section 2.3.6), I discuss some of the specific and related agricultural research and extension issues currently faced in the region.

2.3.6.1 Underinvestment in agriculture

Public spending on farming in Africa, as a share of total public spending, fell by half between 1980 and 2004 (Borger, 2008). World Bank support for agriculture fell from 32 % of total lending in 1976-8 to 11.7 % in 1997-9 (Borger, 2008). In 1986, 20 % of foreign aid from rich to poor countries was spent on agriculture but 20 years later, the percentage has dropped to a mere 3 % (Borger, 2008, p. 36). Even the African governments are currently spending only 5 % of their budgets on agriculture (Borger, 2008, p. 36), although there have been recent commitments to address this through NEPAD initiatives. Market liberation under the Structural Adjustment Programmes in the 1990s forced governments to cut on provision of social services and subsidies. This has resulted in African governments and Civil Society Organisations arguing for Fair Trade since Western countries subsidize their own agriculture. These problems have been worsened by insufficient price incentives and corrupt marketing boards. Cheru (2002) noted that "Productivity decline is attributed to the absence of efficient research, extension and training opportunities. Although the importance of agricultural research is well recognised in official circles, there is no connection between basic research and adaptive research" (p. 90). The financial crisis is set to worsen the situation and to have an even greater negative effect on the developing world, underlining the need to "foster rural people's capacities and resilience to deal with today's challenges" (UNESCO, 2009, p. 1). Similarly, Basset and Crummey (2003) made a significant point about the training of environmental scientists in Africa, when they note that whether trained in the capitalist or socialist world, no or very little place was allowed for engaging local practical knowledge in research and learning programmes.

The problem of underinvestment in agriculture is not unique to Africa but the irony is that agrarian based economies have tended to allocate low proportions of their budgets to agriculture as noted by FAO:

And agricultural growth cannot be achieved and sustained without investing in agriculture. Unfortunately in countries where the socio-economic role of agriculture is largest, public investment in agriculture tends to be relatively very low. Public investment in agriculture as a percentage of agricultural GDP is lowest in agriculture-based economies (around 4 percent) and largest in urbanised developing countries (around 15 percent)... the problem of underinvestment is compounded during times of economic turmoil such as the current global economic slowdown. (FAO, 2009b, p. 39)

2.3.6.2 Competing agricultural research, extension and development approaches

Commenting on agricultural research and development in Africa Wangari Maathai, winner of the Nobel Peace Prize lamented:

If African states' agricultural extension services had not been underfunded or neglected in the decades since African nations became independent, this farmer not only might have learnt the right way to prepare the soil for planting, she also might have had access to information, modern equipment, and governmental support that would have enabled her to farm more efficiently and less destructively... If, in turn, development practitioners and international agencies had, in their work with governments, given more priority to investing in farmers, the continent's agriculture might not be in such poor condition today. (Maathai, 2009, pp. 15-16)

The role of the extension worker was that of communicator, linking the farmer and the researcher. However, research elsewhere has been suggesting the need to focus on the needs and interests of the farmer in a manner that enables her to prosper and become self-reliant.

According to S. Worth (2006) workplace learning in agriculture is facing disturbances: agricultural and educational policy underline process and learning driven extension while those implementing the training are still operating in the technology transfer mode. He attributed part of this mismatch to the content of the extension worker training and more importantly to their job descriptions which puts emphasis on technology transfer. Historically, southern African research and extension systems were built on the Research-Design-Disseminate-Assimilate approach although some changes have happened over the last few decades. Leeuwis (2004) noted that one of the key assumptions of the Research-Design-Disseminate-Assimilate approach was that scientists did the research and design, extension workers disseminated and farmers consumed. This was in spite of the fact that sometimes scientists got their ideas from farmers and also that farmers made their own innovations and adaptations. Consequently, very little or no research has been done on how scientists adopt from farmers. He further noted that participatory extension is inhibited by lack of bridging material or theory to link the old school of extension and the new (Leeuwis 2004, p. 281). Subsequent sections of this chapter examine the evolution of agricultural research and

extension both globally and in southern Africa. This discussion enables me to locate the temporal space in which this study was conceptualised and implemented. But the distinctions are not that neat because there is considerable overlap between the approaches as well as between the times during which they happened. This is why Leeuwis (2004, p. 281), noted the duality in the discourses in agricultural extension in Zimbabwe: one being participatory and corresponding methodologies and the other being „adoption and diffusion of innovation“. This observation holds true for southern Africa agricultural research and extension systems. Similarly, in his arguments for sustainable agriculture Rukuni (1994) identified the following factors as central to the achievement of sustainable agriculture development:

- New technology developed locally or outside and adapted to local situations;
- Human capital in the form of professional, managerial and technical skills produced by investment in schools, agricultural colleges, faculties of agriculture and on-the-job training and experience;
- Sustained growth of biological capital and physical capital;
- Improvements in the performance of research and extension, credit and marketing, and settlement; and
- Favourable economic and political environment (Rukuni, 1994, pp. 2-3).

At the centre of Rukuni’s observations is the need to develop and provide the necessary research, training and extension and associated tools; the need to build the natural resource base; and, the development of an enabling economic and political environment for sustainable agriculture to establish roots and flourish. These issues are still of concern in southern Africa today and they require a change oriented approach to learning if they are to be addressed comprehensively.

2.3.7 Agricultural research and training organisations and priorities in selected southern African countries

Some idea of government research and extension institutions and priorities is useful as part of locating the research context. The table below (Table 2.1) shows the main government actors in agricultural research and extension and some of their work in the countries where this study was conducted: Lesotho, South Africa and Zimbabwe.

Table 2.1: Public agricultural research and extension institutions and their priorities

Country	Institutions involved in agricultural research and training	Agricultural research and training priorities
Lesotho	<ul style="list-style-type: none"> • National University of Lesotho: Faculty of Agriculture – offers training at under- and post- graduate levels. • Ministry of Agriculture and Food Security: Lesotho Agricultural College – trains agricultural extension staff at certificate and diploma levels. • Lerotholi Polytechnic Institute – offers technical, vocational and commercial training and has potential to become a university of technology in Lesotho. 	<ul style="list-style-type: none"> • Diversification of options for the creation of sustainable livelihoods for the poor; • Conservation farming and organic fertilizer use in small scale agriculture; • Genetics of aquaculture species; • Trans-boundary water issues; • Comparative studies of farming systems; • Effects of climate change on agricultural production; • Screening new cultivars for environmental adaptation • Management of dairy goats; and • Development of appropriate farm machinery.
South Africa	<ul style="list-style-type: none"> • The Department of Science and Technology is mandated to develop science policy and research strategies. • The Ministry of Agriculture is responsible for the development and implementation of agricultural strategies. • The Agricultural Research Council institutes are responsible for research; the universities are responsible for research and training; and the provincial agricultural colleges are mandated with practical training and technology diffusion. • The four leading universities involved in agricultural research are University of Pretoria, University of Free State, University of KwaZulu Natal, and University of Stellenbosch. In addition to these four, the others, which are leading in agricultural training, are University of Fort Hare, University of South Africa, Cape Peninsula University of Technology, University of North West, University of Venda and the Grootfontein Agricultural Development Institute. 	<p>The Strategic Plan for Agriculture does not have clear priorities. However, the following are implied:</p> <ul style="list-style-type: none"> • Enhancement of the capacity of farmers to use resources sustainably; • Conservation of agricultural biodiversity; • Development of more robust farming systems for improved soil management and water use incorporating production and sustainability; • Development of plant breeding strategies; • Conservation of endangered species and cultivars; • Development of biotechnology (strategy); and • Development of horticulture.
Zimbabwe	<ul style="list-style-type: none"> • Department of Agricultural Research and Extension, which is responsible for agricultural research in crop and pastoral production and well as for the provision of extension. It has 16 research institutes. • The Agricultural Research Council which is responsible for coordinating research in the country. • Five universities offer training in agriculture and these are University of Zimbabwe; Africa University; Bindura University of Science Education; Midlands State University; and National University of Science and Technology. • Six agricultural training colleges, which offer certificate and diploma training; and two technical colleges and 14 youth training centres which offer training in agriculture. 	<ul style="list-style-type: none"> • Improve viability of farming; • Improve access to new and existing technologies; • Improve soil fertility, reverse land degradation and increasing farm productivity; • Improve access to credit and other support services; • Draft and review curricula; • Provide farmer training; and • Conduct agro-ecological based research.

Source: SADC-FANR, 2008

In addition to the research and extension institutions, South Africa had developed a comprehensive system for supporting learnerships through partnerships between labour, government and employers through establishing sector education and training authorities that oversee skills development in their respective spheres. These operate under the auspices of the South African Qualifications Authority and within the National Qualifications Framework. The authority which is responsible for agriculture is called Agricultural Sector Education and Training Authority (AGRISETA). The box below (Box 2.2) summarises the priority skills that were identified in the sector.

Box 2.2 Priority skills in needs in South Africa's agriculture

The four main target groups for AGRISETA are: the commercial farming sector which employs 925,000 workers; the emerging farmers sector, which has about 650,000 farmers; the upstream and downstream agricultural enterprises which employs 300,000 people; and the Department of Agriculture, especially the extension officers (AGRISETA, 2006, p. 5).

Some of the priority skills in the commercial agriculture sector are: the need for adult basic education and training programmes to improve the educational base as most employees are semi-literate; management and entrepreneurial skills for farm owners and workers, food safety and quality, including organic farming (ibid., p.6). The priority needs among emerging farmers are concerned with entrepreneurial and business skills, technical and production knowledge skills, marketing and processing skills. Lack of transport and infrastructure are barriers to marketing (ibid.). In the Department of Agriculture, one of the priority areas is to upgrade and retrain a large number of extension workers (ibid.). Agricultural skills suppliers in South Africa are: about 150 secondary schools who offer agricultural subjects and 30 specialised Agricultural colleges offering training at GET [General Education and Training]; 11 Agricultural Colleges (enrolment capacity of 1,500 learners; and 50 FET [Further Education and Training] Colleges (enrolment capacity of 400,000 students) offering training at FET level; and 6 Universities of Technology and 8 universities that offer agricultural programmes. There are also 120 accredited providers offering a range of learnerships and skills programmes and their combined capacity is to offer 25,000 learning opportunities per annum. About 50 % of the total workforce attends workplace learning according to Annual Training Reports (ibid., pp. 6-7). Although the supply side of agricultural education and training has sufficient training and education capacity, there are concerns about relevance and quality. One of the proposed strategies for addressing this is “decentralised training to take training on-site and to farms (also the need for a mentorship approach to the training, especially of emerging farmers)” (ibid., p. 7).

“Although there has been a significant increase in the overall competitiveness of the agricultural sector, this has not happened uniformly. The smaller and emerging farmers and businesses are not experiencing benefits of revitalisation. In most instances they struggle to move out of the survivalist pattern of operation. The primary reasons for entrapment include:

- Lack of farm management skills (including financial skills).
- Lack of marketing management skills.
- Lack of resources to move out of the survivalist and poverty spiral ... Very few have an understanding of the capacity they can leverage within unions, commodity organisations and government.
- Insufficient technical information to make appropriate product decisions.
- Lack of sufficient support services such as extension services” (ibid., p. 31).

The identification of institutions was helpful in terms of suggesting where to obtain information as well as where the results of the study could be disseminated. The priorities

were useful in terms of enabling me to see how my study could link with them. In the case of South Africa, this link was provided by the SAQA-Rhodes University programme. What I concluded from the priorities is that sustainable agriculture is becoming a priority in all three countries under examination and that agricultural extension training requires renewed attention in all three areas.

2.4 INTERNATIONAL TRENDS IN AGRICULTURAL RESEARCH AND EXTENSION

Some of the most instructive works in agriculture and farmer learning have been developed by people such as Chambers, Pretty, Scoones and Thompson. In 2007, a workshop involving 79 agricultural practitioners, researchers, farmer leaders and donor representatives from 40 countries, including African states, reviewed the progress made towards putting the farmer first in agricultural development and research after 20 years of effort. In describing the workshop, Scoones, Thompson and Chambers (2008, p. 2) had this to say:

An important running theme of the workshop ...was politics of knowledge... this discussion highlighted the need to go beyond the conventional distinctions between indigenous and scientific, traditional and modern, local and global, practical and theoretical knowledge to a more integrative, hybrid version of contested, located knowledges, which are continuously in the making. Such knowledges may be made up of technical elements, but also, critically, cognitive processes. Knowledges too are both discursive („in the head“) and practical („in the body“), based on experiential, emotional and sensory sources. Equally such knowledges are both individually held (and therefore gendered) but also socially distributed, across networks, institutions and social movements.

One of the important outputs of the workshop was a framing of the evolution of agricultural research and extension globally, which is presented in the table below (Table 2.2). The framing of the stages is applied in this research with adjustments that are informed by the work of Whiteside (1998), who located his discussion in southern Africa.

Table 2.2: Approaches in agricultural research, development and extension

	Technology transfer	Farming Systems Research	Farmer First/Farmer Participatory research	People-centred innovation and learning
Era	Long history central since 1960s	1970s-1980s	From 1990s	2000s
Mental model of activities	Supply through pipeline	Learn through survey	Collaborate in research	Innovation network centred on co-development; involving multi-stakeholder processes and messy partnerships
Farmers seen by scientists as:	Progressive adopters and laggards	Objects of study and sources of information	Colleagues	Partners, collaborators, entrepreneurs, innovators; organized group setting the agenda, “the boss”

Scientists as seen by farmers	Not seen – only see extension workers	Used our land, asked us questions	Friendly consumers of our time	One of many sources of ideas
Knowledge and disciplines	Single discipline driven (breeding)	Inter-disciplinary (plus economics)	Inter-disciplinary (more, plus farmer experts)	Extra/trans-disciplinary – holistic, multiple culturally rooted practices
Farmers' roles	Learn, adopt and conform	Provide information for scientists	Diagnose, experiment, test, adapt	Empowered, co-generators of knowledge and innovation; negotiators
Scope	Productivity	Input-output relationships	Farm-based	Beyond the farm gate – multi-functional agriculture, livelihood, food systems and value chains across multiple scales from global to local; long time frames [sustainability]
Core elements	Technology packages	Modified packages to overcome constraints	Joint production of knowledge	Social networks of innovators; shared learning and change; politics of demand
Drivers	Supply push from research	Scientists' need to learn about farmer conditions and needs	Demand pull from farmers	Responsiveness to changing contexts: markets, globalization, climate change, organized farmers, power and politics
Key changes sought	Farmer behaviour	Scientist knowledge	Scientist-farmer relationships	Institutional, professional and personal change; opening space for innovation
Intended outcome	Technology transfer and uptake	Technology produced with better fit to the farming systems	Co-evolved technology with better fit to livelihood systems	Capacities to innovate, learn and change
Institutions and politics	Technology transfer as independent: assumed away	Ignored, black box	Acknowledged but sometimes naïve populism	Central dimensions of change
Sustainability	Undefined	Important	Explicit	Championed – and multi-dimensional, normative and political
Innovators	Scientists	Scientists adapt packages	Farmers and scientists together	Multiple actors, learning alliances

Source: Scoones, Thompson and Chambers (2008, p. 8)

From the above table (Table 2.2) it is clear that four main eras of agricultural research and development have been identified and described. The role of the farmer in the construction and use of knowledge evolved from that of being a consumer to being a source of knowledge, also moving from adopting technologies to adapting them and now to innovation. Sustainability has emerged to become a critical issue in more recent periods. The changes sought from agricultural extension changed from altering farmer behaviour in the first era to opening up spaces for innovation in the current and new approach. Table 2.2 is relevant to this research in that it has enabled me to consciously locate this study with its focus on social learning in the new research, development and extension era of people centred learning and

innovation without ignoring history. More importantly, the drivers of agricultural research and extension in the new era include risks associated with climate change and globalisation processes which are seen as necessary in developing reflexive ways of knowing and doing.

A similar conceptualisation of the evolution of farmer extension (excluding researchers) was discussed by Röling (1988) who identified three main models of agricultural extension which have taken place over time. These are the „dissemination model“ – top-down, the „problem solving model“ – bottom-up and the „social interaction model“ (Havelock, 1969 in Röling, 1988, p. 25). The diffusion model exists where an innovation spreads from unit to unit in a social system from the point of introduction. Extension workers used „progressive farmers“ as the points of introducing innovations and these reach other farmers indirectly through autonomous diffusion processes – “Diffusion works while you sleep”. This model was criticised for following the path of least resistance, neglecting those who needed the support most. It also lacked attention to structural variables (Röling, 1988, p. 25-27). Another problem associated with the diffusion approach was that farmers who did not adopt the innovation were treated as laggards even though some of them chose not to because it was not appropriate to their situations due to lack of resources or irrelevance. This led to what has been dubbed the „pro-innovation bias“ (ibid., p. 28). After realising that farmers were not homogenous, the extension system developed targeted messages or offerings to farmers who were similar in terms of access to resources, production objectives and opportunities. This implied adapting the message to the clientele. Both the extension methods and content had to be adjusted to suit different contexts. A Farming Systems Research based on marketing research concepts was developed to ensure that researchers developed products that were needed by their clients. Scientists met this change with resistance and little headway has been made in this regard (Röling, 1988). The last dimension of extension, as described by Röling, arose in relation to the realisation of the power dimension in knowledge utilisation. It did not focus on extension workers but rather on farmers in order to develop their capacity to claim what they wanted from service providers – thus providing the constituencies of countervailing force or power (ibid., p. 25-27). It is in this last mentioned model of social interaction that this research is located and to which it seeks to make a contribution.

2.5 AGRICULTURAL RESEARCH AND EXTENSION IN SOUTHERN AFRICA: HISTORY AND TRENDS

Whiteside (1998, p. 18) noted that the progression of approaches to agricultural research and extension in southern Africa broadly followed that of the rest of the world, as discussed in the section above. He categorised the approaches into four groups, namely, Technology Transfer Approach; Farming Systems Approach; Train and Visit Approach; and Farmer-First

Approach. This study combines the framings⁶ of Whiteside (1998) and Scoones et al. (2008) to develop five groups by adding: „People-centred Innovation and Learning“.

2.5.1 Transfer of Technology

The main assumption of this approach was that western scientific methods, knowledge and technologies were the key to progress in agriculture and that technologies that were successful at research stations would also be successful with farmers, including smallholder farmers (Whiteside, 1998, p. 19). It is this approach to agricultural extension that Swanson (in Pazvakavambwa, 1994, p. 104) defined as “the process of transferring information and technology to farmers for use in the production process and similarly transferring information from farmers to researchers to solve the problems of farmers”. This was the basis of the Green Revolution which was successful in Asia (notwithstanding critiques) in terms of increasing productivity, but not so successful in Africa. The technology transfer approach was therefore top-down, using mainly a research-design-develop-assimilate approach. The approach proved unsuccessful in much of the region because of various factors, including multiple agro-ecological conditions and the inability to afford the technologies. Pazvakavambwa (1994) noted that during the colonial era, this approach was both coercive and prescriptive. S. Worth (2006) commented that in South Africa, agricultural extension had long operated in a singular mode of technology transfer, conveying to farmers the latest technologies to improve production and success was measured by the rate of adoption. Stoop and Hart (2005) explained this approach as seeking to simplify complex situations to a few manageable ones in a typical reductionist approach. In order to address the gaps of this approach, others were explored including the Farming Systems Approach discussed below.

2.5.2 Farming Systems Research and Extension Approach

The Farming Systems Approach was based on an appreciation of the diversity and complexity of the smallholder farming system (Whiteside, 1998, p. 19). It was designed with numerous degrees of farmer participation (Stoop & Hart, 2005). This resulted in the attention being given to the kind of agro-ecological conditions as well as a shift from optimising the production of a single crop to understanding and utilising the different agro-ecological conditions on a farm. Intercropping was encouraged to exploit the different micro-environments, and farmers were encouraged to take on off-farm activities in addition for income generation. Western scientific methods, technologies and methods remained privileged in this approach, which grew in the 1980s and was widely promoted in the region by the United States Agency for International Development. Wilson and Mukute (2006) noted that this approach to farming grew out of systems thinking, where relationships

⁶ Rein and Schon (in Pimbert, 2009, p. 3) define framing as a way of selecting, organising, interpreting and making sense of complex reality to provide signposts for knowing, analysing, persuading and acting.

between parts are critical. They also pointed out the importance of understanding the local realities and connections, as well as the social and ecological and produced tools that are used to reveal these. These tools include mapping, transect walks, scoring, ranking and social mapping. Field research on farming systems recognised that farmers are capable of taking part in research and experimentation. This resulted in a better appreciation of farmer abilities and the complexity of farming systems of small scale farmers (Wilson & Mukute, 2006, pp. 15-16). However, it remained “highly technology-biased with the human aspect receiving relatively little attention” and the Farm Systems Research Teams being mainly composed of agronomists and economists; sociologists and anthropologists were rarely involved (Stoop & Hart, 2005, p. 209). This pointed to the need for a more inclusive approach, which was to be found in participatory research and learning. In the meantime, there was also another approach in which formal scientists moved into the field to meet with farmers and encounter their situations – the Train and Visit Approach described below.

2.5.3 Train and Visit Approach

This approach was promoted by the World Bank in the 1980s based on its perceived success in Asia. In spite of its participatory rhetoric, the Train and Visit Approach worked on the same assumptions as the Transfer of Technology Approach discussed above. Its main concepts were:

- Clear lines of command;
- Agreed messages;
- A set of programme visits;
- Demonstration plots by farmers;
- Two-way contact between contact farmers, extension workers and researchers; and
- A division between subject specialists and extension workers; and parallel systems of monitoring and evaluation (Whiteside, 1998, p. 18).

2.5.4 Farmer First Approach

Whiteside (1998) noted that this approach gained ascendancy in southern Africa in the 1990s and that there are several terminologies used to describe Farmer First Approaches. These include Farmer Participatory Research; Participatory Technology Development; Participatory Rural Appraisal and Participatory Learning and Action. Applied anthropology contributed to the First Approach by showing the importance of local knowledge, values, behaviours and perspectives in planning transformation and doing development (Chambers, 1997; Wilson & Mukute, 2006). The role of academia in this new approach was aptly summarised by a Vice Chancellor from a SADC university at a Southern African Development Community Conference when he said, “We are *emerging* from the ivory towers of the past and are collaborating with society and ourselves instead of observing the real world from a detached distance” [My emphasis] (Kamba, 1989, p. 5). I have emphasised emerging because that role

was still new and even today, the shift is still happening. Some of the assumptions that underpin this approach are:

- Farmers and farming communities are knowledgeable, especially about local conditions;
- Indigenous technical knowledge can be used with more recent forms of knowledge obtained from other sources;
- Farmers are largely rational and responding in their own interests to the diverse conditions in which they live; and
- The participation of farmers in identifying and overcoming their problems is essential (Whiteside, 1998, p. 20).

There are several tools used in Participatory Rural Appraisal and these include village social maps, village resource maps, trend analysis, matrix mapping, transects, seasonal analysis, daily activity profiles, institutional profiles and benefit analysis (Mukute, Munyulwa & Kimakwa, 2002, p. 17).

Box 2.3 below describes how one development NGO in Zimbabwe drew on local culture to work developmentally with rural communities in a manner that did not privilege one form of knowledge over another and which resulted in a number of international awards being given to the NGO.

Box 2.3: Drawing on Ndebele culture to do development better

The Organisation for Rural Associations of Progress (ORAP), was established in Zimbabwe in 1980. It won the Africa Prize for Leadership for Sustainable End of Hunger and later the „Alternative Nobel Prize“, the Right Livelihood Award and the We-the-50 Communities Award in the category of Food, Agriculture, Fisheries and Forests in the 1990s development). Its success has been attributed to its Z and Q concept (Dube, 2002), which draws on Ndebele culture. The Z stands for *Zenzele*.

Through *Zenzele*, people put into practice what they are and what they think. This encourages self-expression, self-esteem, and self-confidence, and enables people to learn from experience and to develop their practical skills and expertise. They channel their energies towards self-help. Only interdependence is encouraged ... Rural communities are encouraged to identify and define their problems and constraints, and using their culture, try to find solutions. As soon as this is done, ORAP, through its management structure, tries to provide educational, technical and financial support ... *Zenzele* is this a process of self-discovery, self-mobilisation, management and application for one’s own development and that of others that leads to social power” (Dube, 2002, pp. 71-72).

What is significant about the *Zenzele* concept in this study is its recognition of distributed cognition in rural development by bringing together lay and expert knowledges and ways of knowing. It addition, it makes an explicit link between learning and agency recognising at the same time individual, relational and collective agency. Q stands for *Qogelela*, meaning little by little, one day at a time, save, invest and mobilise resources. It involves building on progress achieved already (Dube, 2002) and can be linked with the Japanese concept of *kaizen*. In education this may be associated with the definition of achievable zones of proximal development and an acknowledgement that

transformations over long periods often take several short changes.

One of the songs sung by ORAP development practitioners and the rural people they worked with is:

Kusese duze kusese duze laphe siyakhona

Kude kukhatshana lape siyakhona

Chorus: *Amagixigo amagixigo enthuthuko*

Kukhona ameva matshe lamagodi

“Translated, the song says; „It’s nearer, getting nearer where we are going. It’s far, very far where we are going. There are thorns, stones and potholes. The chorus expresses the ups and downs one has to go through to achieve development” (Dube, 2002, p. 92). The song suggests that the development practitioners are conscious that they are working with a moving and complex object which cannot be fully grasped. It also suggests that they are aware of the resistance to learning and development which is typical in social learning processes that seek to be expansive (Engeström, 1987; 2008).

Wilson and Mukute (2006, p. 15) pointed out that one of the driving forces of participatory learning was the disillusionment with what Freire called the „banking“ model of education in which one „pours“ knowledge into someone as if they were a bank. Freire propounded the notion of self-awareness and self-help in the empowerment of the marginalised which has found expression in such present day concepts as Training for Transformation (Murwira, Wedgwood, Watson, Win & Tawney, 2000). Training for Transformation “discusses meaning of development, principles of transformation, approaches to community development, the psycho-social method and group dynamics,” (ibid., p. 53). The training has been effective in terms of democratisation of leadership and making decision taking more transparent (IIRR, 1998). Reid and Nickel (2008, p. 33) pointed out that “at the heart of participatory approaches lies „the promise of empowerment and transformative development for marginal people””. The main contribution of this approach to development appears to be the generation of self-awareness as well as awareness of structural constraints and enablers, which are an important basis for developing agency.

Another important approach that informed the Farmer First Approach was Participatory Rural Appraisal. Wilson and Mukute (2006) commented that Participatory Rural Appraisal which took root in southern Africa in the 1990s emphasised the role of outsiders as those of facilitators of local development. PRA arose in response to dissatisfactions with the biases in rural development, especially those against the poor and marginalised such as women.

2.5.4.1 Participatory agricultural learning

Participatory learning results in theory that is informed by action and action that is informed by theory. People learn from what they do, from their mistakes as well as from their successes. People learn from being with others, and from experiencing new situations. Participatory learning in rural development can bring the community members to an equal footing with development agents who are often outsiders, with more formal education. Whereas in conventional learning approaches there is the student and the teacher, the one who

does not know and the one who knows, in participatory learning, the communication and relationship is more horizontal, each partner knows something and each partner will contribute to the creation of new knowledge and to learning. (Mvumi & Mukute, 2006, p. 49)

Mvumi and Mukute (2006, p. 52-53) further suggested that in this approach the role of the development worker (extension worker or agricultural facilitator) should be to:

- Ensure adequate and fair representation of farmers;
- Provide training to farmers in specific research aspects;
- Conduct regular reviews of research priorities with the farmers;
- Stimulate and support farmer to farmer learning mechanisms; and
- Facilitate the scaling out of good practice.

The relationship between farmers, extension workers and researchers is summarised in the figure below (Figure 2.3). What is important to note here is that each stakeholder group has something unique to contribute and when these contributions converge, synergies are likely to be generated.

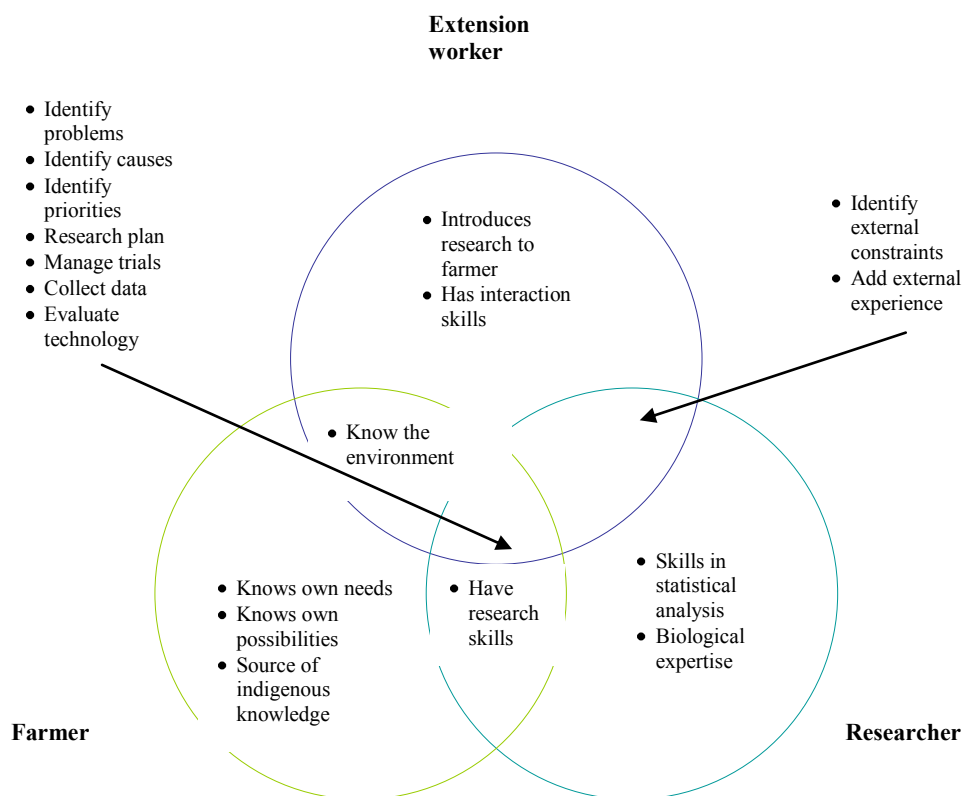


Figure 2.3: Relationships between farmers, researchers and extension workers in participatory research and learning

Source: Mvumi & Mukute, 2006, p. 54

Biggs (in Mvumi & Mukute, 2006, p. 52) defined four kinds of farmer participation in research: contract, where the farmers provide labour and other needed services; consultative, where researchers consult farmers on the diagnosis of their issues and problem; collaborative, where farmers and researchers treat each other as equals in the research process; and collegiate, when researchers support farmer initiated research and experimentation. This research is particularly interested in what they termed collaborative and collegiate farmer participation.

2.5.4.2 Participatory Technology Development

Another important practice that sought to put the farmer first is Participatory Technology Development (PTD) which seeks to achieve food security through:

- Building on local knowledge and skills, which is fundamental for PTD;
- Participation of communities in decision making to increase their technical capacity and technology choice; and
- Strengthening local institutions is essential to achieve participation (Murwira et al., 2000, p. 127).

The advantages of Participatory Technology Development are that it builds trust between farmers and outsiders, taps into farmer potential to innovate, strengthens linkages between indigenous and scientific knowledge, and builds farmer capacity for self-reliance (IIRR, 1998, p. 24) and this can contribute to community resilience which is so necessary under current conditions of risks and uncertainty.

2.5.4.3 Farmer Field Schools

Farmer Field Schools were originally developed by FAO in the 1980s to help rice growing small scale farmers in Asia to learn the skills required for integrated pest management in their paddy fields. The practice was introduced in southern Africa a few years later. After years of working with the Farmer Field School approach, FAO concluded that “it is an effective people-centred learning methodology. It allows farmers to learn about and investigate for themselves, the costs and benefits of alternative crop and livestock management practices for improving farm productivity” (Hughes & Venema, 2005, p. 1). The main characteristics of Farmer Field Schools are that:

- a. Farmers are regarded as experts and they learning by doing, conducting their own studies and experiments;
- b. The field is the primary learning place;
- c. Extension workers are facilitators, not teachers;
- d. Scientists and subject matter specialists work with (instead of lecture to) farmers;
- e. The curriculum is integrated so that it covers agriculture, economics, ecology, sociology and education to form a holistic approach;

- f. Training follows the seasonal cycle;
- g. Learning materials are learner generated; and
- h. There is group and team building which is supported by regular group meetings (Hughes & Venema, 2005, pp. 1-3).

Page (1999, p. 84) identified learning through discovery as the main thrust of Farmer Field Schools, “each FFS requires the presence of skilled facilitator who can promote learning through discovery, based on the premise: If I hear it, I forget, if I see it I remember, if I discover it, I own it for life.” In the Peasant to Peasant (farmer to farmer) Programme of Nicaragua farmers are first taught practical ways of dealing with farming problems before theoretical knowledge is taught, thus bring theory and practice together according to need (Nielsen, 1994, p. 22).

Van Mele (2008) concluded that the introduction of farmer participatory approaches over the past decades has to some extent improved the relevance and subsequent uptake of research results. In today’s risk society, such approaches to learning and development (Farmer Field Systems; Training and Visit Approach; and Farmer First Approach) are bound to encounter problems because they neglect some of the structural, contextual and historical factors. Such kinds of social learning were also likely to reproduce and not transform society (Glasser, 2007; Lotz-Sisitka, 2010). Such approaches to social learning have been called „ego-istic“ by Beck (2009 in Lotz-Sisitka, 2010, p. 83), who elaborated that “Ego-istic responses tend towards favouring situated learning approaches and constructivist learning since they focus on climate change risks and their resolution at a local or contextually significant level (i.e. the individual smallholder farm level...)” Lotz-Sisitka (2010) further argued that such responses result in the narrowing of the possibilities for participation in reflexive justice dialogues and the reduction of the range of choices for thinking about and practising to address new and emerging challenges. This is why a more inclusive, just and reflexive approach to learning and development in agriculture is being sought and developed as discussed in the next section (see Section 2.5.5).

2.5.5 People-centred innovation and learning

Current approaches that enable people centred innovation and learning in the manner described by Scoones et al. (2008) are still emerging. Stoop and Hart (2005, p. 209) noted that a people-centred strategy, which in this case would include the Farmer First Approach, “is more appropriate to cope with diversity issues in both agro-ecological and socio-economic terms; it helps to create an awareness about how agricultural practices are intrinsically intertwined with local culture and customs”. In my view, the main features that seem to distinguish the Farmer First Approach and the people-centred approach are:

- The group and collective approach to learning and innovation, across systems and places;
- The multifunctionality of agriculture is also explicit, covering the three sustainability dimensions of the economic, social and ecological;
- The people-centred approach has an explicit interest in engaging policy and structures that have a bearing on knowledge generation and use and in the multi-voicedness found in the farmers and other citizens; and
- People-centred innovation and learning is concerned with not only household food security and national food security but also food sovereignty, which is concerned with the right to food and the choices to produce food.

The other difference that may be noted in relation to learning and development approaches in education is that the Farmer First Approach appears to have strong features of the second generation activity system while People-Centred Learning and Innovation is more appropriately located in third generation activity system interactions (see Section 3.4.2.3).

But the idea of people-centred innovation was probably what Mwalimu Julius Nyerere was referring to in 1976, when he said:

At the root of the whole problem is our failure to understand and apply to our own activities, the notion of „self-reliance“. We are still thinking that big schemes and orthodox methods will solve our problem. We do not approach people by asking how we can solve it by our own efforts with the resources we have in front of us ... Indeed, local initiatives are often scorned, as not being „modern“ enough ... Whenever any problem is being tackled or any new development is being proposed, our first question must be: what can we in this village or district or region or nation do to solve this problem ourselves. (Julius Nyerere 1976, in Bryant & White, 1984, p. 14)

Similarly, Pimbert (2009) talked about “citizen-led innovation and socio-cultural networks organised more along horizontal and egalitarian lines, working to produce and transform knowledge, sometimes with, but more often without, the involvement of professional scientists” (p. 42). He encouraged farmer and citizen networks to selectively incorporate modern innovations and technologies as part of the process of cultural affirmation and self determination (ibid., p. 47) and focus on the micro-scale understandings, experiences and cultural conceptions of environmental change, underlining community rights, participation and people’s agency. At the same time it should integrate the dynamics of “several actor networks and multiple layers of politics that extend from the local to the international levels” (ibid., p. 14). Agency therefore is a central matter in people-centred learning and innovation. Pimbert advanced the notion of farmer and citizen networks as a mechanism to advance change oriented learning based on work in Asia and South America. Drawing on researchers such as Basset and Charvolin, he characterised farmer and citizen networks as:

Networks for autonomous learning and action value experiential learning knowledge. Intimate knowledge of places where one lives and works matters, so does the tacit knowledge that comes from learning by doing ... Unlike in the experimental sciences, citizens are involved as full and whole human beings, with all their senses engaged in a relation of empathy with living beings, minerals and the wider environment ... Farmers and other citizens involved in this transformative way of learning rarely work alone... People in this way of knowing participate in the joint production of *collective* knowledge [His emphasis]... All members of such networks of knowledge producers and users effectively act as an „extended peer community“ ... The subsequent cross-checking of opinions, joint analysis of information collected, citizen deliberations and peer to peer reviews are all involved in the *in situ* validation of useful knowledge. The possibility of „extended peer review“ is a formidable asset at a time when citizens and their communities are faced with the open ended uncertainties of a fast moving and changing world (environmental and climate change, spread of new diseases, unstable markets and political change). (Pimbert, 2009, pp. 47-49)

The notion of extended peer reviews (and communities) resonates with the idea of using distributed cognition to develop more robust analyses and solutions, a concept which is central to expansive learning in CHAT when more than one activity system „cross boundaries“ and develop a „shared object“ towards which they collectively work. Pimbert (2009) drew on Visvanathan to argue that participation should not be merely used to make research more effective or more efficient but should have a deeper intent and scope. Such deep participation should encourage greater cognitive justice which “emphasises the right for different forms of knowledge and their associated practices, livelihoods and ways of being, to coexist” (Pimbert, 2009, p. 38). In describing cognitive justice, Visvanathan (2005, in Pimbert, 2009) noted:

The opposition of expert and lay knowledge disguises to a certain extent the opposition between science and alternative sciences. One needs instead a parliament of epistemic debates, but also the ecologies that would let these forms of knowledge survive and thrive not in a preservationist sense but as active practices. (p. 38)

The above quote resonates with Nyerere’s point about the perceptions of local initiatives (as alternative sciences) and how they should also be allowed to survive, thrive and grow. The recommendation for epistemic debates also resonate with Wals’ notion of social learning that is conscious of its framings and works on them (see Section 2.6). The concept of ecologies of knowledge encourages one to be mindful of the circumstance into which knowledge generated is nurtured. These conceptualisations are also underlined by Kagawa and Selby (2010), whose discussion of climate change education is relevant to farmers in southern Africa whose learning processes form an important focus in the study:

Climate change education needs to happen within interdisciplinary and multidisciplinary frames ... Interdisciplinary approaches will also enable a reclaiming of non-scientific indigenous knowledge... The response to climate change needs to be both local and global... Wherever it takes place, climate change education needs to be a social and holistic learning

process; climate change is too urgent and important to suffer „death by formal curriculum“. Looming rampant climate change calls for flexible learning and emergent curriculum approaches that embed climate change learning and action within community contexts ... There is need for the complementary and recursive use of artistic, embodied, experiential, symbolic, spiritual, and relational learning, especially in the vital task of reconnecting learners to the earth. (pp. 241-242)

Since people-centred learning and innovation is recent, there are not many approaches to draw on at either the regional or global level. Perhaps the two important examples are Promotion of Local Innovation (PROLINNOVA) and Participatory Guarantee Systems which are discussed below.

2.5.5.1 Promotion of Local Innovation (PROLINNOVA)

Promotion of Local Innovation is an approach:

which was conceived in late 1999, when Southern and Northern NGOs – supported by GFAR, the NGO Committee (NGOC) of the Consultative Group of International Agricultural Research (CGIAR) and the French Ministry of Foreign Affairs met ... to see how participatory approaches to ARD [Agricultural Research and Development] based on local initiatives could be scaled up. (PROLINNOVA, 2009, p. 1)

PELUM is one of the Southern NGOs that has been taking part in PROLINNOVA, and the two southern African countries where this approach is being promoted are South Africa and Tanzania. PROLINNOVA seeks to promote local innovation in ecologically oriented agriculture and natural resources management through:

- Demonstrating the effectiveness of farmer-led participatory innovation for sustainable development;
- Building farmer-extension-researcher partnerships;
- Enhancing capacities of farmers, researchers and extension workers in participatory development;
- Engaging in national and regional policy dialogue to stimulate and enhance local innovation;
- Setting up platforms for reflection, analysis and learning about local innovation; and
- Integrating participatory approaches to farmer led innovation and experimentation into research, education and extension institutions (PROLINNOVA, 2009, p. 1).

One of the specific areas of PROLINNOVA's interest has been adaptation of farming communities to climate change. Wongtschowski, Verburg and Waters-Bayer (2009) explained that adaptation can be specific action such as switching from one crop to another but it could also be systemic, such as diversifying livelihoods, or institutional to hedge against climate variability and extremes (p. 5). They further argued that it could also be concerned with institutional reform such as altering land tenure to encourage better land and

natural resources management. “Adaptation is also a process. The process of adaptation includes learning about risks, evaluating response options, creating the conditions that enable adaptation, mobilising resources, implementing adaptations and revision choices with new learning” (Wongtschowski et al., 2009, p. 5). They concluded that adaptation to climate change required a multi-stakeholder approach, building on the strength of each stakeholder group. The adaptation process being proposed is very much similar to expansive learning, which this study worked with and which is discussed in Chapter 4.

2.5.5.2 Participatory Guarantee Systems

Participatory Guarantee Systems or PGS are small scale organic farmer-driven systems for marketing and branding produce in a transparent, credible cost-effective manner that ensures the integrity of the product to the organic consumer. It was developed in the framework of the International Federation of Organic Agriculture Movements (IFOAM) (IFOAM website). PGS arose in response to the heavy costs associated with organic certification that were excluding the small scale organic farmer whom it sought to serve. The associated challenge is that legislation on organic production protects the term “organic” for the sole use of formally certified produce and operations. Both the cost of certification and the legislation passed on what constituted organic operations had the unintended consequence of limiting the benefits of organic agriculture to a socio-economic sector most in need of support – thus undermining the social sustainability goal of organic farming (IFOAM homepage). This is how the concept of Participatory Guarantee Systems emerged – out of contradictions between what organic agriculture movements sought to achieve and what they were achieving; between the means of achieving a quality and certified product and the means available to the small scale organic producers. Participatory Guarantee Systems provide a „Third Space“ by offering a credible assurance system that is culturally relevant and easily accessible to small growers in different parts of the world operating under different agro-ecological and socio-economic conditions (IFOAM homepage). One of the key characteristics of any Participatory Guarantee System is a facility for self-evaluation of the farmer, peer review by fellow farmers, and stakeholder review by groups such as consumers and buyers who must have access to the farm and assess the extent to which locally set standards are being met. It thus empowers local stakeholders to drive the organic farming practices in their local area informed by their understanding and it also results in the reduction of costs to both the producer and the consumer.

In southern Africa, the Participatory Organic Growers Network of Southern Africa, a recent initiative which intends to assist 50 grower groups to operate in the next four years, illustrates how Participatory Guarantee Systems are being worked with regionally (Hauptfleisch, 2009). At a country level, in Zimbabwe the Zimbabwe Organic Producers and Promoters Association and Fambidzanai Permaculture Centre, together with Garden Africa of the United Kingdom, have begun a similar initiative targeted at working with over 600 farming

households and 2,000 hectares in a two-year pilot programme (GardenAfrica, 2009). In South Africa, the Bryanston Organic & Natural Market in Johannesburg and Umthombongashi Co-op in KwaZulu-Natal already operate under a Participatory Guarantee System while Earth Mother Organics in KwaZulu-Natal works with the concept without using the label (Hauptfleisch, 2009).

2.5.5.3 Implications of people-centred learning for research in agricultural learning

FAO (2006) also pointed out that education is critical for the realisation of the right to food and that sustainable agriculture should be incorporated in school curricula at all levels. Under Guideline 11 on Education and Awareness raising, Guideline 11.3 claims that “States should encourage agricultural and environmental education at the primary and secondary levels in order to create a better awareness in new generations about the importance of conserving and making sustainable use of natural resources” (FAO, 2005, p. 23). Both statements point to the need for a profound engagement with the learning and practice of sustainable agriculture, which is the focus of the change oriented learning in this study.

In planning for that learning, it is imperative to draw on different sources of knowledge as Van Mele (2008, p. 184) noted, based on Thompson and Scoones, “As with scientific knowledge, folk knowledge is diffuse, fragmentary and partial”. In a related argument, Pimbert (2009, p. 22) concluded that more democratic ways of knowing are required “to bring together partial and incomplete perspectives of different actors faced with uncertainty, diversity and dynamic change”. In a related discussion one of the main conclusions reached by Stoop and Hart (2005, pp. 211-212) was that the close collaboration that is required between farmers and researchers calls for fundamental changes in the way agricultural specialists are trained, the organisation of agricultural research as well as in institutional arrangements. They suggested a holistic approach to research and development so as to cope with diversity, institutional arrangements that permit partnerships between stakeholders operating at different levels, and professional staff with interdisciplinary skills and sound technical expertise. They recommended the teaching of socio-psychological elements in agricultural sciences. In the same vein, Pimbert (2009, p. 10) pointed out that a holistic approach in agriculture should radically transform knowledge by intentionally linking together ecological, economic, socio-political and cultural realism that have been historically kept separate by mainstream science and policy. He further pointed out that this would imply deep changes in academic cultures, self-image of researchers and academics, in pedagogies, research agendas and methodologies throughout the world (Pimbert, 2009, p. 24). This study made an attempt to work with this approach to knowledge and its generation.

Drawing on authors such as Pretty, Chambers and Feyerabend, Pimbert (2009, p. 36) drew out several guiding principles for change oriented learning (which are of particular interest to this study). These include the following requirements

- A defined methodology and systemic learning process, which focuses on the cumulative learning by all participants;
- Multiple perspectives, deliberately sought to obtain diversity as there are multiple ways of describing any „real-world activity“;
- Group learning processes to enable the handling of complexity;
- Context-specific learning that is therefore flexible enough to be adapted to each set of new conditions and actors;
- Transformation of existing activities to bring about changes which the people concerned see as improvements and where the role of the expert is to help people in their own situations carry out their own studies and make relevant achievements ;
- Sustained action in the face of dynamic change, “including confronting others” constructions, and this debate changes the perceptions of the actors and *their readiness to contemplate action*” [My emphasis, because this links to agentic talk, which became an interesting area of research in the study]. The implementable changes that are agreed upon often represent an accommodation between different conflicting views.

In their discussion on social partnerships, Fennessy, Billett and Ovens (2006) noted the opportunity for relational learning spaces (and therefore relational agency) that these partnerships provide, which include:

- Developing self-knowledge, self-awareness and self management;
- Nurturing democratic values: trust, respect for others, civic and personal ethics, empathy and tolerance;
- Improving interpersonal and social skills: listening, experimenting, problem solving and negotiating;
- Understanding personal and local needs in the context of the broader systems and process;
- Adapting and using social and political procedures and processes for local benefits; and
- Developing resilience: the capacity to remain committed and to adapt to changing circumstances.

They concluded this nature of partnerships in learning has “potential to enlarge capacity for action and responsibility, which underpins citizenship as a learning process” (ibid.). The process of engaging in social partnerships in learning therefore appears to build individual,

relational and collective agency. As Fennessy et al. (2006) noted such social learning processes are not merely about how to do with others but also about how to be with others. In this study, there was need for methodology that would enable systemic and cumulative learning, bring multiple perspectives and knowledge together, enable group learning and the handling of sustainability, consider the context of real activities and at the same time prepare research participants to act. This methodology is proposed in CHAT and is called Developmental Work Research (see Section 4.2.1) and is made operational through an expansive learning cycle.

2.6 LINKING AGRICULTURAL RESEARCH AND EXTENSION TO SOCIAL LEARNING

Wals et al. (2009, p. 9) pointed out that social learning was, among other things, inspired by the transition from industrial society to the present day risk society which is characterised by globalisation and individualism, insecurity, uncertainty and unpredictability – where past solutions are no longer enough: “Social learning is often referred to as a way of organising individuals, organisations, communities and networks, that is particularly fruitful in creating a more reflexive, resilient, flexible, adaptive, and indeed, ultimately, more sustainable world” (Wals, 2007, p. 37). Wals associated social learning with education for sustainability. The learning of sustainable agriculture is one form of education for sustainability. Similarly Fennessy et al. (2006) pointed out that social partnerships constitute new learning spaces. Wals (2007) argued that the basic aim of education for sustainability is to help support individuals and communities to understand the complex nature of natural and built environments resulting from the interaction of their biological, physical, social, economic and cultural aspects and to obtain the necessary skills, knowledge and attitudes to anticipate and solve the problems responsibly (pp. 35-36). Another aim of education for sustainable development is to show the interdependence between the economic, ecological and social (Wals, 2007). This aim alone underlines the dialectical nature of the purpose of education for sustainability, which has also been identified in sustainable agriculture learning and practice by Pretty (2002) and Pimbert (2009). Wals (2007) further argued that the other role of education for sustainability is to build a sense of responsibility and solidarity and this resonates with the *zenzele* concept (Dube, 2002), as well as farmer and citizen participation peer reviewed networks located in the field of sustainable agriculture and food sovereignty (Pimbert, 2009). It also resonates with the concept of partnerships discussed in the Promotion of Local Innovation (PROLINNOVA, 2009). Scott (in Pimbert, 2009) called the kind of learning that comes from social learning *mêtis*, meaning:

Mêtis, with the premium it places on practical knowledge, experience and stochastic reasoning, is of course not merely the now superseded precursor of scientific knowledge. Its mode of reasoning is most appropriate to complex material and social tasks where uncertainties are so daunting that we must trust our (experienced) intuition and feel our way. (Pimbert, 2009, p. 56)

This approach to social learning is further supported by Bradbury and Reason (2001, in Pimbert, 2009) who argued that social learning for food sovereignty should enable farmers and other citizens “to shift the dialogue about validity from a concern with the idealist questions of search for truth, to a concern for engagement, dialogue, pragmatic outcomes and an emergent, reflexive sense of what is important” (p. 56). Similarly Wals argued that sustainability education “should bring about a closer link between sustainability problems that are faced by particular communities and focussing analysis of these by means of interdisciplinary, comprehensive approaches which will permit proper understanding of sustainability problems,” (Wals, 2007, p. 36). This study set out to seek sustainability issues being faced by particular communities in Lesotho, South Africa and Zimbabwe, and worked with different stakeholder groups in each case to understand the problems better and to jointly develop model solutions to some of them (see Chapters 7 and 8).

Drawing on the work of Capra, Wals (2007, p. 37) suggested that the creation of a sustainable world requires systems thinking, which refers to things like “seeing connections and interrelationships, fine-tuning functions and roles, utilising diversity, creating synergies”. The concept of activity systems, which the study worked with, provided a mechanism that enabled such systems thinking (see Section 3.4.1).

Social learning tends to take place when divergent interests, norms, values and ways of seeing reality meet in an environment that is ideal for meaningful collective learning and in social learning, what to learn is at least partly determined by the community of learners itself (Wals, 2007). This approach in social learning suggests that contradictions are potential sources of learning, which resonates with critical realism’s position that these are fertile ground for learning (see Section 3.2) and with Engeström (2005) on contradictions as potential sources of learning in the context of CHAT (see Section 3.6.4).

Wals (2007, pp. 39-41) proposed that the goals of social learning include addressing such questions as:

- How do people learn?
- How will the people recognise that they have learnt and transcended their social norms, group thinking and personal biases?
- What knowledge, skills and competencies are needed to cope with new natural, social, political and economic conditions?
- How can learning build on what exists among participants?
- How can dissonances created by different values, views and ways of looking at the world and of trying to understand it, stimulate learning, creativity and change?

- Is the nature of change oriented learning desired emancipatory or instrumental?

Bawden, Guijt and Woodhill (2007) preferred to call bigger social learning processes, „societal learning“ to show the shift from group based learning to “the capacity of societies and communities to be more learning oriented in the way they tackle important issues related to a more sustainable world” (p. 134). This makes sense when many networked activity systems intentionally interact to cause change and can resonate with some extended peer communities and larger processes of people-centred learning and innovation. However, in this study I will work with the concept of social learning partly because it is more widely used and also because the focus of the research was much more localised. Meanwhile Wals et al. (2009, p. 13) underlined the importance of linking the macro and the micro processes in social learning. They argued that this can be achieved through the following steps:

- Contemplating whether social learning is the way to go.
- Orientating: exploring issues at stake, assessing the playing field, determining instrument mix, establishing core organisation.
- Activating: selecting key actors, expanding core organisation, exploration of available relevant perceptions and imaginable futures, and utilising dissonance.
- Selecting: exploring possible solutions, creating shared vision, choosing options, and developing action plans.
- Implementing: ensuring that the selected plan is executed.
- Evaluating: the adequacy of the solution, and that of the process used.

This conceptualisation of steps in social learning follows essentially the same steps as expansive learning (see Section 3.6.5) and makes provision for „miniature cycles“ (see Section 4.4) of learning at each stage, which is consistent with micro processes of learning as discussed later in this study (see Sections 8.2-8.4). Wals et al. (2009) further underscored the importance of communicating with stakeholders not represented in the core group as well as with peripheral actors and this resonates with the critical realist notion of presenting the absent (see Sections 8.2.4 to 8.2.6) and with the emphasis on boundary crossing in third generation CHAT (see Sections 3.4.2.3 and 3.6.4).

Pimbert (2009) also recommended a shift from focusing “less on what we learn, and more on how we learn and with whom” (p. 27). He recommended that a good deliberative process in a social learning situation should include diverse actors “in deliberative processes and safe spaces ... a set of carefully designed safeguards to ensure quality and validity of knowledge and actions generated” (p. 32). The implications of these recommendations for this study was to work with a methodology which would enable different actors to speak out freely and to have a rigorous methodology for arriving at potential solutions to issues being experienced by

research participants (see Change Laboratory Workshops and Expansive Learning in Section 3.6.5).

Wals (2007) concluded that because social learning builds on the fertility of conflict and dissonance, it is important to pitch learning just outside people's comfort zones; if it is either too comfortable or too far outside the comfort zone, no meaningful learning happens. This is very much similar to the notion of zone of proximal development discussed later in Chapter 3 (see Section 3.6.1)

2.7 CONCLUSION

This chapter has examined the notion of risk and how it plays out at global levels as well as in the field of agriculture in southern Africa. What appears necessary to deal with risk is what Ravetz and Funtowicz (in Pimbert, 2009) called post-normal science, which is “the sort of inquiry in which the facts are uncertain, values are often in dispute, stakes are high and decisions are urgent” (p. 51). These insights are also discussed by Wals (2007) in his conceptualisation of social learning. The chapter also discussed some of the risks and uncertainties being faced in (southern) Africa and proposed that these require ways of knowing and doing that draw on different knowledge systems, which means dealing with dialectical matters. The dynamic nature of challenges and risks and the need therefore to be reflexive in dealing with them was also discussed. The chapter has further highlighted some of the structural constraints that are faced by those intending to learn in potentially transforming ways and those who want to practise sustainable agriculture, which suggests the need for agency and the formation of farmer and citizen networks.

The chapter also discussed the evolution of agricultural research and extension, underlining the need for valuing different perspectives and ways of doing agriculture. The Ndebele concept of *zenzele*, which foregrounds interdependence and reciprocity, not isolation, dependence or individualism in rural development, exemplified how some of the local cultural traditions are potentially usefully in people-centred development. This resonates with the African philosophy of *ubuntu* – „I am because you are“ – which underpins the African Renaissance and the philosophy of relationalism (see Section 3.3). The Ndebele concept of *qogelela* „little by little, one day at a time“, suggests an awareness of the notion of individuals' zones of comfort discussed by Wals (2007) and the zone of proximal development discussed in the next chapter (see Section 3.6.1). The idea of making progress gradually was also captured by Wals et al. (2009, p. 5) who concluded that in social learning processes, “there are ideas regarding which direction the participants want to go and there are even recurring patterns, but the ultimate success comes about little by little”. This resonates with Archer and Bhaskar's theory of morphogenetic social change (see Section 3.2).

The notion of extended peer review communities is consistent with the idea of enhancing reflexivity in a risk society. The evolving conceptualisations of what constitutes agricultural extension and farmer learning seem to have implications on what may constitute the farmer's workplace. Whereas in the technology transfer phase, this place would largely have been the field, garden or pasture, in the farmer first approaches, the site appears to have expanded to include the nearby communities and landscapes. But the people-centred learning and innovation approach seems to extend the horizon of the workplace to faraway places such as the offices of policy makers, the market place and symposia. These conclusions suggest the need for a theoretical framing that embodies dialectics, reflexivity, structure and agency.

The next chapter (Chapter 3) discusses the main theories that were used in the research consistent with the research questions and the issues and opportunities arising from the contextual analysis as presented in this chapter.

CHAPTER 3: Theoretical Framework

3.1 INTRODUCTION

This chapter discusses the ontological and epistemological theories which I drew on in the study. It links to Chapter 1 in the sense that the theoretical framing discussed in this chapter enabled me to address the research questions outlined in the first chapter (See Section 1.5), to explore and expand farmer learning processes in sustainable agriculture workplace contexts. The theoretical framing is also aligned to the sensitising concepts discussed in Chapter 1, which are further discussed in Chapter 2 – dialectics, reflexivity and agency. This chapter is also linked to Chapter 2 in that the theories discussed here are concerned with enabling the answering of agricultural learning and development issues and opportunities in the previous chapter, which include how to:

- Learn and practise agriculture when there are many risks and uncertainties, which calls for the development of new solutions following a better understanding of issues in terms of their history, depth and scope, beyond what appears on the surface;
- Work with vested interests in agriculture which create contradictions and may require agency on the part of farmers;
- Work with a diversity of knowledge sources and systems, cultures and contexts, which calls for dialectical engagements and reflexivity, underlining at the same time how different things may be related;
- Build on historical and evolving developments and their implications and application in contemporary and future learning and practice;
- Work with new and emerging problems in a change oriented learning process, which requires reflexivity and agency;
- Work with contradictions that are inherently found in the triple object of sustainable agriculture, that is, economic, ecological and social sustainability which demands utilising dialectics, reflexivity and agency; and
- Work on structural constraints and with enablements, which calls for a good understanding of causal mechanisms in both individual persons and in the societies in which they are found.

This chapter focuses on discussing the theories which were employed in the study which have a learning and transformative interest with potential to enhance the agency and capabilities of the research participants, who in this case were, primarily small scale farmers involved in sustainable agriculture. Two related ontological theories which I drew on are relationalism and critical realism to permit the study to allow for enquiries into questions of relatedness and causal mechanisms. I drew on the epistemological theory of Cultural Historical Activity

Theory (CHAT) and Theory of Practice to enable me to illuminate current learning processes and expand them with research participants. In this chapter, I explain reasons for drawing on each theory, its main features and how I worked with these theoretical concepts and why.

3.2 CRITICAL REALISM

Critical realism based in the work of Bhaskar (1998), Sayer (2000) and Benton & Craib (2001), provides an ontological framing that permits one to delve beyond the current and the surface into the history and the underlying to find „real reality“ that lies beneath the empirical and the actual. This philosophical base underpins the epistemological framework that I used. One thing that connects CHAT to critical realism is emancipatory politics, in particular those associated with Marxism and neo-Marxism as can be inferred from this statement, “Critical realism was developed during the 1970s at a time when Marxism was strongly represented among social scientists. Marxism was one of the few approaches to social science whose explicit philosophical commitments coincided with the main outlines of critical realism” (Benton & Craib, 2001, p. 136). The roots of CHAT also lie in Marxism and this makes the theories potentially compatible. The original developers of CHAT (Vygotsky, Luria and Leont’ev) set out to develop Marxist psychology from about 1927, ten years after the revolutionary successes of 1917 (Edwards, 2005a).

Chapters 1 and 2 indicated the need to embrace competing interests and needs while also allowing learning processes to transform current problematic issues and relationships. Dialectics, agency and reflexivity underpin this research work as mentioned in Chapter 1. Critical realism as an ontological theory does the following (Benton & Craib, 2001, p.120-121):

- a. Parker (2001) commented on the dialectical foundation of critical realism when she draws on Bhaskar’s **‘fertility of contradiction’** and pointed out that inconsistency in knowledge can be resolved by seeking the grounds of the two until they can be re-described in a non-contradictory way. This can help address the nature of both science and lay knowledge as partial and fallible (see Sections 2.3 and 2.5.5.2) as discussed in Chapter 2. For example, Pesanayi (2008, p. 118) argued that instead of ignoring “value-laden ambivalent messages conveyed by stakeholders [in agriculture] to communities of practice tend to confuse their domain, and expose disharmony among the stakeholders” and he recommended the need for the stakeholders to be alert to and address such ambivalence. In the context of critical realism such ambivalence can be fertile ground for generating new knowledge and solutions in sustainable agriculture;
- b. Critical realism is emancipatory in that it is committed to **changing** unsatisfactory and oppressive realities (see Section 2.5.5.3). Dean (2006) underscored the need of this kind of freedom as being freedom with other humans not from others. Changing

- unsatisfactory conditions could mean addressing extension and infrastructure needs of farming communities in southern Africa (see section 2.3);
- c. Critical realism is based on **reflexivity** which recognises the possibility of thought, or that language can represent something outside itself. In the study this means creating opportunities for research participants to think, reflect and plan together, using language to engage and model solutions to risks and uncertainties that have become commonplace (see Sections 2.5.4 and 2.5.5). Pesanayi (2008, p. 120) underlined the need to develop capacities in farming communities of practice to “build on a wide range of learning interactions and learning processes”;
 - d. Critical realism assumes that the surface appearance of experience (empirical) is potentially misleading and insists on **getting beyond** or behind surface appearances. Chapter 2 noted that some of the things that appear to be solutions in agriculture, such as Genetically Modified Organisms to increase food production are actually problematic for smallholder farmers because they are unable to save and share the seed but must depend on the agro-companies, who may end up controlling the agricultural production chain (see Section 2.3); and
 - e. Critical realism asserts that our knowledge of the natural and social world is both **fallible and provisional** because our experience of the world is always theory laden and should always be open to correction in the light of further work such as dialogue, experiments, interpretations and observation. This explains why in Chapter 2, the people-centred learning and innovation approaches bring together different knowledge creators and users and argue for being aware of the political ecology of knowledge (see Section 2.5.5).

The above aspects of critical realism were also useful in addressing the research questions. For example, the fertility of contradictions described by Parker, and the focus on reflexivity that draws on thought and language as discussed above enabled me to view and work with tensions and contradictions in a constructive manner to address two research questions in the study:

- What are the current limitations and contradictions of sustainable agriculture learning processes among farmers?
- How can sustainability be better learnt and more reflexively practised in the farmer’s workplace?

Price (2008) identified the critical features of critical realism as: being an under-labouring science; aimed at human well-being and emancipation; seeking theory-practice congruence; and based on immanent critique of what it examines by looking for internal inconsistencies, which we can describe as contradictions. The study therefore used critical realism to under-labour epistemological theories. It also used critical realism’s concept of emancipation to

support the development of responsible agency among research participants; while at the same time seeking out internal inconsistencies in sustainable agricultural practices that were under review and at what may have caused them at historical and structural levels. Going beyond the surface also enabled me to draw out contradictions from problems in order to assist research participants to develop model solutions to address some of their limitations. Lather (1991, in Babikwa, 2003) argued that emancipatory research should go beyond the concern for more and better data to a concern for research as praxis, which aims to enable participants, not only understand, but also change their situations. Pesanayi (2008) went further to argue that such changes should enhance the adaptation capabilities of farmers to cope with risk. Critical realism's commitment to changing unsatisfactory conditions helped me to address another research question in the study, which is:

- What conceptual artefacts can the study develop to support expansive learning for sustainability in farmers' workplaces?

Critical realism, while encouraging the valuing of different knowledge systems, does not go as far as claiming that anything goes. Parker (2001) cautioned "Overall, critical realists will need to become more reflexively critical of the grounds for pluralist toleration of marginalised knowledges, in particular, exploring the grounds for enabling their development and protecting them from potential destruction by hegemonic powers" (Parker, 2001, p. 258). One of the three sustainable agriculture case studies is the Machobane Farming System, which was largely based on the local Basotho culture, one of the marginalised knowledges. By examining the practice with research participants, the study seeks to help develop and scale out the practice in a manner that gets protected from potential destruction.

Bridges and Smith (2007, p. 2) encouraged the use of a philosophical framework to underpin or „underlabour“ research in social sciences. Similarly, Archer (1995 in Leesa, 2007) explains that ontology „acts as both gatekeeper and bouncer of methodology“ because how society is held to be affects how it is studied. Critical realism builds on the ideas of reflexivity and dialectics, which are central in the pursuit of understanding learning and practice in this study (see Sections 1.6.1 and 1.6.2). Critical realism enables the development of an explanatory critique, with ontological depth, that goes beyond the actual and the observed to the causal mechanisms that are invisible, thus avoiding the fallacy of actualism (Lotz-Sisitka, Motsa, Mukute & Olvitt, 2008). Bhaskar cautions against „epistemic fallacy“, which happens when empirical reality is conflated – when what is experienced or observed is seen as the whole reality (Parker, 2001). For example, in agriculture a cabbage that looks big and spotless may appear as healthy but in fact, it could have been sprayed with carcinogenic pesticides that harm the consumer as well as the ecology of the garden in which the cabbage was grown. The point about surface appearances being potentially misleading was also highlighted by Babikwa (2003) when he discussed causal mechanisms influencing why farmers did not farm

sustainably on rented land. The reasons for this behaviour had nothing to do with the skills to farm sustainably but were political:

Some of the conditions set by landowners bred a sense of insecurity for the landless and became a disincentive to sound land management and in turn a strong factor behind environmental degradation. Farmers knowingly violated sustainable agricultural principles through such actions like over-cultivation of land and intercropping of incompatible crops just because they had insufficient land. (Babikwa, 2003, p. 202)

Critical realism provided further depth to the empirical and historical analysis that I was able to develop using the CHAT framework. Critical realist lenses in the study enabled the development of ontological depth and identification of causal mechanisms – beyond surface appearances.

Bhaskar noted that reality is stratified with the empirical, the actual and the real respectively (Sayer, 2000, p. 2; Benton & Craib, 2001, p. 125). Empirical reality is that which can be observed; actual reality is the second layer of reality and is what happens when events are activated. The real is whatever exists, whether people know it, and can be social or natural. It is associated with causal powers and structures. This layered reality can further be divided into two groups, the transitive, which can be changed, and the intransitive, which is nearly impossible to change. The „real“ is intransitive and is associated with the notions of power, mechanisms and tendencies (Benton & Craib, 2001, p. 124) discussed above. Bhaskar also called these tendencies „generative mechanisms“ and they exist independently of the events and experiences to which they give rise. They are contingent and emergent, not fixed or universally deterministic. To illustrate that power is a reality even though we cannot see it, Sayer (2000, p. 2) said, „... individuals, in virtue of their physical make up, socialisation and education, are able to work; indeed, they have the power even when they are currently unemployed and idle“. The actual refers to what happens if and when the powers are activated. For example, labour power may be activated, resulting in someone working. The empirical is in the experience domain and is observable, and in this example may reflect the person’s experience of working.

Besides providing for depth analysis of ontology, critical realism also theorises agency, which is also central in this study (see Section 1.6.3). Bhaskar (1994) defined agency as the ability to respond to developments outside one’s immediate sphere of influence and produce intended consequences. Human agency involves elaboration (ibid., p. 97). When individuals act on the world they exercise human agency (intentionally and otherwise). This results in transformation or reproduction of social structures. Social structures on the other hand either enable or constrain human agency. Bhaskar presented his ideas on the structure-agency relation in a model which he called Transformational Model of Societal Activity (Bhaskar,

1994, p. 92). This aspect provides a tool for understanding why people may not be incorporating sustainability in their workplaces, especially when they want to. I have also drawn on Bourdieu's theory of practice to extend explanations of concepts of structure and agency, which will be discussed later in this chapter (see Section 3.5).

Dean (2006, p. 129) pointed out that speech has causal powers and this study uses agentic talk analysis in Chapter 8 to see how speech in Change Laboratory (CL) workshops may have caused or prepared people to act. Another form of causal power she identified was culture such as capitalism or use of particular technologies.

3.3 RELATIONALISM

Emirbayer (1997, p. 282) argued that "The key question confronting sociologists in the present day is not „the material versus the ideal“, „structure versus agency“, „individual versus society“ or any other dualisms so often noted; rather, it is the choice between substantialism and relationalism". This therefore resonates with Bhaskar's notion of emergence – which is concerned with how new things happen from things that are completely different from them. Sayer (2000) described emergence as taking place when two or more phenomena interact and give rise to a new phenomenon that cannot be reduced to either of the originals. Carter and Sealey (2000, in Quinn, 2007, p. 13) described emergence as "the generation of properties and powers which will not be reducible to their constituent elements and must therefore be regarded as distinct from them". Substantialism is concerned with looking at the world as made of separate and distinct parts that are closed, self-sufficient, given, fixed, durable and capable of self-action and some degree of interaction which does not change them; while relationalism, on the other hand, is concerned with seeing the world as made of parts that are connected, related to one another, open and dynamic and capable of influencing each other in ways that result in transactions. The relational approach enables the analysis of the object of study in a way that acknowledges the object as moving and dynamic, as located in particular social, ecological and economic contexts which it influences and is influenced by (see Chapter 2). Such relations are what create and enable dialectics, reflexivity and agency which are the central conceptual tools in this study (see Sections 1.6.1 to 1.6.3). In addition, the main theoretical framework draws heavily on Marxist dialectical thinking which Emirbayer recognised as fundamentally relationalist:

Marx, for instance ... was profoundly a relational thinker; this is clear from his early analyses of alienation (Ollman, 1971), his discussion of commodity fetishism, his keen insights into the internal relations among production, distribution, exchange, and consumption and indeed, his understanding of capital/wage-labour relation itself. (Emirbayer, 1997, p. 290)

Critical realists such as Elias in Ritzer and Smart (2001) also pointed out that the world is made up of relationships and functions. The philosophy of relationalism also resonates with

Bourdieu's work on structure and agency since he talked of power as being exercised in relation to other people: relations of force that obtain between the social positions" (Bourdieu & Wacquant, 1992 in Emirbayer, 1997). In looking for a social theory that was congruent with the research questions, learning and development issues as well as with the ontological theory, CHAT appears to offer most of what I sought: dialectics, which is found in the notion of contradictions; reflexivity, which runs through the expansive learning cycle; and agency which is embedded in the idea of transforming activity systems and enabling participants to externalise their learning by working more effectively on their object (Engeström, 2008; Daniels, 2008). The notion of an activity system and especially one that interacts with others underpins the relational approach in CHAT.

3.4 CULTURAL HISTORICAL ACTIVITY THEORY

The epistemological theory that forms the backbone of this thesis is Cultural Historical Activity Theory (CHAT), especially the second and third generation CHAT (Engeström, 1999a & 1999b). This theory of learning and development (Vygotsky, 1978) is built on contradictions which are a form of dialectics as well as on reflexivity and agency (Engeström, 1987, 2008), and offers an explanation of learning through activity that helps to develop understandings of workplace learning (Sawchuk, 2009), which is the thrust of the study. Engeström developed CHAT based on the work of Vygotsky and his Russian colleagues Leont'ev and Luria (Daniels, 2001; Edwards, 2005a; Warmington et al., 2005, Roth & Lee, 2007). CHAT was informed by the classic German philosophies of Kant and Hegel, Marx and Engels (Engeström & Miettinen, 1999; Quek & Alderson, 2002). From Del Rio and Alvarez (2007), the following observations about Vygotsky's role in CHAT's development can be drawn:

- Vygotsky was influenced by evolutionary biologist Jennings and ecologically oriented Gestalt authors such as Lewin and Koffka;
- Vygotsky drew on Von Uexkull's work to build the idea of an activity system – also referred to as the human functional system. Von Uexkull defined the relations between the animal organism and its medium as ecological and dynamic, as a dialectic process;
- Vygotsky drew on Marxist materialism which was concerned with the use of tools to mediate the transformation of nature; and
- Vygotsky's major contribution to eco-functionalism was to introduce the genetic cultural perspective according to which the activity system is at once interfered with and enlarged.

In CHAT knowledge is viewed as contextual and transformative. It is generated through processes of reflexive investigation and learning. CHAT posits that learning takes place through collective activities that are purposefully conducted towards a common object.

Edwards (2005b, p. 50) defined learning as: “concerned with within-person changes, which modify the way in which we interpret and may act on our world ... and in turn change it by our actions”. The learning is facilitated by the use of conceptual and material tools which help the learners to understand the object better. The incorporation of new knowledge and concepts into the individual happens first at the interface of the community and the individual through internalisation – inter-mental, and secondly within the individual, intra-mental. Discussing CHAT, Edwards (2007) made it clear that individuals and their society interact dialectically when she says “the way we see, think and act in our worlds are shaped by the cultures in which we are formed and in turn we shape those cultures by our actions” (Edwards, 2007, p. 259). Dean (2006, p. 132) noted that culture “is composed of a patterned relatively stable set of social relations, practices and processes which are capable of reproducing a built habitat in which newborns can learn how to behave in ways which will ensure reproduction of both themselves and the culture in which they are vitally dependent”. The individual externalises acquired knowledge through applying it to the object towards an intended outcome. Billett (1994) pointed out that the Vygotskian school uses the concept of knowledge appropriation in learning to refer to what happens when inter-psychological processes happen and before the knowledge becomes an intra-personal attribute, because the knowledge is not absorbed unaltered. “Appropriation refers to a personally active – and at the same time – multi-dimensional process; it indicates that new knowledge and competence are actively transformed rather than simply internalised by the learner” (Simovska, 2008, p. 64). Discussing three forms of learning in groups – which entail internalisation, appropriation and externalisation – within the broader framework of social learning process, Glasser (2007) noted:

Hierarchical and non-hierarchical active social learning are widely used and applied with great benefit to expand the penetration of existing knowledge. Co-learning, because of its requirements for team building, complete engagement, „learning by doing“ ... and accountability, in addition to supporting the penetration of existing knowledge, supports the generation of new knowledge and novel strategies for addressing real-world problems. Co-learning supports change, positive change in particular by building capacity in three fundamental areas: critical evaluation of existing knowledge and problems, knowledge generation and penetration, *and* application of this new knowledge to policy, practice and everyday life [emphasis in original]. (p. 51)

Glasser’s argument above resonates with that of people-centred innovation and development (see Section 2.5.5) and well as with the notion of expansive learning found within CHAT (see Section 3.6.5). It also underlines the change oriented nature of co-learning in social learning, which is central to this study.

3.4.1 CHAT and activity systems

Sawchuk (2003) explained an activity system as the minimal meaningful context for understanding individual action. An activity system consists of a group, of any size, pursuing,

a specific goal in a purposeful way (Peal & Wilson, 2001). Billet (1994) pointed out that social practice utilises activities to construct knowledge and that activities are developed socio-historically through a community of practice. The elements of an activity system in CHAT are explained in Section 3.4.2, Figure 3.1).

Table 3.1: Elements of an activity system

Element of activity	Explanation of the element
Subject	Individual or group of people whose agency is chosen as a point of view in the analysis of the activity system. The subject's relation with the object is mediated by four elements: rules, tools, community and division of labour, all of which carry cultural meaning and historical development (Ala-Laurinaho & Koli 2007, p. 26).
Object	Raw material or problem space being worked on, a horizon never fully reached.
Outcome	Desired result of working on the object.
Tools	Conceptual and material artefacts for understanding or transforming the object (carry culture, history, skill and knowledge involved in developing them).
Community	Group of people who share the same object.
Division of labour	Horizontal and vertical allocation of responsibility which mediates relationship between the community and the object.
Rules	Mediate the interaction between the subject and the community, as well as between the subject and the object.

Source: Engeström, 1999b, 2005; Daniels, 2001; Peal & Wilson, 2001, Ala-Laurinaho & Koli, 2007

3.4.2 The three generations of activity theory

There are three generations of activity theory. Although this study uses the second and third generation activity theory as a unit of analysis, it is important to discuss the first generation because it provides the foundation of the other two. The first generation consists of a triad subject-tool object conception of activity system and is attributed to Vygotsky and Leont'ev (Figure 3.1; Edwards, 2005a). Vygotsky concentrated on the symbolic mediation of culture, analyzing the relationship between human action (the individual) and cultural artefacts (tools) in order to dispense with the individual/social dualism and create a Marxist psychology (ibid.). He argued that people learn from their culture and history by applying its conceptual and material tools to transform the object. One of the most important results of his work was the linking of the individual to the environment using tools for mediation, moving away from the tradition of treating people apart from their cultures. Leont'ev shifted the focus from mediation tools to the object in the triad and argued that activities are motivated by their object, resulting in the revealing of the object-oriented nature of learning and doing.

3.4.2.1 First generation CHAT

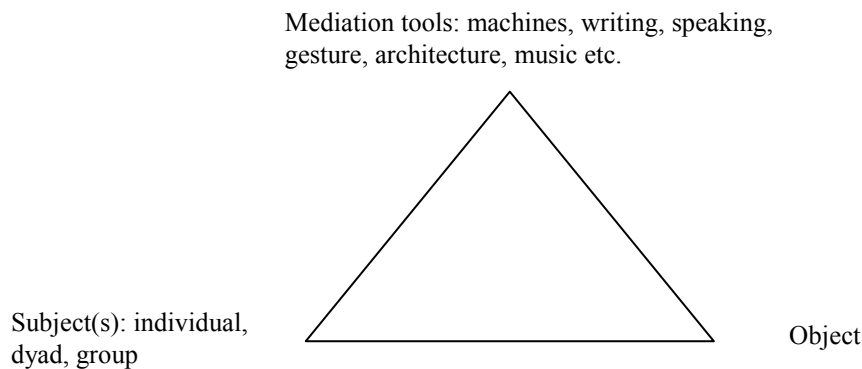


Figure 3.1: Vygotsky's mediational triad

Source: Engeström, 1987

An example of first generation activity theory in an agricultural setting would consist of a farmer or farmers as the subject, using agricultural manuals that carry culturally developed symbols as well as tools such as hoes and seed that also carry in them the knowledge of those now gone who designed and selected them. The object in this case would be food or income that might be generated from the sale of that food. Vygotsky's primary interest would be in the manual, hoe and seed as they mediate the relationship between the farmers and the object of their farming. Leont'ev, on the other hand, would have primarily been interested in how the object of farming is driving the learning and development practices among farmers.

3.4.2.2 Second generation CHAT

Second generation activity theory was developed by Engeström based on the work of Leont'ev and the first generation activity theory but it adds more components to the triad, thus creating „a triangle of mediates“ by infusing social relationships: adding the community, rules and division of labour. Engeström and Ahonen (2001) in their paper that discusses the materiality of social capital, point out that the three mediated sub-systems of human activity are: production which is mediated by tools; exchange, which is mediated by rules; and distribution which is mediated by division of labour. Second generation CHAT is based on Leont'ev's development of an activity system (see Figure 3.2). The importance of second generation CHAT was that it brought interrelations between the individual and his/her community into focus (Daniels, 2001). To add to the example given under first generation, this would mean recognising that there are rules that govern production and exchange of what farmers produce. These rules could be natural, such as soil and weather conditions which impact on what could be raised and when; or they could be made by people such as land tenure and pricing of agricultural inputs. This would also mean recognising that there are other stakeholders in farming and these could be extension workers, consumers, regulators or

input suppliers. The third addition would be division of labour that should happen for the production of agricultural commodities to take place. Seed selection, sowing, weeding and harvesting could be some of the roles. Differences extend to the additional relationships between the different elements of the activity systems (see Figure 3.2).

Second generation CHAT

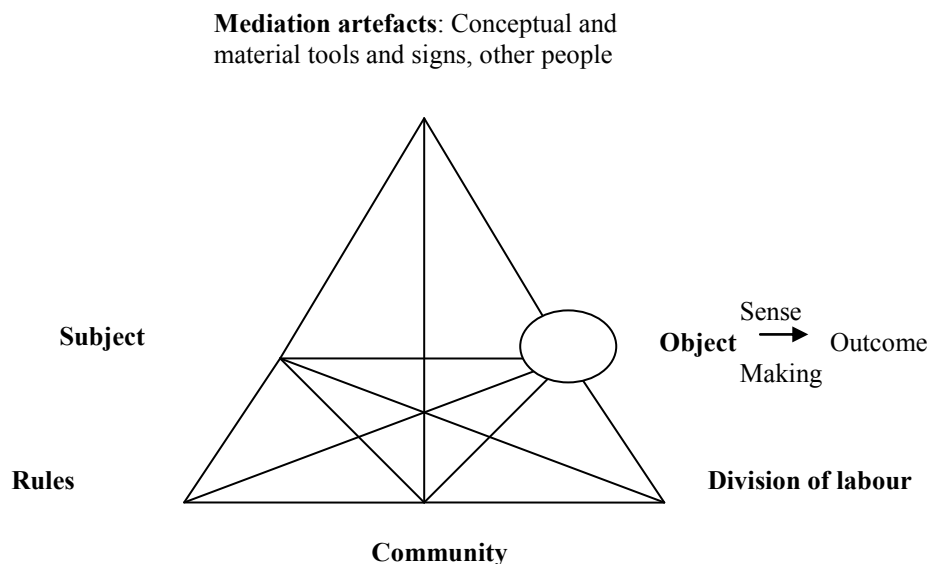


Figure 3.2: The structure of second generation human activity theory model

Source: Adapted from Engeström, 1987, p. 178

The main thing that distinguishes one activity system from another is the difference in their objects (Daniels, 2001). The central relationship is between the subject and the object, which is mediated by conceptual and material tools. The subjects are often part of a community and their relationship with it is mediated by rules, while communities help achieve the system's outcomes through division of labour (Peal & Wilson, 2001). An activity system is heterogeneous and multi-voiced (Engeström, 2005) because subjects construct the object of the activity system in different and conflicting ways due to perspectives which are informed by their histories and positions in the division of labour (Engeström, 2001).

3.4.2.3 Third generation CHAT

Third generation CHAT exists when there is more than one activity system of the second generation and there is interaction between the activity systems (see Figure 3.3). Third generation activity theory was developed by Engeström (Edwards, 2005b) and focuses on the interaction between different activity systems. In more recent literature, the nature of the interaction seems to have shifted from the notion of a central activity system interacting with others (see Figure 3.3) to that of a number of activity systems that are in interaction and have a shared object (see Figure 3.4). Learning between such systems involves boundary crossing,

a concept which is central to this study. For example, in Chapter 2 social learning was discussed (Pretty, 2002; Wals & van der Leij, 2007) and how it needed to work with different knowledge sources and people, and in particular how people-centred learning and innovation is built on boundary crossing (see Section 2.5.5). Pimbert's (2009) notion of a peer reviewed network discussed under the same sections also underlines the notion of boundary crossing. Figure 3.3 below captures the notion of a central activity system and effectively provides the basis for the notion of four levels of contradictions to be discussed later (Engeström, 1987).

Taking the farming activity system discussed earlier under first and second generation, the third generation CHAT represented by Figure 3.3 would interact with government as a rule producing activity system, agricultural colleges and universities as tool producing activity systems and HIV and AIDS as a subject producing activity system which has a bearing on division of labour as well. The main use of showing these connections is to show what kinds of contradictions are caused by these relationships and to use them as potential sources of learning (see Section 3.6.4 and Figure 3.5). Such contradictions are called quaternary. Pesanayi's (2008) issue about conflicting messages from extension workers and NGO facilitators to farmers and creating ambivalence for the farmers exemplifies how tool producing activity systems can cause quaternary contradictions. The other kind of contradiction is the one that arises when the object of the current activity system changes and becomes more advanced. In the example of farmers, the new additional object could be to produce herbs for medicinal purposes or to produce crops for bio-fuel or to improve the micro-life in soils in order to facilitate the sinking of excess carbon. Such a contradiction between objects of the current and new activity system is called tertiary. The other two forms of contradictions are primary and secondary. The primary contradiction exists within an element of an activity system. For example, structural tensions between farmers as subjects of the same activity system are primary with farmers. Babikwa (2003, pp. 193-194) identified such a contradiction in his study of farmers involved in sustainable agriculture in Uganda:

There was a fascinating coexistence between a strong spirit of dependency and self-pity, side-by-side with clear individualism and selfishness. The very people who shunned attempts towards cooperation and collective problem-solving were not only eager to receive, but were also at the forefront of demanding free handouts.

In a study on organic farming in Finland, Seppänen (2004) identified and worked with research participants' primary contradiction which lay in the economic and ecological interests of the farming family. There was a primary contradiction within the object. Secondary contradictions occur between elements of the same activity system such as between the tools and the object. For example, if a farmer wants to use organic chemicals to control pests and thus avoid or minimise ecological harm and maintain food safety, and fails to find an effective biological or mechanical tool, she/he faces a contradiction between the

tools available and the social and ecological object of farming. I found this (Figure 3.3) conceptualisation useful for identifying contradictions that farmers and sustainable agriculture facilitators were facing and it forms the main framing of Chapter 6.

The main thrust and value of third generation CHAT as represented in Figure 3.4 is when actors belonging to the different activity systems are prepared to work together towards a shared object which they construct collectively. It is in this conceptualisation of third generation CHAT that the idea of boundary crossing gains significance because the actors from the different activity systems, after jointly developing a shared object, must cross into unfamiliar territory and develop new solutions with people who have different perspectives and backgrounds. The study used this representation of third generation CHAT (Figure 3.4) in the change laboratory workshops where mirror data in the form of contradictions was used to trigger learning and development processes along the expansive learning cycle. This framing of third generation CHAT forms the framing of Chapter 7. CHAT language also needed to be adjusted in some cases and when research participants found it difficult to work with contradictions, we worked with the more familiar word or problems (see Chapter 6).

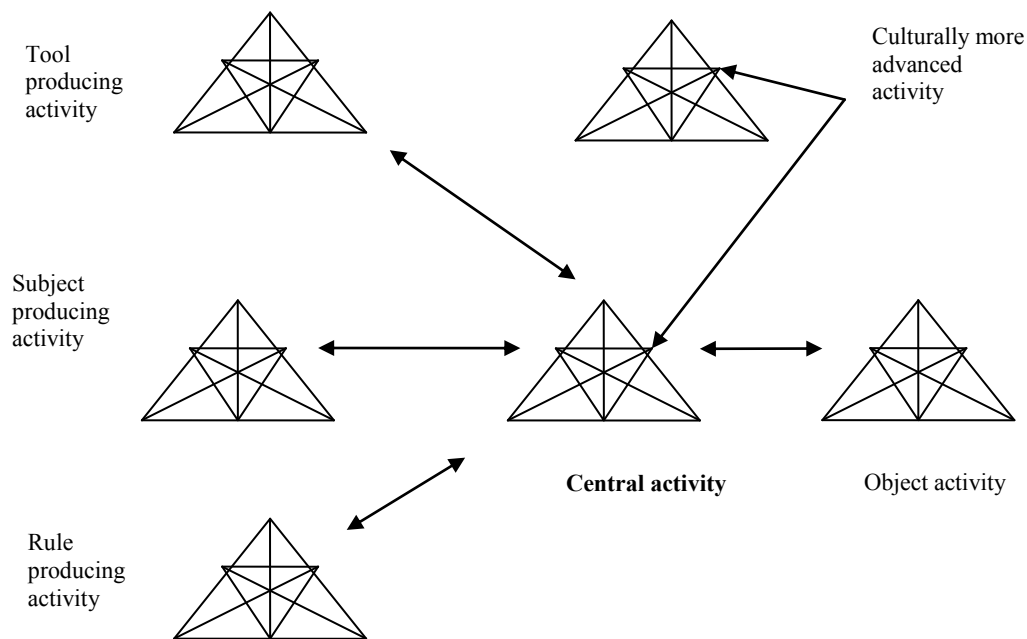


Figure 3.3: Third generation activity theory: Idealised network of activity systems
 Source: Adapted from Engeström, 1987, p. 89

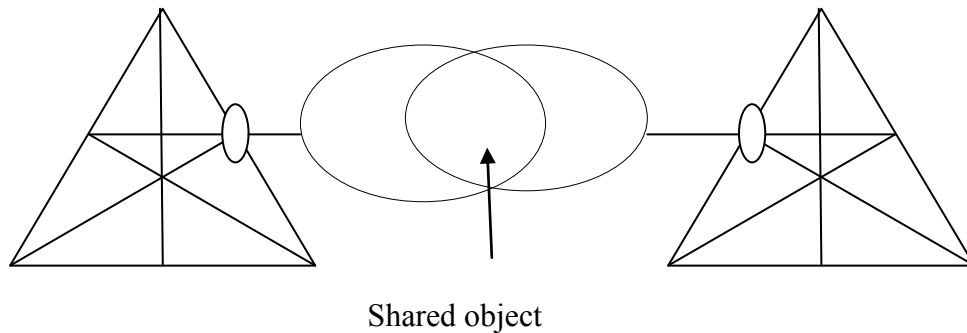


Figure 3.4: Two interacting activity systems as minimal model for the third generation of activity theory

Source: Engeström, 2001, Figure 3, p. 136

3.4.3 Principles of third generation CHAT

CHAT has three main components: system, learning, and developmental components (Dick & Williams, 2004). It uses systems based thinking in order to gain insights about the real world. It is based on the proposition that learning is a social and cultural process, which benefits from historical achievements. Engeström (2001a) suggested the following five principles guide third generation activity theory:

- a. The prime unit of analysis is a collective, artefact-mediated and object-oriented activity system seen in its network relation to other activity systems.
- b. Activity systems are multi-voiced and are a nexus of many points of view, traditions and interests. Multiple layers and strands of history are embedded in the rules and division of labour. The multi-voicedness of the activity systems is a source of both tension and innovation.
- c. Activity systems take shape and are developed over long periods of time. This principle is called historicity. Activity systems should be analyzed in terms of local history of the activity, its objects and outcomes as well as in terms of the genealogy of conceptual tools that have shaped it over time.
- d. Contradictions between and within activity systems are potential sources of change and development. They are *historically accumulated structural tensions* between and within systems. Activity systems are also seen as open-ended learning systems that can adopt new elements from outside, which can create contradictions.
- e. Activity systems have the potential for expansive transformations, which occur through relatively long cycles of qualitative transformations. Expansive transformation happens when the object and motive of an activity have been re-

conceptualised to embrace a much wider horizon of possibility that was the case in the previous activity system.

3.4.4 Potential application of CHAT in the study

Earlier in this chapter (see Section 3.4) I pointed out that CHAT was to provide the backbone of the theoretical framework in the study. This subsection summarises CHAT's potential application in the study. CHAT enables the analysis of contradictions that are inherent in the different voices (Roth & Lee, 2007) of sustainability present in sustainable agriculture activity systems (see Section 2.5.5) the economic, social and ecological values and interests. CHAT provides mechanisms for dealing with dialectics to achieve learning and knowledge generation. My other reasons for proposing to use the activity theory in the study are that it provides me with a methodology – the Developmental Work Research (Engeström, 1987; Engeström, 1999; Warmington et al., 2005; Edwards, 2005a, Roth & Lee, 2007) to:

- a. Illuminate and expand the learning taking place in communities that are promoting and practising Permaculture, Organic Farming and the Machobane Farming System (MFS);
- b. Look into how sustainable agriculture practices have emerged and the way they have been learnt and developed, that is, historicising and retrospective learning;
- c. Establish how farmers are currently learning sustainable agriculture, that is, contemporary learning;
- d. Identify and analyse current limitations occurring in the immediate and wider contexts as a basis for expansive learning; and
- e. Deal with new and emerging challenges to produce future tools through the second and third generation activity theory (see Section 1.5).

3.5 THEORY OF PRACTICE

As this study was interested in sustainable agricultural practices and learning (see Section 1.3), Bourdieu's theory of practice (see Section 1.7.2) was helpful to explain practice and offer important insights into how the subconscious mind is implicated in the process of learning (Bourdieu, 1990). Bourdieu's theory of practice extends aspects of CHAT, by offering explanations for the unconscious actions that people may take and helps us understand the complexity of change processes and the nature of the activities/practices that form the object of CHAT (Lotz-Sisitka et al., 2008). Hodkinson et al. (2007, p. 403) concluded that for Bourdieu, "the habitus is made up of a battery of dispositions which orientate a person towards all aspects of life. They are embodied, incorporating the emotional, the physical and practical as well as the cognitive". Hodkinson et al. further argued that dispositions are at least partly tacit, enduring, but changeable and that they are developed throughout life. These dispositions influence activities in CHAT systems.

Forrester and Hsun-Chih (2007, p. 261) explain Bourdieu's concept of practice as:

A philosophy of action condensed in a small number of interrelated concepts such as field, positions, capital and habitus or dispositions. Basically, field is a social context where people are situated and practise, comprised of positions occupied by people. A field may represent a particular workplace or a non-workplace setting; it may also represent a context within or broader than a workplace ...When people undertake activities in a field or in fields, the capital related to their positions unavoidably interact through power relations which in turn influence human practice. Since learning is highly practice based, fields, positions and capitals influence learning.

Elias in van Krieken (2001) saw habitus as socially constructed and used the term „second nature“ to describe it. Bourdieu argued that the cornerstone of practice is the interplay between habitus and fields, the subjective and objective respectively (Forrester & Hsun-Chih, 2007, p. 262). Bourdieu cautioned that dispositions may result in the reproduction of the status quo:

Thus the school institution, once thought capable of introducing a form of meritocracy by privileging individual aptitudes over hereditary privileges, actually tends to establish, through the hidden linkage between scholastic aptitude and cultural heritage, a veritable state nobility, whose authority and legitimacy are guaranteed by the academic title. (Bourdieu, 2003, p. 22)

Understanding individual and societal dispositions therefore offers a potential mechanism to help to transform them in a way that is consistent with the development of agency in critical realism and CHAT. Bourdieu's theory of habitus therefore enables the search for forms of causal mechanisms in individual acts and activities that may appear irrational on the surface – as well as explain certain tendencies. Bourdieu's work therefore helps us to understand the nature of practice and how it is shaping learning in activity systems.

3.6 CONCEPTUALISATIONS OF LEARNING

As indicated in Chapters 1 and 2, the study was primarily interested in understanding and expanding farmer learning processes with a view to improving sustainable agricultural practices. As discussed in Chapter 2 (see Sections 2.4 and 2.5), agricultural extension and training in southern Africa has in the main worked with top down and more recently, participatory concepts of learning. This study aimed to develop this body of theory and practice further. It was therefore important for me to draw out and draw on conceptualisations of learning that would help me address the research questions. Key concepts relevant to the contextual learning and development challenges discussed in Chapter 2 are:

- Zone of Proximal Development (ZPD);
- Learning as connection with history and context;
- Learning as a mediated process;
- Contradictions as fertile ground for learning;

- Expansive learning;
- Learning as building/enhancing agency;
- Learning as having intentionality;
- Identity and learning;
- Learning, learning levels and tools; and
- Explanatory principle.

In the next subsection, I discuss the meaning of each and how each was relevant to the focus and context of the study (Sections 3.6.1 to 3.6.10).

3.6.1 Zone of proximal development

Vygotsky's theory of a zone of proximal development provides a way of understanding how farmers were learning and practising sustainable agriculture and how such learning and practice could be improved from the current level to the next possible level among the farmers concerned (see Section 1.5). I found the following definition of ZPD comprehensive for purposes of the study: "a zone of human development, the frontier where we can find the links between the situated-embodied mind and the cognitive mind; the individual mind and the social mind; the development already attained and the development to be attained" (Del Rio & Alvarez, 2007, p. 301). Chapter 2 indicated that even though there has been a shift towards participatory research and learning, and people-centred learning and innovation, this was what is desired and not yet attained. I was particularly interested in how the development already attained moved towards a new desired state through co-configuration of that new state as well as the joint thinking and action of those involved so that a practice or an activity systems (see Section 2.54 & 2.5.5) could be improved based in the Engeström's (1987) extension of the concept of ZPD beyond human beings to their activity systems. Vygotsky's concept of ZPD shows the openness of development of an individual to diverse possible trajectories. It does not work with current actual development level which looks at mental development retrospectively but rather considers it prospectively (Del Rio & Alvarez, 2007, p. 278). The „frontier character“ of Vygotskian concepts can be described as follows:

... directs our gaze towards the intermediate area between the internal and the external, the individual and the social, the material and the symbolic, the static and the evolutionary. This no-man's land, generally left uncultivated and unexplored in dualistic approaches, was for Vygotsky, the vital zone for understanding the human mind. (Del Rio & Alvarez, 2007, p. 282)

This study, however, focussed not on the individual but the collective, not on the actions and thoughts of the individuals' ZPDs but the activity system, because it was interested in improving practice in each case study including but also beyond the individual person. It did this by looking at how learning and development of selected sustainable agriculture practices

were taking place in activity systems found in three case studies (see Section 1.3 and Chapter 5). Engeström's concept of the ZPD of an activity is that the recurrent double bind situations in individuals' daily action in an activity can be overcome by collaboratively creating a historically new form of the activity that has become culturally possible (Virkkunen & Schaupp, 2008). To work at the collective level did not necessarily negate learning at the individual level, but it shifted the focus and lifted the level. This introduces the notion of expansive learning (see Section 3.6.5) that takes place at the activity level in the context of collective learning. Lehenkari (2006, p. 51) drawing on Powell pointed out that "if the knowledge base of industry is complex and expanding and sources of expertise are widely dispersed, the locus of innovation will be found in collaborative networks whose interaction is primarily based on learning". In sustainable agricultural practices being examined in this study, the knowledge and experience were considered to be widely dispersed among different farmers, organic facilitators, marketers and conventional extension workers who were invited to reflect and plan together.

According to Edwards (2005a), there are three conceptualisations of what happens in expansive learning: firstly scaffolding, where the learner moves to the next level of understanding with the assistance of a more knowledgeable other. The second is cultural interpretation of learning where the more knowledgeable other links the novice's everyday knowledge and scientific knowledge through instructional conversation, leading to mature concepts. Scaffolding is a process that enables a child or a novice to solve a problem, carry out a task or achieve a goal which would be beyond his unassisted effort (Wood, Bruner & Ross, 1976 in Tarulli & Cheyne, 2005, p. 135). The developmental telos/goal of scaffolded instruction is mastery or being able to perform when the scaffold is withdrawn (Tarulli & Cheyne, 2005). The social relationship is asymmetrical, hierarchical and developed around the goal of instrumental control. A knowledge differential can also be seen as a power differential in ZPD. The asymmetry arises from a third factor, beyond self and other, from which knowledge and power flow, the authoritative third voice implicit in dialogue (Tarulli & Cheyne, 2005, p. 137). Edwards (2005a, p. 2) noted that mainstream educational theory argues that the educator should help move the learner from "situated everyday understandings" to "scientific concepts which are powerful and situation free". Simovska (2005, 2008) pointed out that the ZPD concept suggested a shift in the focus of learning theories so that they give deeper consideration of the interaction between cognition, context and practice. She further noted that this shift in focus results in a change of the unit of analysis from the individual to the dynamic interaction between the individual and the social environment (Simovska, 2005, 2008), thus making learning more relational and socio-cultural (Simovska, 2008, p. 64).

The third layer of learning, which is the primary focus of this study is concerned with a collectivist interpretation of learning and takes place when a group of people with different experiences and perspectives and working on the same object seek to work on new problems and jointly develop new knowledge or tools to address the problems (Lave & Wenger, 1991; Engeström, 1999; Edwards, 2005a; Daniels, 2001, 2007). This third level of learning leads not only to the growth and development of the individual's knowledge, but also leads to the transformation of the activity system. Simovska (2008, p. 75) illustrated how health students and their teachers utilised the concept of collectivist learning in a participatory and action oriented learning approach where there "was no pre-formulated, fixed content, or body of knowledge in the health domain that the students had to learn, memorise, recall, and employ". The students used information and communication technology as well as cross-cultural collaboration and their teachers' guidance to address the health challenges they had identified to see how information and communication technology was utilised by research participants in this study as part of learning to address a contradiction. This is where the intention to expand practice through change oriented learning in sustainable agriculture is found (see Sections 1.5; 2.2; 2.5.5 and 2.7). Collectivist learning covers externalisation and is also called expansive learning (Engeström, 1999b; Warmington et al., 2005; Edwards, 2005b). Speaking to the concept of externalisation in her study discussed above Simovska (2008, p. 77) noted that "the process of collaborative production allowed for the processes of collective learning to take place, leading gradually to common frames of reference ... One of the crucial aspects in this regard was externalisation or objectification of jointly created ideas and meanings into products." Expansive learning takes place when conflicts, contradictions and limitations in the activity system or between activity systems are identified, contextualised and analysed and solutions to them are jointly developed by the subjects in an activity system or interacting activity systems (Engeström, 2005) as noted in Section 3.4.3 above. Simovska (2005) concluded that collective learning which involves the joint construction of the zone of proximal development and the collective achievement of learning and action intended constituted genuine participation. This addresses issues of power and ownership (see Section 8.2) and how issues of power and ownership arise which is of interest to this study.

3.6.2 Learning as connection with history and context

The history of human development is characterised by learning. History produces artefacts that are used in the future. Different places offer different learning affordances sometimes because of cultural tools that may or may not be there but at other times because of ecological environments. People will not learn how to fish where there are no rivers or to practice certain forms of agriculture where temperatures are too low and rainfall is minimal. Context can also be socio-political and economic and this can either enable or constrain learning. For example, a policy that supports the learning and practice of sustainable agriculture is potentially enabling but if there is no budget set aside to support the implementation of such

as policy this will constrain learning and practice. One of the most important contributions from CHAT is the significance of history and culture in the mediation of learning. One of the strengths of activity theory is that it combines theory and practice and links the individual to their environment in order to understand how they learn, thus overcoming the dualisms of the individual and culture (Edwards, 2007). Engeström (2005, p. 134), commenting on the value of activity theory, says, “The individual could no longer be understood without his or her cultural means; and the society could no longer be understood without the agency of the individuals.” In the theory of practice we find that dispositions developed over decades, shape how learning may happen. In critical realism, current human development, which includes learning, can even be determined more by the past than by the present as Archer (1998, p. 371) noted:

The actors here present are not responsible for creating the distributions, roles and associated interests within which they live. Equally important is the crucial recognition that the pre-structuring of actors’ contexts and interests is what shapes the pressures for transformation by some and for stable reproduction by others, in the present.

In this study I worked with history to understand the evolution of agricultural practices (see Section 1.7.5.2) and how such evolutions created tensions as potential fruitful sites of learning as well as to understand how southern Africa and indeed the world come to be using certain learning and development approaches (see Section 2.4 and 2.51-2.5.5). I also use history to look for dispositions that may have a bearing on the learning and practice of agriculture (see Section 3.5).

3.6.3 Learning as a mediated process

Both learning and practice are mediated by tools according to CHAT. An understanding of how farmer learning and practice is mediated is central to the study because only through an understanding of this can one make proposals to improve it. “The structural uniqueness and developmental course of human psychological processes emerge in the process of humanity’s culturally mediated, historically developing, practical activity” (Cole & Hatano, 2007, p. 110). Culturally mediated refers to the psychological and material artefacts, which are used for mastery of behaviour and nature respectively (ibid.). Vygotsky and Luria (1930/1993 in Cole & Hatano, 2007) pointed out that the turning point for human phylogeny was the appearance of labour and symbolic mediation; the major turning point for ontogeny was the coming together of culture-history and phylogeny with the acquisition of language (p. 110). In CHAT the learning of an individual or group of people in the activity system is mediated by conceptual and material tools or artefacts as well as by other people. The relations between the subject and the object of the activity are mediated by rules, division of labour and by the community in the activity system. What mediation does is to enable representation, that is, the presentation of absent stimuli, through symbols. “Specifically the

inclusion of symbolic operations makes possible the appearance of a psychological field completely new in composition, not based on what is at hand in the present, but presenting a sketch for the future, and in this way creating free action independent of the direct situation” (Vygotsky, 1930, 1984, 1999, in Del Rio & Alvarez, 2007, p. 292). A symbol in this case can be a map of a distant place showing train routes and schedules that allows the reader to plan a visit in a manner that would not be possible without that map. An example in the field of agriculture would be information on the potential effects of Genetically Modified Organisms on seeds, which will not germinate when replanted. Such a piece of information makes it possible to make a decision about the future that would not have been possible without the language symbols. The seed that would fail to germinate if replanted is thus represented by literature. Furthermore, cultural memory develops through the elaboration of meditational means by which memory is accomplished and the cultural practices that incorporate the new mediators (Cole & Hatano, 2007, p. 111). Culture, according to Vygotsky and Luria, could be understood to mean “the entire pool of artefacts (including language, norms, customs, tools, values) accumulated by the social group in the course of its historical experience” (Cole & Hatano, 2007, p. 111). In the discussion of Machobane Farming System in Chapter 1, I noted how cultural practices influenced its development.

3.6.4 Contradictions as fertile ground for learning

The idea of using contradictions as potential sites of learning and development is found in both critical realism and CHAT as well as in Wals’ concept of social learning (see Section 2.6). Contradictions are structural tensions between related issues that pull in opposite directions and may manifest themselves as conflicts on the surface. They are a form of disturbance or dissonance. Sawchuk noted that when a contradiction is encountered, there are two possible ways in which the people concerned can respond:

In general terms contradictions are dealt with in one of two general ways - either people change their practices and identities to match an activity system which foments and sustains a basic contradiction (what is sometimes called 'contracted' or 'degenerative' activity) but allows them to cope personally; or, the object-relatedness of activity is changed, through the alteration or introduction of new artefacts, that resolve various forms of contradiction leading to what is called expansive learning. (Sawchuk, 30 June 2009, personal communication)

In CHAT contradictions happen when there is a clash within or between elements of activity systems and serve as potential driving forces of change, development and learning. They provide the starting point for reviewing the tensions and creating opportunities for analysis and problem solving during which more learning and meaning making happens. When contradictions are resolved, learning happens and a more advanced activity system emerges (Edwards, 2005a). The resolution of structural contradictions may result in a more advanced activity system. As discussed in Section 3.4.2.1, there are four levels of contradictions: primary, secondary, tertiary and quaternary. Primary contradiction happens within elements

such as the artefacts or the rule; secondary contradiction occurs when there is tension between one element and another in the activity system; tertiary contradiction happens when the old activity systems clash with a more advanced activity system, while quaternary contradiction occurs when the central activity clashes with any of its neighbouring activity systems (see Figure 3.5).

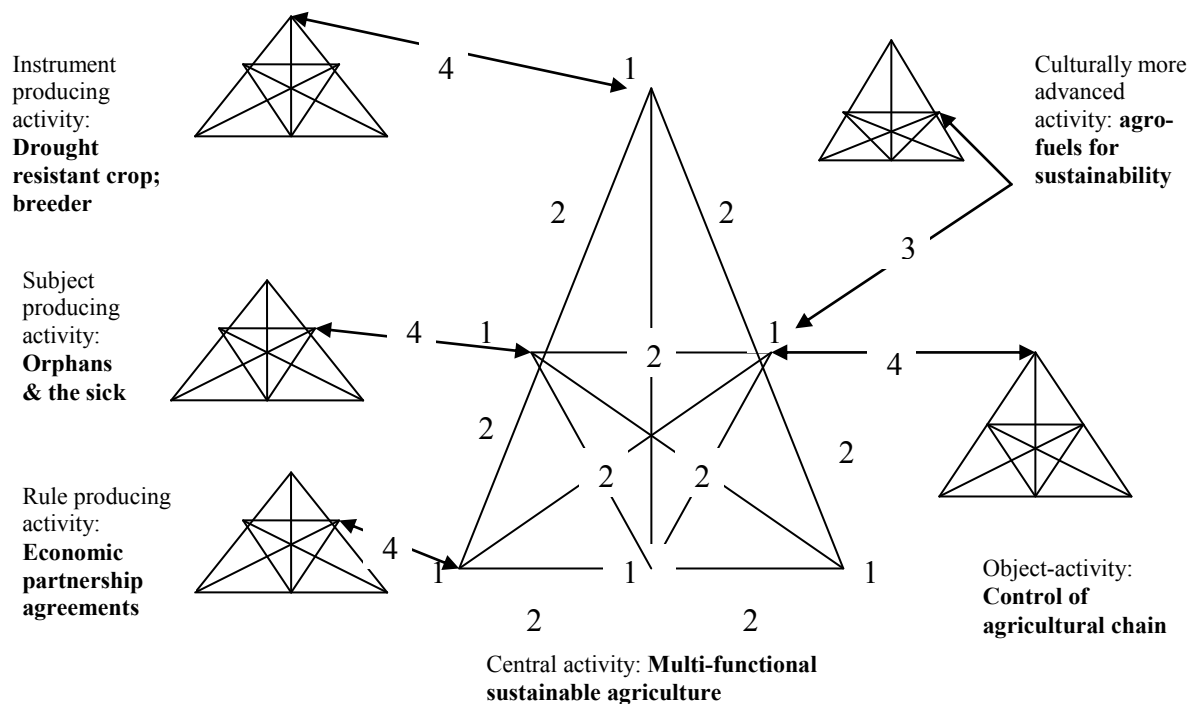


Figure 3.5: Third generation activity theory and the four levels of contradiction

Source: Adapted from University of Helsinki, undated

Other sources of contradictions which are potentially useful sources of learning are the multiple perspectives and voices that subjects come with. Engeström (1987, 1999 in Warmington et al., 2005) notes that activity systems are multi-voiced and are a nexus of many points of view, traditions and interests. In the cases reported here, the voices were not only of the people but also of the three components of sustainable agriculture: ecological, social and economic. Seppänen (2004) conducted a study on learning challenges in organic farming and discovered that one of the main structural contradictions was that between looking after the natural resource base and short-term market interests. For example, climate change manifests itself as an ecological voice, while increasing oil prices and spatial food shortages are an economic voice. In this study, contradictions were sought from the history of each sustainable agriculture practice under study; within the activity systems of farmers – the central focus of the study; as well as in those activity systems that interact with that of farmers (see Chapter 6). In networked activity systems „boundary objects“ are the focal points

for analysing and understanding boundary-crossing practices and these may take the form of physical objects, pieces of information, conversations, goals or rules (Warmington et al., 2005). The notion of cognitive justice as advanced by Visvanathan (2006) and Pimbert (2009) in Sections 2.2.4 and 2.5.5 resonate with the concept of bringing different knowledge systems together – distributed cognition to work towards a shared object. Based on a shared object between farmers and their neighbouring activities, the study worked with networked activity systems where boundary crossing occurred.

3.6.5 Expansive learning

Expansive learning is based on the dialectics of ascending from the abstract to the concrete, where abstract refers to partial, separated from the concrete whole and begins with a subject questioning the accepted practice and gradually expands into a collective movement (Engeström, 1999b). Expansive learning is built on overcoming current contradictions and draws on the strengths of joint analysis and concrete transformation of current practice (Engeström, 2005). The process of expansive learning is concerned with the resolution of evolving tensions and contradictions in a complex system that involves objects, artefacts and perspectives of participants (Engeström, 1999b). It involves doing, reflecting and improving the practice, which essentially is praxis at one level, while at the same time it looks at how everyday and scientific knowledge interact (Daniels, 2001; 2005). Expansive learning entails collaborative learning and seeks to address new and emerging problems, creating new knowledge, and building local resilience (see Sections 2.3.6.1; 2.5.4.2; 2.5.5.1; 2.5.5.2). Expansive learning offers a framework for understanding forms of learning that do not adhere to standard models of vertical mastery (Engeström, 2001). It is concerned with knowledge creation, and application iteratively (Warmington et al., 2005). Roth and Lee (2007) explained that learning becomes expansive when it contributes to an enlarged room for manoeuvre for the individual whereby new learning possibilities are formed. Individual and collective learning takes place by going beyond the boundaries of individual subjectivity through immediate cooperation towards the realization of common interests of collective self-determination against dominant partial interests (Roth & Lee, 2007) (see Sections 2.2.4; 2.3 and 2.5.5.3).

Expansive learning takes place within three major and inter-related contexts: the context of criticism that is concerned with powers of resisting, questioning, contradicting and debating; the context of discovery, which is concerned with powers of experimenting, modelling, symbolizing, and generalizing; and the context of application highlighting powers of social relevance and embeddedness of knowledge, community involvement and guided practice (Engeström, 2005). The primary focus of the study was to work in the context of criticism and discovery because the time available for the field work component of the study (a little over one year) did not seem sufficient to allow the full cycle to take place. However, in one

of the case studies, it was possible to also engage with the context of application but it was not possible to adequately review the context of application (see Table 4.4).

Completion of a full cycle of expansive learning can take up to two to three years. Given the time available for field work – about a year – I was only able to deal with the context of criticism and to a limited extent, the context of discovery. Study of context of application will be carried out by the research programme, beyond the field work and in ongoing post-doctoral work. Figure 5 shows how an agricultural activity system described earlier will be transformed with the application of expansive learning, which immediately alters the context of the activity (Engeström, 2005). It exploits the existing conflicts and dissatisfactions among farmers, development practitioners, researchers and others involved in and affected by the agricultural practices, inviting them to join in the concrete transformation of the current practice (ibid.). One of the critical aspects of expansive learning is its reliance on „self-organisation from below“, which manifests itself in the „creation of networks of learning“ that transcends institutional boundaries (ibid., p. 174). This is similar to the concept of „citizen-led innovation and socio-cultural networks“ as discussed by Pimbert (2009) and found in Section 2.5.5. It also resonates with Scoones, Thompson and Chambers“ (2008) notion of people-centred learning and innovation (see Section 2.4). In this study farmers and development workers constituted the core of the network of learning. The study was able to bring in agricultural extension workers and entrepreneurs to interact with the activity system of farmers in keeping with the critical aspect of transcending boundaries (Engeström, Engeström & Kärkkäinen, 1995; Warmington et al., 2005) (see Sections 3.4.2.3 and 3.6.4).

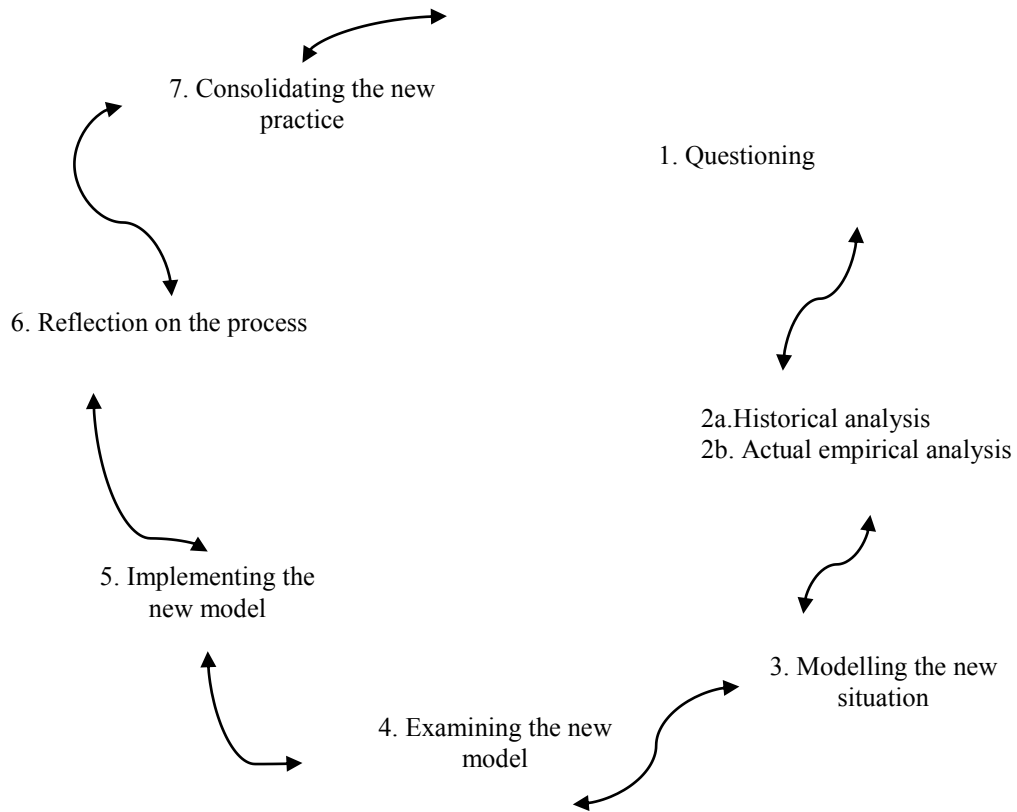


Figure 3.6: Sequence of epistemic actions in the expansive learning cycle
 Source: Engeström, 1999, p. 384

Expansive learning has the following stages:

1. Questioning: drawing on researched evidence to question existing practice or existing wisdom;
2. Analysing: invoking „why“ questions to seek out explanatory principles. Historical-genetic analysis aims to explain the situation by tracing the origin and evolution of the contradiction, while the empirical analyses the inner systemic relations;
3. Modelling: involves the construction of new ways of working or engaging with practice;
4. Examining the model: experimenting with the new model to fully grasp its dynamics, potentials and limitations;
5. Implementing the model: working with the model in real life situations and monitoring its impacts;
6. Reflecting: Using monitoring data to evaluate the model for refinement; and
7. Consolidation: Implementing the refined model into a new, stable form or part of practice (Engeström, 1999a; Pihlaja, 2005).

Wals and van der Leij (2007) pointed out that we cannot think about sustainability in terms of problems that are out there to be solved that need to be addressed, we need to think in terms of challenges “to be taken on in the full realisation that as soon as we appear to have met the challenge, things will have changed and the horizon will have shifted again” (p. 17), meaning that the more advanced activity system will create new contradictions and learning will continue to happen. This resonates with the Ndebele concept reflected in the development song composed with ORAP “It’s nearer, getting nearer where we are going. It’s far, very far where we are going” (see Section 2.5.4, Box 2.3).

3.6.6 Learning as building agency

The concept of agency has already been discussed in Chapter 1 (see Section 1.6.3). Here I will highlight some of its main elements and how I worked with the idea. In intervention studies, one of the researcher’s objectives is concerned with building the agency of research participants to improve their situation. This entails helping enhance their individual, collective and relational capabilities to change those things which work against their needs and interests. There are two main weaknesses of CHAT which are relevant to this study. These require paying attention to relationships between subjects in and between interacting activity systems, how people with different knowledge, expertise and other forms of backgrounds can work together to jointly analyse situations and reciprocally co-construct solutions. The question that is not answered in CHAT is: how do subjects with different expertise responsibly and reciprocally work together to jointly interpret their object and take joint action to transform it? Relational agency is important in activity systems because of the fluidity of relationships and the need to work with different people in and across systems. Edwards (2005a) noted that there is always the possibility of contested interpretation of the object by the subjects. A related gap appears to be the making explicit of the relations between the subjects and the structures that may enable or constrain their actions because Lister, drawing on Sen’s (1999) capability thesis, argued that “what makes a difference is not only how those in poverty choose to act, but also how those with more power choose to act in relation to them” (Lister, 2004, p. 128). Walker (2006, p. 5) defined one dimension of Sen’s capability theory as a broad commitment to democratising our lives and institutions, “learning that is informed by an understanding of its impact on the welfare and interests of those who are likely to be affected by it” (citing Bagnall, 2002). Walker (2006) argues for education that is not only interested in economic development but that fosters „educated hope“ and ethical, critical citizens.

Ahonen and Virkkunen (2001), drawing on Woolcock, when discussing social capital (which I see as closely related to the notion of relational agency) pointed out that it is concerned with the building of social relationships, cooperation, linking activities, bridging specialties and bonding actors – and that the bonding is mediated by a shared challenge or object of a

developmental activity. Relational agency occupies the space between the Engeström's systemic change and Vygotsky's individual sense making. It resonates well with the concepts of reciprocity and mutual strengthening of expertise and competence to increase the collective competence of a community. Relational agency requires the development of a knowing how to know who capacity, which is "the social ability to cooperate and communicate with different kinds of people and experts" (Edwards, 2005a, p. 10). Warmington et al. (2005) used the term interagency to denote relational agency. They define it as more than one agency working together in a planned and formal way, rather than simply through informal networking (although the latter may support and develop the former). This can be at the strategic or operational level (Warmington et al., p.6). In the study I use it to refer to the ability of relations of ties and trust between different groups of people to enable them to work towards a shared object through taking responsible action.

Collective agency is concerned with harnessing the collective strength of people to address a limitation. In the study research participants were able to put together their resources (material and intellectual) to address challenges they were facing following an intervention workshop (see Section 7.2.6). Relational agency was built between groups of people who did not ordinarily work and reflect together to address such issues: teachers and farmers; MFS promoters and conventional agriculture extension workers (see Chapters 7 and 8).

Leesa (2007) criticised CHAT for not paying enough attention to individual needs by subordinating them to those of the activity and of society and yet the individual is relatively autonomous. Similarly, Edwards (2005b) noted:

CHAT has not dealt easily with the idea of the active agent. Writing from a socio-cultural practice end of the field, Dreier comments that „The concrete location of individual subjects in social practice remains strangely implicit or ambiguous...Within Engeström's systems version of activity theory, the subject almost emerges by default where there is enough slippage in the system to allow it to happen. (p. 11)

Dean (2006) pointed out the necessity for both relational and collective agency in bringing about change in contemporary globalised and industrialised society in a manner that makes individual agency inadequate. She noted, "it follows that emancipation can only be a relational-collective undertaking" and disagreed with Bhaskar concerning the power of the individual actor to change things because more and more change is brought about through systems rather than individuals (Dean, 2009, p. 124). She also argued that cultures vary in terms of their need for individually intentional, causally efficacious agency. "Under capitalism commonsense knowledge is displaced by science, and relatedly, the individual intentionality of the artisanal practices borne by face to face social relations is displaced by „system"" (Dean 2009, p. 136). Collective and relational agency becomes especially

important when dealing with open systems, which social sciences often operate in, and in which this study was located.

3.6.7 Intentionality in learning

In his discussion of the methodology of double stimulation in CHAT, Engeström (2008) pointed out that “we need to reconstruct Vygotsky’s more general conception of intentionality and agency” (p. 9). He drew on Vygotsky, who noted on this matter of intentionality that “man [sic] subjects to himself the power of things over his [/her] behaviour, makes them serve his [/her] own purposes” (ibid.). Dean (2009, p. 131) defined intentionality as comprised of reasons and causes. Illeris (2003) brings two important dimensions into individual learning and performance which suggest intentionality. Individuals have emotions and motivations that drive what they learn (or don’t learn). Fundamentally, learning is a desire-based function (Furth, 1987 in Illeris, 2003, p. 173). He argues that learning involves three dimensions: the cognitive, the emotional and the social, which interact to form individual identity. His model treats the individual as a learner with a specific life history, situation and future perspective, different to those of others (Illeris, 2003). In her discussion of agentive talk within the context of CHAT, Sannino (2008) pointed out that in agentive talk, “the speaker expresses his or her intention to act in a specified way” (p. 247). Change Laboratory workshops became an important place and process to established the intentionality of participants (see Sections 4.4.3 and 7.1-7.4) Motivation or intentionality to learn forms an important part of this study because it allows an understanding of why some people choose to become farmers, agricultural extension workers or farm workers, while others do not (see Sections 4.5; 5.3.1-5.3.3; 5.4.1-5.4.3; 5.7 and 8.5.5.6).

3.6.8 Identity and learning

Commenting on identity and learning, Illeris (2003) noted, “Through everyday consciousness we control our own learning and non-learning in a manner that seldom involves any direct positioning while simultaneously involving massive defence of the already acquired understandings and, in the final analysis, our own identity” (p. 172). He further noted similarities between identity and habitus but also spells out three differences: identity is a more accessible academic term; identity is a psychological term while habitus is a sociological concept; identity is generally seen as something that we think, act and learn, while habitus is something done to the individual, the deposition of cultural and societal matters in the individual (Illeris, 2004, p. 437). His model of workplace learning suggests that most learning takes place at the zone where individual identity overlaps with work practice. He also argues that learning involves both the conscious and subconscious, cognition (content) and emotion, that is, motivation or incentive (ibid., p. 435). Illeris (2003) suggests that it is easier for an individual to learn, when the learning does not involve a change in

individual identity. This potentially explains why children born to farmers may find it easy to go into farming (see Sections 4.5 & 5.3.2). This also suggests that the process of „unlearning“ is difficult.

3.6.9 Learning, learning levels and tools

An organisation needs not only its doers and operatives (Level I); its strategists and thinkers (Level II); but also its men and women of wisdom (Level III). (Hawkins, 1991, p. 178)

Engeström's expansive learning cycle drew on Bateson's levels of learning (Engeström, 1987; Nilsson, 2003; Pihlaja, 2005). The learning levels that Bateson discussed are linked to Edwards' conceptualisations of scaffolding, interpretivist and cultural learning. According to Bateson, the first level of learning involves someone learning something in a situation where the goal is given and the means of learning are also given. An example would be learning how to plant carrot seed, with the help of someone when the conditions for doing so are set and conducive. In Bateson's second level of learning, the goal is given and the learner learns by trial and error or experimentation to select the appropriate tool which is already available. He achieves the learning by getting to know the rules of the game and the context. This would mean getting the carrot seed from the shop and learning how to plant it appropriately and discovering for instance that if covered with a lot of soil, it will not emerge from the ground and grow. Such knowledge could be available from other sources but was not known to the learner. The third level involves not merely solving the known problem but going beyond to change the context of the problem so that it can be solved. For example, the carrot might not emerge even after only being covered by a thin layer of soil. The reason might be that the temperature was too low. Changing the context might here mean erecting a greenhouse that traps solar energy. In the expansive learning process, there is internationalisation and appropriation of knowledge through scaffolding; and through linking everyday knowledge to scientific knowledge. These two ways of knowing are linked to Bateson's levels 1 and 2 respectively. Bateson's third level of learning forms the main thrust of expansive learning, which is to jointly find ways of addressing new and emerging problems to which current solutions are inadequate. Wartofsky (1979, in Pihlaja, 2005) proposed three kinds of artefacts that aid learning; these are primary, secondary and tertiary and they correspond with Bateson's three levels of learning. The artefacts that are directly used in production are called primary, for example a hoe in agriculture; secondary artefacts are representations of practices such as training manuals, sustainable agriculture principles and written instructions or diagrams. Tertiary artefacts serve as tools for evaluating and developing secondary artefacts (Pihlaja, 2005, p. 76). The discussion of tools in and for learning is pertinent to this study whose fourth research question (see section, 1.5) is concerned with the development of tools in response to limitations and contradictions that are

being faced in learning and practising sustainable agriculture in the three multiple embedded case studies. Chapters 7 and 8 discuss the development of tools to address contradictions being faced in three separate networked activity systems using change laboratory workshops as the tertiary artefact, to produce secondary artefacts. As part of the reflexivity and contribution to tool development, I propose five secondary tools which can be used by researchers, farmers and facilitators interested in change oriented learning while a further tool on Learning Forums (see Section 9.4) represents a tertiary tool. The point in the study is not to separate doers from strategists or from men and women of wisdom (Hawkins, 1991), but to create opportunities where the different levels of learning can be experienced by research participants.

3.6.10 Explanatory principle

A central interest of the research is to understand why things are the way they are or appear to be. This interest is captured in the notion of explanatory principle found in both CHAT and critical realism. In CHAT the explanatory principle lies in the historical-genetic of inner contradictions in the systems under review to explain daily problems (Pihlaja, 2005, p. 190). In the ontology of critical realism it is found by analysing the causal mechanisms, going beyond the empirical. In their argument for a post-normal science approach to the risk and uncertainty which characterises the risk society, Funtowics and Ravetz (1994) offer an important explanatory principle guiding what kind of science is required to solve what kind of problem. The primary principle is that it depends on the stakes that are involved and the degree of uncertainty about the impact of the object of study (see Section 2.2.4 and Figure 2.1).

3.7 STRUCTURE AND AGENCY

Bourdieu (1990) and Archer (1998) discuss structure and agency. For Bourdieu, the thrust is on how habitus, embedded in people and institutions, can both enable and constrain agency. He draws attention to the need to understand habitus in order to understand why certain decisions and actions happen, as well as to transform them so that they do not produce what is not desirable – something that maintains the status quo. Archer (1998) underscores the importance of analytical dualism of structure/culture and agency, which is in order to see how the two are related and how they can change. The separation of and interplay between structure and agency leads to three accounts: one of structure, one of agency and a third of the interplay between them. She reckons social conditions are necessary for any intentional act. Social structures exist before the individual in the society and the individual can exercise agency to change the structures. She explains the interplay between structure and agency as resulting in morphogenesis through three temporal phases: structural conditioning (the context in which individuals find themselves); social-cultural interaction (what individuals do in interaction with others) and structural elaboration. When such elaboration does not happen,

structural reproduction or morphostasis happens. The individual has agentive force that has what Lewis (2002) called efficient cause to change the structures, which in turn have material cause which have an influence on the final outcome. This means that both individuals and structures that they interact with have causal efficacy. This understanding resonates with Marx's assertion that people make their own history but not in circumstances of their choosing (Hay, 1999, in Lewis, 2002). Archer (1998) also held that it is only partly true that the causal power of social forms is mediated through human agency because there are instances when this is not so, when the actions of the long dead have more causal power, for example, the accumulation of greenhouse gases which are causing climate change began decades ago but impacts on present and future generations; the loss of biodiversity caused by over-exploitation in the past are having an effect on the present. Soil erosion resulting from mismanagement of land in the past is also affecting the quality of land available for farming. In this thesis I use structure and agency to look at factors that are influencing farmer learning and practice and subsequently at how this can be transformed through responsible action. The most important structural issues being faced by farmers in Africa and in the region as discussed in Chapter 2 include under-budgeting of agriculture, research and extension; poor international pricing of agricultural produce and growing corporate nature of the agricultural production chain and the risk factors related to climate change, soil degradation and agrobiodiversity erosion (see Sections 2.2.3; 2.3.5; Box 2.2 and 2.3.6.1)

3.8 CONCLUSION

This chapter discusses the theoretical framework that underpinned the study looking at both the philosophical and epistemological theories and how they relate to each other. The two philosophical theories discussed are critical realism and relationalism, which provide both depth and connection. The epistemological theories of CHAT, structure and agency, and habitus were also discussed and the main concepts that are relevant to the change-oriented learning were examined. The chapter also showed how the sensitising concepts of dialectics, reflexivity and agency were embedded in the theories selected and how they related to each other. The chapter also examined the conceptualisations of learning in relation to the theories selected as learning and development are central ideas in this study. The next chapter (Chapter 4) discusses the methodology that was employed in the study and links it to both the theoretical framing and the questions that are being addressed in this study. It discusses how the research was carried out with research participants, how data was generated, gathered, analysed and processed and some of the reflexivity that happened in the process.

CHAPTER 4: Methodology and methods

4.1 INTRODUCTION

This chapter discusses how I engaged with research participants to collect data with them and from them, and how the data was processed. It therefore shows the linkages between the research participants and the researcher, the cabinet and the field (Massey, 2003) acknowledging the distinction and the relatedness of the two at once in typical dialectical fashion. The chapter also demonstrates how both the research participants and I, as researcher reflexively worked on the issues at hand, therefore jointly engaging in the process of transforming aspects of the activity systems. The research journey was therefore a two-way encounter between two active agents – the research participants and me, the researcher. In the title of the research I used the word „explore“ to show that I intended to find out or investigate something – the object of the study, which is primarily farmer learning and development of sustainable agriculture practices. The research was oriented towards action, doing something about the issues that research participants were facing in keeping with critical realism and CHAT orientations. In this sense, I was an interventionist seeking to enhance the agency of the research participants, especially farmers. Pihlaja (2005, p. 185) noted that the role of an interventionist “is to help practitioners undertake epistemic actions of analysing the need and possibilities for change in their activity”. This resonates with the more recent forms of participatory research discussed in the previous chapter clustered around the notion of people-centred learning and innovation (see Section 2.5.5), which is found within the broader concept of social learning (see Section 2.6) and is specifically called co-learning (see Section 3.4). Wals et al. (2009, p. 17) on the other hand noted that the role of a facilitator in social learning is to keep the process open and transparent, protect participants against risk of participation, deal effectively with conflicts, monitor progress, ensure adequate stimuli and a sense of urgency and “keep the focus on the choices that have been made and the path that has been chosen”. The role of the facilitator/interventionist and the intervention itself appear to be underpinned by the deeper concepts of reflexive and cognitive justice and post normal science in abnormal times (see Section 2.2.4) and Scott’s idea of *métis* as discussed by Pimbert (2009) (see Section 2.6), dialectics, agency and transformation (see Section 2.2.6) and indigenous concepts of learning and development condensed in *zenzele* and *qogelela* (see Section 2.5.4, Box 2.3).

I set out to explore with research participants, focusing on their situations, not on them. This chapter also shows that while there were moments I spent in the field and others I spent at my study station – that is things happening at separate and distinct times and places, these moments were brought together and connected through deliberations between the two active

agents, the research participants and researcher. In that process of engagement, we were able to examine current practice; discuss how farmer learning is mediated; surface learning and development contradictions; model solutions to some of the contradictions; and review them after some time. The journey was characterised by reflexivity as will be discussed later in this chapter (see Section 4.8). There were moments when ethical issues arose and I drew on the work of researchers such as Maxwell (2005) to help me navigate the way (see Section 4.4). The interventionist nature of the research also created ethical challenges of a particular nature. The chapter further discusses how the research ensured validity (see Section 4.4).

Latour (1999) used the notion of „chains of transformation“ in the research processes to show that the connection between the field and the cabinet is long and complex and involves producing new signs at each stage, which results in something being lost – such as locality, particularity and continuity and something being gained such as compatibility, standardisation and relative universality. Inductive analysis allowed me to make sense of the data generated through clustering it into categories based on the notion of „letting data speak“. It is this process which provides the bridge between the two spaces of the „real world“ and the „represented“. My task as researcher was to enable theory-reality congruence (Mukute & Lotz-Sisitka, 2009b), which I did additionally through abductive and retroductive analysis that gave shape to the critical realist project of not only linking the data with theory but also trying to establish „what must be the case“ (Danermark, Ekstrom, Jakobsen & Karlsson, 2002). Latour (1999) preferred to call the data generated and interpreted in these processes, „achievements“. It was at my study station that I brought together these achievements – the recordings, interviews, field notes and reflection notes for a unifying gaze to address the research questions. This chapter discusses how I arrived at the various achievements: how data was generated and analysed; how I encountered and worked with validity and ethical questions; and came to understand my reflexivity in the research journey.

4.2 METHODOLOGICAL FRAMEWORK

The choice of a research methodology, design and methods was shaped by three main factors – the research goal (see Section 1.5), the conceptual framework (see Sections 1.6.1 to 1.6.3) guided by the theoretical framework research design and process (see Chapter 3). The research goal, which was informed by the context of the study (see Chapters 1 and 2), was principally to explore and expand the learning and practice of sustainable agriculture so that this could be done more effectively. The research therefore had an emancipatory interest, critically explaining and enhancing the agency of the research participants in relation to the learning and practice of sustainable agriculture. In this sense, the research was deliberately interventionist reflecting the participatory research interests of recent CHAT research (see Sections 3.4 and 3.6.5) and the explanatory critique interests of a critical realist project, which seeks to develop new knowledge while at the same time acknowledging that such

knowledge is fallible (see Section 3.2). In CHAT terms, this translates to the idea that the „object“ can never be completely understood. As mentioned in Chapter 1, the methodology used within the CHAT framework is called Developmental Work Research (DWR), which is a methodology to intervene in research sites and enable the development of the agency of the research participants. The methodology is discussed in more depth in the next section (see Section 4.2.1).

The research process was divided into two phases, with the first phase focusing on exploration of farmer learning processes and the second building on the understanding of the processes to expand the learning and practices of sustainable agricultural practices under review (see Table 4.1).

4.2.1 Developmental Work Research (DWR) as a form of people-centred learning and innovation research

In Chapter 2 (Section 2.5.5) I discussed the emergence of people-centred learning and innovation, which not only puts the learners first but also makes a conscious effort to link them with other learners as well as other opportunities for learning and development so that they not only enhance knowledge and skills but also change the contexts in which they are operating. A useful methodology for enabling such a process is the DWR methodology because it enables the researcher to intervene in the case studies in ways that enable research participants to address some of the contradictions they may be facing in their sustainable agricultural practices so that they can build more resilient livelihood strategies. The methodology allowed me to be both a researcher and a participant and my role was primarily that of facilitating people to question the way they learn and do sustainable agriculture and related activities and why they tend to get certain results. My other role was to obtain a systemic view of what was going on in their activity systems and reflect that back to them as mirror data, thus making my participation and knowledge of some theoretical tools available for utilisation in their real situations. This made me feel that I was contributing something worthwhile to the research participants and that the research was not merely extractive; at the same time, I was pursuing my academic interests. Beyond the case specific systemic view, I also played the role of linking the three sustainable agricultural practices and looked into the future zone of proximal development (see Section 3.6.1). I connected the peoples in the three different settings as part of building their reflexivity and agency. DWR, which was developed by Engeström, provides a framework in which “learning is conterminous with the creation of new forms of activity, in which activities are learned as they are created” (Warmington et.al., 2005, p. 7). It employs the notion of radical exploration, which results in learning what is not yet there. It is learning that is embedded in and constitutive of a qualitative transformation of the entire activity system (Engeström, 2004, in Warmington et al., 2005). DWR directed my gaze towards understanding learning processes and different levels of contradictions in

activity systems of each case study. Through Change Laboratory (CL) workshops (see Sections 7.2 to 7.4) the approach to research enabled the research participants, with support and the utilisation of CHAT tools to jointly resolve selected contradictions in each case. Participants developed and used criteria to choose contradictions to work with (see Sections 6.2 to 6.5).

DWR is intended to improve the whole activity system not only the individual subject or action. This means that the zone of proximal development is the practice or activity and the intention is to lift the practice to a more advanced state than it was before by addressing current contradictions. At the same time, the methodology acknowledges that when the contradictions have been resolved, new contradictions will emerge and will need to be addressed again leading to the development of an even more advanced or changed activity system. CHAT theorists also assert that the object of learning or practice is never completely understood (see Section 3.4.2). As indicated earlier, this acknowledgement resonates with critical realists' assertion that what we know can be inadequate or wrong, that is fallible (Benton & Craib, 2001; Sayer, 2000; see Section 1.8).

4.2.2 Multiple embedded case studies

A case study is richly descriptive and uses quotes from research participants, anecdotes and prose composed from interviews (Hancock & Algozzine, 2006, p. 16). Case studies can be used to study events, programmes, situations and activities (ibid.). Case studies often require use of multiple research methods of data collection, which is important for ensuring the trustworthiness of findings. The case study strategy allows for investigation of contemporary events, whose time-space configurations are not easily manipulated (Yin, 2003). Multiple embedded case studies (Yin, 2009) are also called nested case studies (Lotz-Sisitka & Raven, 2004) because they are made up of cases within a case. In this study a minimum of two networked activity systems constituted a case study (see Figure 4.1 below for the multiple case study design in this study). The units of analysis in Case Study 1 are the farmers' and the school activity system and the Schools and Colleges Permaculture Programme itself; in Case Study 2, these are farmers, organic facilitators, and organic marketers' activity systems; while Case Study 3 is comprised of the MFS farmers; MFS trainers and government extension workers' activity systems. In each case study, the activity systems are connected to each other because they have a shared object depicted as a small circle between them. The outer circle shows that the case studies are related based on the broad initiative of change oriented learning in sustainable agriculture practices after the work of Lotz-Sisitka and Raven (2004).

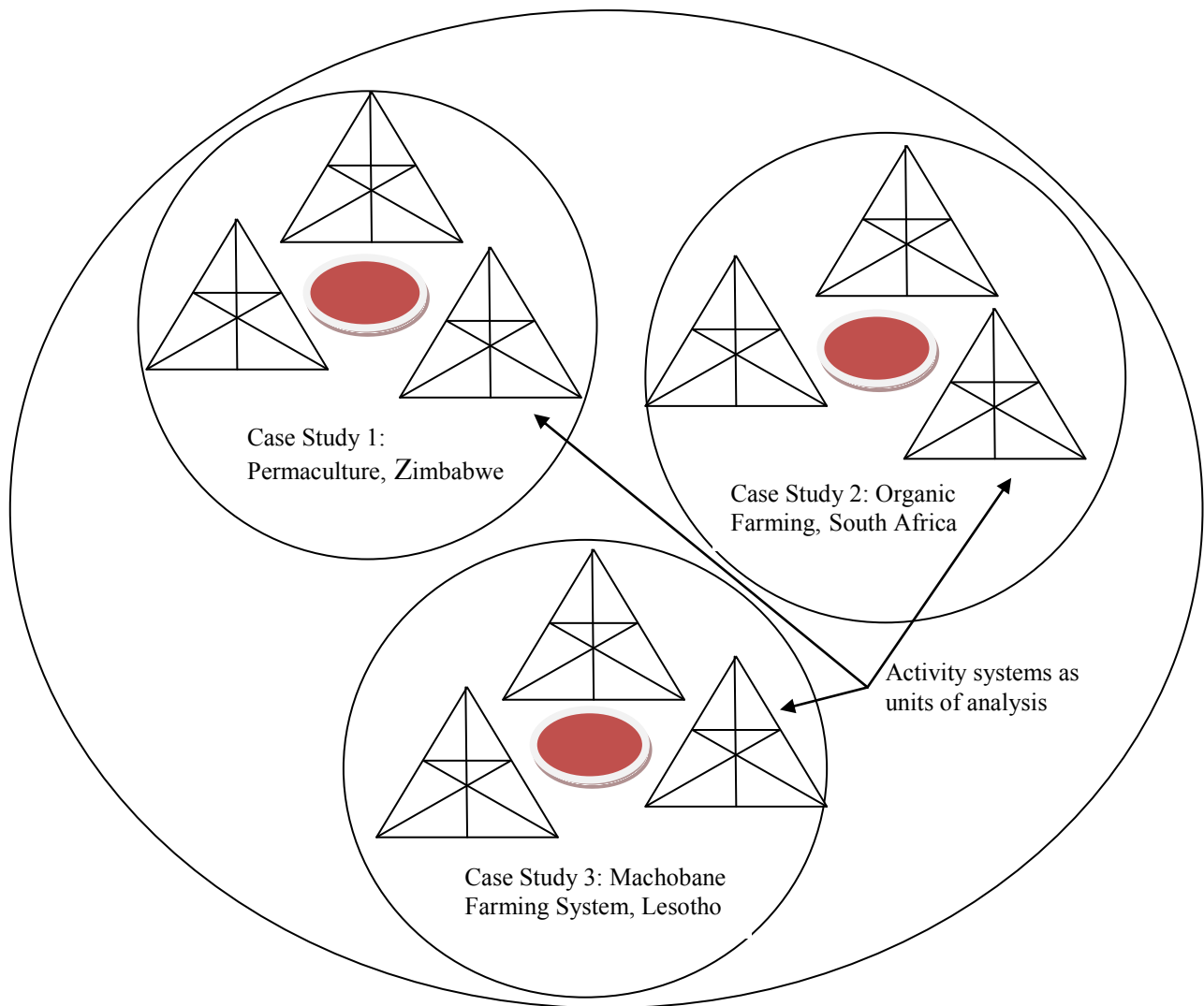


Figure 4.1: Multiple embedded (nested) case study design in the study

4.2.2.1 Why case study research design

As discussed briefly in Chapter 1, I worked in three case study sites (see Section 1.8) and employed a multiple embedded case study design. The decision to use more than one case study was influenced by both practical and theoretical reasons. The theoretical reasons were that multiple case studies as opposed to a single case study are considered to be more compelling and robust (Yin, 2003, p. 53):

The first word of advice is that although all designs can lead to successful case studies, when you have a choice (and resources), multiple case designs may be preferred over single designs... Analytic conclusions independently arising from two cases, as two experiments, will be more powerful than those coming from a single case (or single experiment) alone. Second, the contexts of the two cases are likely to differ to some extent. If, under these varied circumstances you still can arrive at common conclusions from both cases, they will have

immeasurably expanded the external generalizability of your findings, again compared to a single case.

The research questions and the ontological and epistemological perspectives guiding the study (see Sections 1.5; 3.1; 3.2; 3.3 and 3.6) also informed the research design. They suggested that I work with real issues, in natural situations where people were learning and practising relevant forms of agriculture. A research design deals with the logical dimensions of the study, not the logistical (Yin, 2009, p. 27). The case study design seemed most appropriate because it would allow me to work deeply with groups of people in a fashion that resonates with intensive research designs that are typical of research underpinned by critical realist philosophy (Sayer, 2000). They involve intense analyses and descriptions of a single unit or system bound by space and time. The researcher uses them to gain an in-depth understanding of something. Insights gathered from such can be used to influence policy, procedures and future research (Merriam, 2001). The table at the end of the section (Table 4.3) shows the implemented case study design.

4.2.2.2 Case studies and intensive research designs

In realist terminology, the research design was intensive not extensive because it sought to get detailed information and address specific issues being encountered by specific groups of people in the case studies. Sayer (2000) argued that an intensive research design for investigating a human being would start doing so by looking at any part of the body, and then look for connections between one part and another, one organ and another, building a picture of the body's structure and systems. This is what working with applications of CHAT requires (see Sections 2.6; 3.4.2 and 3.4.4). One could start with analysis of the tools, the object or the subject before interrogating their relationships, histories and contradictions both within the activity system and between it and others. Sayer (2000, p. 22) further noted "intensive research seeks out substantial relations of connection and situates practices within wider contexts, thereby illuminating part-whole relationships". Therefore intensive research values context in a similar manner to second and third generation CHAT and its associated methodology of DWR. Sayer (2000) identifies interactive interviews as one of the methods that are suitable for use with intensive research. The idea of building a picture and making connections resonates with Emirbayer's (1997) ontological view of a world that is relational (see Section 3.3). Intensive research in the tradition of critical realism allows for an analysis of structure agency relations in case study contexts as implied by Sayer:

Realists seek substantial connection among phenomena rather than formal associations or regularities. In explaining associations, they seek to distinguish what must be the case from what merely can be the case. Explanation of the social world also requires an attentiveness to its stratification, to emergent powers arising from certain relationships, and to the ways in which the operation of causal mechanisms depends on the constraining and enabling effects of contexts (Sayer, 2000, p. 27).

4.2.2.3 Types and orientations of case studies

Tesch (1990, p. 39) defined a case study as an intensive and detailed study of one individual or of a group as an entity through observation, self-reports and any other means. Berg (1998) discussed three kinds of case studies: intrinsic, instrumental, and collective. He defines an intrinsic case study as one where the intention is to understand the intrinsic aspect of a particular entity. Instrumental case studies on the other hand seek to provide insight into some issue or to refine some theoretical explanation. Collective case studies involve the intensive study of several instrumental case studies in order to allow a better understanding or an enhanced ability to theorize about the larger collection of case studies (Berg, 1998, p. 217). Bassey (1999) also made three distinctions in terms of case studies: theory seeking and theory-testing (instrumental); storytelling and picture-drawing case studies (intrinsic); and theory-generating case studies (collective). The case studies in this research were intrinsic, instrumental and collective; theory-seeking and testing and theory-generating at the same time because while I sought to understand each case study in its own right, I also sought to provide insight into issues of change oriented learning and sustainability practices and because I intended to find ways of explaining workplace learning in multiple sites which contributes to a wider research programme. This research resonates with the following: “the claim to knowledge may contribute incrementally to the accumulated knowledge on the topic under study, challenge existing theoretical ideas; offer significant improvement in practice or provide a significant piece of a jigsaw of understanding” (Lotz-Sisitka & Raven, 2004, p. 81; See section 9.2). Case study research results cannot be generalised to populations or universes, because generalisations create a sense of certainty and absoluteness that cannot arise from case studies (Bassey, 1999; Sayer, 2000; Yin, 2009). Bassey (1999) therefore recommended that insights that are generated from case studies need to be given as general statements that are imbued with a sense of uncertainty, and defined these generalisations as fuzzy. The phrasing of fuzzy generalisations avoids the use of definitive statements to ones that are tentative, using such words as „can“ and „could“ instead of such words as „will“ and „should“ (Lotz-Sisitka & Raven, 2004). This understanding shaped the framing the recommendations in this study (see Sections 10.2.1-10.2.5).

4.2.2.4 Criteria for case selection

The case study research design was employed in this study (as mentioned earlier) because I sought to understand social phenomena within naturally occurring settings: farmers practising, learning and enhancing sustainable agriculture – and relating with sustainable agriculture promoters, high input agriculture extension workers and the corporate sector. Activity systems which are the unit of analysis in CHAT (see Sections 3.4.3 and 3.4.4) lend themselves easily to multiple embedded case studies. I used non-probability sampling to choose cases to study. In particular, I used purposive sampling, also known as theoretical

sampling that involved the selection of cases based on my judgment about what would be most useful (Bloor & Wood, 2006) (see Section 1.3).

As mentioned in the above paragraph, activity systems formed the basic unit of analysis in the study. In each case study, there were several activity systems. Consequently, I worked with what Yin (2009) calls multiple case studies that are embedded, which means that within each case study there are further units of analysis. In the case of this study these units are activity systems as conceived and constructed by different actor groups in each case study (see Sections 3.4 and 5.2).

4.2.2.5 Types of questions that case studies answer

Case studies are best used when one intends to answer the how and why questions (Yin, 2003; 2009). The „how“ questions dominated my research work and for issues that were raised, the study purposefully asked „why“ they were there and how they could be addressed. “In general, case studies are the preferred method when (a) „how“ or „why“ questions are being posed, (b) the researcher has little control over events, and (c) the focus is on a contemporary phenomenon within a real-life context” (Yin, 2009, p. 2). Yin went on to say that research methods are chosen to address one of the following purposes, exploratory, descriptive, and explanatory. The „what“ questions address the exploratory matters in studies, while the „why and how“ seek out explanations. However, missing in this classification are interventionist research efforts, which I would say are concerned with *so what* questions beyond the exploring, understanding and explaining.

4.2.2.6 Case study protocol

As part of the case study design process, I developed a case study protocol as recommended by Yin (2003). The protocol was made up of the following:

- a. Field procedures: I developed and presented a letter of introduction ahead of going into the field. In addition to sending the letter (see Appendix 1) I made phone calls to introduce myself and the purpose of the research. I further developed and sent to each key informant a document outlining what the study was about and what it would require of them and those who would take part. At the end of each field visit I made a point of writing thank you letters (see Appendix 2). I also shared the interview scripts with those interviewed (except farmers in Lesotho because of language problems) and elicited feedback. For each case study visit, I wrote a report and shared it with the research participants for comments and corrections (Case Record 2.5.1; 3.5.1 and 4.5.1). At the end of the data analysis for both phases, I went to each group of participants and debriefed them regarding what had emerged from the research process as well as to ask for feedback from them.

- b. Case study questions: For the first round of data gathering with research participants, I developed a list of questions ahead of the field work and shared them with colleagues for critiquing. I piloted tested the questions before going to the field. For the set of data generation tools used in the first phase see Appendix 3.
- c. A guide for case study report: I developed a framework for analysing data from each case study and the framework was informed by the research questions and well as the theories that I was using (see Sections 1.5; 3.1; 3.2 and 3.3). The discussion of the case record is discussed below (See Section 4.2.2.7).

4.2.2.7 Compiling a case record (CD ROM attached)

In order to ensure that data gathered on each case was properly kept for future use in the writing of the thesis and for evidence of my engagement with research participants, I compiled a record for each case study. In each case record, I kept:

- Samples of key communication with research participants;
- Samples of interview records;
- Plans for Change Laboratory Workshops;
- Reports made on each of the three trips made to each case study;
- Samples of comments on the reports and associated feedback from research participants;
- Selected transcripts of Change Laboratory workshops;
- My reflections on the research processes, including moments where there was need to make adjustments to the research design or process.

When I wrote this thesis, the case study record provided one of the richest sources of data, some of which was semi-processed. I would recommend the use of this strategy to any researcher working with multiple case studies.

4.3 RESEARCH PROCESS

4.3.1 Choosing study sites

The selection of case studies was deliberately purposive as is advised in qualitative research (Yin, 2003). The selection was also strategic in keeping with critical realist intensive research designs by considering cases that are widely practised in some countries of southern Africa; but that have different emphases and are being practised under different social and agro-ecological conditions (Danermark et al., 2002, p. 170). Section 4.2.2.4 discussed the broad criteria for selecting study sites and this section discussed the details of the qualities and factors that I considered in choosing who to research with and where. This process was the first part of getting ready to do field work.

The following is a list of criteria that were used in selecting the case studies:

- Sustainable agriculture practices that had a relatively long history in southern African countries (at least 10 years) and that have demonstrated potential to grow in any country of the SADC region;
- Sustainable agriculture practices that were extensively practised;
- At least one of the agricultural practices had to be indigenous to southern Africa;
- A study site in which sustainability was being incorporated in farming;
- Farmers and trainers who have been practising sustainable agriculture for a number of years who have yielded at least some of the social and ecological benefits;
- Farmers and trainers who have been engaged in the learning, practice and development of the practice for a number of years;
- Farmers working on relatively small holdings as such farmers form the majority of farmers in the SADC region, must be involved; and
- Diversity between the case studies in terms of socio-political and agro-ecological conditions.

There three selected sustainable agriculture practices and study sites were:

- Permaculture practice in Hwedza District, agro-ecological zone;
- Machobane Farming System practice in the districts of Mafeteng and Mohale's Hoek in Lesotho; and
- Organic farming practice in Durban District, South Africa (see Section 1.3).

4.3.2 Negotiating access

Bloor and Wood (2006) underlined the importance of negotiating access in doing social research and defined it as a process by which researchers get access to research settings. They pointed out that in conducting overt research, social scientists have to seek permission to work with potential research participants and that such negotiations are ongoing: from research planning to report writing. It is both a social and physical access, called „getting in“ and „getting on“ respectively. Getting on was achieved through trust building by respecting local customs, listening carefully and keeping promises. I negotiated initial access in each case study through making calls and writing e-mails to people of influence who worked and lived in the research setting that I had selected. At the end of field work, I „left the field“, a social process of withdrawal from field work (Bloor & Wood, 2006) in keeping with good practice. The process of managing and concluding field relationships started with access negotiation and in all three cases had four aspects:

- Giving research participants feedback on what was emerging from the research and getting their comments;

- Obtaining research participants' feedback regarding the progress that they had made in examining and implementing the solutions modelled at the previous workshop;
- Thanking research participants for having taken part in the research process; and
- Bidding research participants farewell.

Details of the process of negotiating access for each case study are discussed below.

4.3.2.1 Case Study 1: Schools and Colleges Permaculture Programme (SCOPE)

In the case of the Zimbabwe Case Study, I went through the Coordinator of the Schools and Colleges Permaculture Programme who gave his consent for me to work with one of the schools in their programme – St Margaret Primary School in rural Hwedza district. The negotiations began in May 2008. This consent was put in the form of a letter that he wrote to the headmaster of the school advising him about my research interest and of the need to allow me to work with them. The headmaster in turn welcomed me and invited the Permaculture teachers in his school to participate. They verbally expressed interest in the study. Two of the teachers then accompanied me to speak to farmers who were practising Permaculture, introduced me and urged the farmers to take part in the research. It was after this visit, that we set dates for interviews. In this sense, my access to some of the research participants was mediated by others and especially by the gatekeeper or the key informant. However, participation in all cases was voluntary. I had direct negotiations with other Permaculture facilitators who were involved in SCOPE but not directly and they gave verbal consent, which was adequate. In each of the two subsequent visits, I reported to the SCOPE coordinator first before visiting the school. Each time I visited the school, I reported to the headmaster first. We would always negotiate the dates and times at least two weeks ahead. These processes of getting in and getting on were therefore not one-off but recurrent. Leaving the field, in Case Study 1, took place in September 2009 after 16 months of engagement.

4.3.2.2 Case Study 2: Isidore community of organic producers and marketers

Negotiating access in the South African case study, which was located in the urban and peri-urban areas of Durban, was less bureaucratic. It began in June 2008 a few weeks after an encounter with an organic farmer and facilitator who presented some of his work at a PELUM workshop. . After securing the interest of this Isidore farm owner, who also networked with local organic farmers and trained new, emerging and established farmers, agreed to help me to identify who I should talk with based on the suggestions that I had made. His consent was also verbal. He hosted me at his place during all three visits to his area. There was potential for ethical and validity issues to arise when a planned feedback workshop failed to happen as planned and I had to negotiate with him as to whom to see in order to obtain the required feedback. One of the criteria for choosing whom to interview was that one of the persons had to be someone with whom he had little or no communication with

after the workshop. The trust that we had built between us appeared to have helped because he not only agreed that we do this but accompanied me and was honest in his answers about having „excluded“ some of the CL workshop participants in the post workshop deliberations (see Case Record Section 3.8.1). I left the field in this case study in October 2009 after 16 months of engagement.

4.2.3.3 Machobane Farming System as promoted by RSDA and MADF

Negotiating access in Lesotho involved talking with a former Board member of PELUM where I used to work and whose organisation, Rural Self Development Association (RSDA) was supporting the MFS, through both phone calls and e-mail communication. After agreeing to the study, she persuaded me to also engage with another NGO – Machobane Agricultural Development Foundation (MADF), whose primary focus was the development of the MFS practice. I then negotiated with the director for access and he also agreed. The study area comprised the two districts of Mafeteng and Mohale’s Hoek. The main gatekeeper, however, remained the director of RSDA. When going to the field, my access was primarily negotiated with this director and the negotiations of timing were generally conducted well ahead of the visits. During the second visit to Lesotho, which similar to the other two case studies focused on holding Change Laboratory workshops, there was a specific request to reduce the planned workshop to two days rather than the proposed four days so that the farmers would not be away from their fields for too long. Some farmers came from very remote areas. The adjustment was made without compromising the planned number of hours for the workshop. Meetings with farmer groups in Lesotho always began and ended with a prayer. The local leader was responsible for welcoming participants.

4.3.3 Phases of the study: exploratory and expansive

4.3.3.1 Phase 1: Exploratory phase

Getting on with the study involved making: preparations before the study; adjustments during the study; and records of interviews, workshops and observations. It also included reflecting on the process and providing feedback to the community of practice which ranged from the research participants, to critical friends (see Section 4.4.3) such as fellow students and researchers, SAQA and international researchers met at conferences. Preparations included designing questions and then pilot testing them, which I did in Case Study 1. During interviews in Case Study 1, I took notes of interviews but realised that I needed to record future interviews so that I could capture the details. I then transcribed each of the interviews held in each workshop and send these out to research participants for corrections. Fieldwork also involved observing the physical and material environment in both phases of the study. This was the exploratory phase. After this exploratory phase, a report was compiled for each case study (see Case Record Sections 2.5; 3.5 and 4.5) and sent out for comments. There was

a limitation in terms of the accessibility of the English report among farmers in Lesotho. The gist of the each report was captured in mirror data which was presented to research participants for feedback. This helped to overcome the challenge of language and assisted in obtaining the necessary feedback.

4.3.3.2 Phase 2: Expansive learning

The expansive learning phase of the study began with the holding of CL workshops. The time between the holding of the interviews and the CL workshops varied from five months in Case Study 3, to six months in Case Study 1, to ten months in Case Study 2. Each CL workshop shared the history of the sustainable agriculture practice locally; discussed the contradictions being encountered, chose which ones to work with and modelled at least one solution to at least one contradiction. Workshops lasted between 10 and 12 hours and each were run over two to four days. At the end of each workshop, research participants developed an action plan showing what they would do in connection with solutions that they had modelled.

During each CL workshop the researcher worked with an assistant who video-recorded proceedings and with whom he reflected on the proceedings of each day in order to plan for the following day. Within a week of completing a CL workshop, reports were sent for comment and often there none was received. During CL workshops, participants in Case Study 3 discussed in their local language and presentations were translated. This required considerable time and meant that we covered less ground than might have been possible. The use of local language however enabled farmers to engage with contradictions and model solutions in more enabling ways than would have been possible if they had worked in English. The limitation this created was that the researcher and his assistant could not engage much in the group discussions.

The second part of the expansive learning phase comprised of feedback engagements between the researcher and participants in each case study. In Case Studies 1 and 3, feedback workshops were conducted. In Case Study 3 a feedback meeting with the directors of RSDA and MADF were also held because they were unable to attend the workshop. In these two case studies, the feedback workshops were held about seven months after the CL workshops. In Case Study 2, the feedback sessions were conducted nearly 3 months after their CL workshop and this had implications on the progress made towards implementing the solution. The feedback in Case Study 2 involved three interviews. Throughout the research process, the methodological and theoretical reflections and insights generated in one case study informed the processes in subsequent case studies as all were concerned with change oriented workplace learning in sustainability practices. The table below (Table 4.1) summarises the phases.

Table 4.1: Two-phased case study design implemented in the study

Case Studies	Permaculture: Zimbabwe	Organic Farming: South Africa	Machobane Farming System: Lesotho
Phase 1 Exploring	Case Study 1 <ul style="list-style-type: none"> • Document analysis • Semi-structured individual and group interviews • Observation of farmer fields and gardens 	Case Study 2 <ul style="list-style-type: none"> • Document analysis • Semi-structured individual interviews • Observation of farmer fields and gardens 	Case Study 3 <ul style="list-style-type: none"> • Document analysis • Semi-structured individual and group interviews • Observation of farmer fields and gardens
<i>Data generated from the first phase fed into the second phase as „mirror data“.</i>			
Phase 2 Expansive	<ul style="list-style-type: none"> • Change Laboratory workshop • One-day feedback workshop • Process observation • Practise observation 	<ul style="list-style-type: none"> • Change Laboratory workshop • Three feedback interviews • Process observation • Practise observation 	<ul style="list-style-type: none"> • Change Laboratory workshop • One hour feedback meeting • Process observation • Practise observation
<i>Data generated from the second phase included some field level analysis with research participants as well as the modelling of solutions.</i>			

4.4 RESEARCH METHODS

Since the research work was exploratory, participatory and expansive within a case study design in which I sought insights into complex activity systems and sought to mediate the development of agency, I used methods that were qualitative. The methods are discussed below.

4.4.1 Semi-structured interviews

4.4.1.1 Individual interviews

I used semi-structured individual interviews to generate most of the primary data in the first phase of the research which was exploratory (see Table 4.1). I employed this method because it allowed me to obtain information from different sources and because it offered me the necessary flexibility to obtain, from each person, the most relevant information related to the research interest. I achieved this by developing an interview protocol for each „stakeholder“ group (see Appendix 3). Following appropriate ethical protocols (see Section 4.2.2.6), I then engaged each research participant in an informal conversation. The follow-up questions during the interviews were shaped by the research subjects through issues arising from the discussion – in what may be called a „transactional“ encounter. I was following the advice of Cicourel (1964, in Bloor and Wood, 2006) who say the central impulse of depth interviewing (also called semi-structured interviewing) lies in the sacrifice of reliability in pursuit of validity, meaning that such interviews sacrifice standardization and repeatability in order to access more fully the social meanings of the respondent’s world. Interviews are purposeful

conversations (Bloor and Wood, 2006) and involve the exchange of views between two or more people (Kvale, 1996 in Cohen, Manion & Morrison, 2007), and are therefore inter-subjective. Some of the interview techniques to ensure both depth and rigour included stating the purpose of the study, asking open-ended questions, pausing and immediately cross-checking important issues or suggestions that were being raised, and capturing of spoken interactions on tape with full transcriptions, as discussed below in more detail.

In the first phase, I conducted ten semi-structured individual interviews in South Africa, three in Lesotho and three in Zimbabwe. Each interview lasted between 45 minutes and two and half hours. I conducted two-part interviews with gate-keepers⁷ who were also key informants. They were people through whom I gained access to engage with research participants (see Section 4.3.2.1). In Zimbabwe, I took notes of the interviews and sent transcripts for improvement. In South Africa and Lesotho, I tape-recorded the interviews and transcribed them later in the evenings and after temporarily leaving the field. The advantage of tape recording was that I was able to retain an accurate interview record. I recorded after obtaining *the informed consent* of the research participants which was written in the case of Zimbabwe (see Appendix 5), where the gatekeeper did not accompany me, but verbal in the other two case studies. However, in South Africa this strategy nearly failed when I was robbed in my room at a guest house of my laptop, camera and cell phone. Luckily the tape recorder was not in the laptop bag, nor drawers that were ransacked because even my backup strategy of downloading onto the laptop every evening would not have helped.

4.4.1.2 Group interviews

I had originally planned to conduct focus group discussions in order to elicit the input of groups of interviewees, especially farmers. Upon further reflection before testing the tools I realised that focus group discussions would need participants who were familiar with the research process and object as they would have to facilitate the sessions. Group interviews on the other hand allowed me to use the interview schedule as well as follow up on new and emerging issues, while at the same time ensuring that we were moving towards addressing the research questions. A group interview is one in which several respondents are simultaneously asked questions by the researcher (Bloor & Wood, 2006). The method was efficient because it allowed me to elicit the input of several people in a short space of time. All in all, I held four group interviews in Lesotho – involving over 30 people and two groups in Zimbabwe involving seven people. As with individual semi-structured interviews, I took notes in Zimbabwe and sent transcripts for correction. While in Lesotho I tape-recorded and subsequently transcribed and sent the material for correction too. There were no group

⁷ Access in the field is usually through a *gatekeeper* who controls access to the setting (Bloor & Wood, 2006).

interviews in South Africa during the exploratory phase of the research as research participants chose how and with whom they were to be interviewed.

4.4.1.3 Data gathering using semi-structured interviews

In the SCOPE Permaculture-based case study, I held three individual semi-structured interviews with Permaculture facilitators who have been and are involved in facilitating the learning of Permaculture in Zimbabwe and two group interviews: one with three teachers and another with four farmers who promote and practise Permaculture. All six educators were male and among the four farmers, two were women. The teachers work at St Margaret School in rural Hwedza, while the farmers and one interviewee, a former teacher at the school live near the school. The remaining two interviewees were the SCOPE Materials Development Manager and a SCOPE founding member, both whom I met with in Harare. Individual interviews lasted between one and two and a half hours while group interviews took about two hours each. I took notes in the field and typed them up soon after when my memory was still fresh. I sent them to interviewees for checking and received some feedback, which made suggestions for extra detail but was mostly complimentary regarding the accuracy of what was recorded (see Case Record Section 2.3). I nevertheless decided that in future I would tape-record the interviews and that is how I recorded subsequent interviews in Case Studies 1 and 2. At this stage my framework of analysis was basically the activity system (see Appendix 4.1). The interviews were conducted in August 2008. It was only after this first case study that I developed a more comprehensive framework of analysis that captured the key dimensions of the research questions and theoretical frameworks. I coded the names in order to protect the anonymity of the research participants (see Case Record Section 2.3 for transcripts of selected interviews). The main language used during the interviews in Case Study 1 was English.

In the organic farming case study in South Africa (Case Study 2), I used semi-structured interviews for data collection from five farmers, one farm worker, three trainers, one organic produce marketer and one farmer who is also a trainer. Out of the ten research participants, three were women; none of the trainers interviewed were women. Interviews lasted between 45 minutes and two and a half hours each and I had to hold follow-up interviews with two research participants. Although all of them were individual interviews, the gate-keeper who took me around to meet research participants occasionally contributed to the conversations but I decided not to treat this as a group interview, because I had not invited his comments. The interviews were conducted in September 2008. For each interview, I used the analysis framework (see Appendix 4.2) to pull out essential information for the study purposes. Some of the interviews were not audible enough and I sent transcripts of the interviews to research participants so that they could validate the information. The response rate was low. I also coded the names of the interviewees for anonymity. Then I compiled a 30 page report

answering research questions and shared it with research participants (see Case Record Section 3.5) through the key informant. Responses were slow even after phoning to follow up, but ultimately only two people responded expressing surprise that they had said so much. Nine of the ten interviews were conducted in English, and one in Zulu and English, with the help of a translator (see Case Record Section 3.3 for transcripts of three selected interviews).

In the Machobane Farming System case study of Lesotho, I held three individual semi-structured interviews and one group interview with MFS promoters; one group interview with former MFS promoters; and two group interviews with farmers practising MFS in two neighbouring districts – Mophale’s Hoek and Mafeteng (see Case Record Section 4.3 for examples of transcripts). The combined number of farmer participants was 36; about two-thirds of them were women. Of the seven promoters, two were women. As mentioned above, the interviews were based on the work of two organisations promoting MFS in Lesotho: Rural Self-help Development Association (RSDA) and Machobane Agricultural Development Foundation (MADF). In each organisation, the director, trainers and farmers were interviewed. All the interviews, except one were conducted over a week at the beginning of October 2008. The last interview was conducted in March 2009 during a visit to conduct a Change Laboratory workshop and the issues raised were included in subsequent reports. Each interview lasted about an hour. For one of the promoters, the key informant, I held two interviews, one at the beginning and the other at the end of the visit. While we conversed in English with the seven MFS promoters, the interviews with farmers were translated from Sesotho to English and back.

The number of people interviewed in each case study varied partly because of who was available to be interviewed and partly because the gatekeepers suggested who I could talk to. Time was also a determining factor, as I had about a week assigned for data gathering in each case study in the initial round of interviews. It was easier to conduct more interviews in Durban because interviewees lived relatively near each other. I interviewed the highest number of people in Lesotho because the farmer groups, which were already organised, attended in large numbers. The other determining factor as to how far I went with interviewing was concerned with whether I felt that there appeared to be sufficient information to work with on the research topic. The translations also posed potential validity threats but the connectedness of the interviews and the follow-up questions minimised such threats. This is because the translators were locals who were trained in agriculture and extension and had a good grasp of the subject and this helped to mitigate language threats to validity. The relatively low response rates to both transcribed interviews and reports in each case study potentially threatened the validity of the findings and I addressed this through presenting „mirror data“ in the Change Laboratory workshops that followed (see Sections 7.2-7.4) and the changes were generally concerned with emphasis. For example, in Zimbabwe the

marketing issue was underlined during the workshop; in Lesotho the framing of lack of government assistance was changed; and in South Africa the issue of inclusion of lay knowledge assumed more importance. Women participation in Zimbabwe and South Africa was low but high in Lesotho even though in all three countries, there are more women farmers than men. What was striking (and not necessarily representative) was that there was a very small proportion of women among the sustainable agriculture facilitators – none in Zimbabwe and South Africa, and only two in Lesotho. The interviews are summarised in Table 4.6 at the end of Section 4.4.

4.3.2 Document analysis

Documented literature often carries a history, and therefore culture and context. Given that I was using critical realism, an ontological theory that values the presence of the past and absent (see Section 3.2) in the present as well as an epistemological theory with a strong historical and cultural and context orientation (see Section 3.4), document analysis formed an important part of the data gathering methods. The other advantage of document analysis is that documents are not affected by the nature of the enquiry and are therefore neither obstructive nor reactive. The documents that I used in the study included books, course outlines and programmes, case specific articles and stories, pictures, brochures, annual plans and reports. A full list of documents analysed for each case study is provided in the table below (Table 4.2). In reading the documents, I tried to be aware of and critical about the circumstances in which they may have been written, a practice which is consistent with good research.

Table 4.2: List of documents analysed in the study

Case study	Titles of documents
Case Study 1: Schools and Permaculture Programme, Zimbabwe	<ol style="list-style-type: none"> 1. GardenAfrica. (2009). <i>Livelihood security in a rapidly changing environment: Training for trade in organic conservation agriculture, Zimbabwe</i>. Unpublished. London: GardenAfrica. 2. Makoni, K. (2000). <i>Schools and Colleges Permaculture (SCOPE): SCOPE programme evaluation report</i>. Unpublished: Harare. 3. Makoni, K. (2003). <i>SCOPE programme phase 4: Mid-term evaluation report</i>. Unpublished. Harare 4. Mollison, B. (1991). <i>Introduction to Permaculture</i>. Tyalgum: Tagari Publications. 5. Mtetwa, D. (2004 May). <i>Schools and Colleges Permaculture Programme (SCOPE) at ten: Evaluation report</i>. Unpublished. Harare: SCOPE. 6. Mtetwa, D. (2006). <i>An Evaluation of SCOPE</i>. Unpublished. Harare: SCOPE. 7. Mukute, M., & Marange, T. (2008). <i>Permaculture Training Manual</i>. Pretoria: Ukuvuna. 8. Nyika, M.W. (2001). <i>Permaculture as an aspect of environmental learning: an investigation into secondary school communities in Zimbabwe</i>. Unpublished master's thesis, Rhodes University Grahamstown. 9. Nyika, M.W. (2002). <i>The SCOPE programme</i>. <i>Ground Up 1(10)</i>, 37-38 10. PELUM. (1995). <i>A process for land use design</i>. Unpublished. Harare: PELUM. 11. <i>Regional SCOPE newsletters – in 2009 (2)</i>

	<ol style="list-style-type: none"> 12. ReSCOPE. (2009). Annual report for year ended February 2009. Unpublished. Regional SCOPE: Blantyre. 13. Savory, A. (1990). <i>Holistic resource management</i>. Albuquerque: Gilmour Publishing. 14. SCOPE newsletters – from 2001 to 2006 (6) 15. SCOPE website: http://www.rescopeprogramme.org 16. SCOPE. (2004). Learner's Activity Book. Harare: The College Press. 17. Tsiko, S. (2000). Take climate change to the villagers. <i>The Herald</i>, March 21. 18. Verkerk, R. (2001). Farmer's friends: recognition and conservation of natural enemies of vegetable pests – a field guide for extension staff and trainers in Zimbabwe. London: Biology Department, Imperial College of Science, Technology and Medicine. 19. Wilson, J. (1999). <i>Mainstreaming Sustainable Agriculture</i>. PELUM Association. Harare. Zimbabwe
<p>Case Study 2: Isidore Organic Farmers and Marketers, South Africa</p>	<ol style="list-style-type: none"> 1. Auerbach, R. (2009a). Report on International Agribusiness Forum. Unpublished. Cape Town: PELUM & South African Organic Sector Organisation. 2. Auerbach, R. (2009b). Review of the organic value chain report to FRIDGE-DTI by Institute of Natural Resources (INR). Unpublished. Durban: Rainman Landcare Foundation. 3. Biowatch. (2009). Victory for Biowatch in landmark legal case. Press statement Retrieved from June 10, 2009 from www.biowatch.org.za 4. Chola, M. (2006). Organic Farming: Is it the answer to smallholder agriculture? (p.11). <i>Ground Up 2(16)</i>. 5. Earth Mother Organic website www.earthmotherorganic.org.za 6. Heckman, J. (2007). A history of organic farming: transitions from Sir Albert Howard's war in the soil to USDA national organic programme http://www.westonaprice.org/farming/history-organic-farming.html Retrieved April 24, 2009. 7. IFOAM & FiBL. (2006). <i>The World of Organic Agriculture. Statistics and Emerging Trends 2006</i> (pp. 27–35). Bonn; International Federation of Organic Agriculture Movements (IFOAM), Bonn & Research Institute of Organic Agriculture FiBL. 8. IFOAM homepage. The PGS Document. Retrieved November 18, 2009, from www.ifoam.org/about_ifoam/standards/pgs.html 9. IFOAM. (2003). <i>Organic and Like-Minded Movements in Africa</i> (pp.102–108). Bonn: International Federation of Organic Agriculture Movements (IFOAM). 10. IFOAM. (2005). <i>The IFOAM norms: International Federation of Organic Agriculture Movement</i>. Retrieved July 21, 2008, from http://www.ifoam.org 11. IFOAM. (2009). Organic farmers from around the globe observe World Food Security Summit. Retrieved November 16, 2009, from www.ifoam.org 12. Institute of Natural Resources. (2008). Executive summary: Study to develop value chain strategy for sustainable development and growth of organic agriculture. Pretoria: Trade and Commerce Chamber, Fund for Research into Industrial Development, Growth and Equity (FRIDGE). 13. Muller, B. (2008). Introduction to organics: Isidore Organic Farm. Unpublished. Durban: Isidore. 14. Organics South Africa website: http://www.oaasa.co.za 15. Saruchera, M. (2006). Organic farming: the hope for South African smallholder farming? (pp. 8-10). <i>Ground Up 2(16)</i>. 16. Wilson, J. (2002). <i>Organic cotton country report: Zimbabwe</i>. London: Pesticide Action Network.
<p>Case Study 3: Machobane Farming System, Lesotho</p>	<ol style="list-style-type: none"> 1. Abbot, J. (2002). Lesotho's food crisis: balancing humanitarian and development responses to food shocks. Retrieved January 6, 2009 from www.sarpn.org.za/documents/d0000153/index.php 2. Boehm, C. (2002). The social life of fields: Labour markets and the agrarian change in Lesotho. Paper presented at the Conference Beyond Territory and Scarcity at the University of Copenhagen, Denmark. 3. Chakela, Q.K. (Ed.). (1999). <i>State of the Environment in Lesotho 1997</i>.

	<p>National Environment Secretariat, Ministry of Environment, Gender and Youth Affairs: Maseru.</p> <ol style="list-style-type: none"> 4. Grandin, F. (2001). The Machobane farming system: An overview and analysis of an agricultural innovation that has affected development amongst small-scale farmers in Lesotho. Unpublished. Harare: PELUM. 5. Harrison, P. (1989). <i>The greening of Lesotho: A report on conservation for increased production</i>. London: Oak Foundation. 6. Helvetas. (n.d.). Machobane Farming System. Helvetas: Maseru. Unpublished. 7. Hogstrom, U. & Magnusson, L. (1991). Soil investigation in Maphutseng Valley, SW Lesotho, for location of agricultural experiment plots: pilot study for the FISC Project. <i>Working Paper 162</i>. Swedish University of Agricultural Sciences: Uppsala. 8. IIRR. (1998). Sustainable agriculture extension manual for eastern and southern Africa. Nairobi: IIRR. 9. Kynoch, G. & Ulicki, T. (1999). The socio-economic impacts of stock thefts in southern Lesotho. Unpublished. 10. Leboela, T. & Turner, S.D. (2003). The voice of the people: report on community consultations for the National Vision and the Poverty Reduction Strategy Paper. Unpublished. Maseru: Ministry of Finance and Development Planning. 11. Machobane, J.J. & Berold, R. (2003). <i>Drive out hunger: The story of JJ Machobane of Lesotho</i>. Bellevue: Jacana Books. 12. MADF. (n.d.) Machobane Farming System. MADF: Maseru. 13. MADF. (n.d.) Home vegetable production using the Machobane farming system techniques. MADF: Maseru. Unpublished. 14. Matsipa, P.H. (2008). Lesotho country report: A highlight on sufficiency economy concept in Lesotho. Ministry of Forestry and Land Reclamation. Retrieved, January 7, 2009 from http://www.eto.ku.ac.th/s-e/SEgroup2/Country_Report/Lesotho.pdf 15. Moeti, L., Mphale, M, Makaoe, M. & Tango International Consultancy. (2003). <i>Lesotho emergency food security assessment report December 2002</i>. Maseru: Lesotho Vulnerability Assessment Committee. 16. Mohapeloa, S.P. (2002). Machobane Farming System: Towards food security and poverty alleviation in Lesotho. Retrieved January 6, 2009 from www.ifad.org/ngo/events/pf/reports/session3.pdf 17. Mosenene, L. (1999). Soil-water and conservation tillage practices in Lesotho: Experiences of SWACAP. In Kaumbutho, P.G. & Simalenga, T.E. (Eds.). <i>Conservation tillage with animal traction: A resource book of the Animal Traction Network for Eastern and Southern Africa (ATNESA)</i>. Harare: ATNESA. 18. Mosenene, L. (2000). Lesotho farmer with initiative: Machobane and his farming system. Paper presented at the conference on Promoting farmer innovation, February 2000, Mekelle, Tigray, Ethiopia. 19. Mosenene, L. (2003). The future of the Machobane Farming System. In Machobane, J.J., & Berold, R. <i>Drive out hunger: The story of JJ Machobane of Lesotho</i>. Bellevue: Jacana Books. 20. Pantanali, R. (1996). <i>Lesotho: A note in the Machobane system</i>. Rome: FAO. 21. Pfothenauer, L. (1987). Profile James Jacob Machobane (pp.4-5). <i>Molepe The in-flight magazine of Lesotho Airways I(2)</i>. 22. Robertson, A.F. (1994). Popular scientist: James Jacob and Machobane mantsa tlala. <i>African Affairs Oxford Journal 93</i>, 99-121. 23. RSDA. (n.d.). Machobane Farming System. RSDA: Maseru. 24. Sechaba Consultants. (2000). Poverty and livelihoods in Lesotho. Unpublished. Maseru: Sechaba Consultants. 25. Turner, S.D. (2003). <i>Southern Africa food crisis: Lesotho literature review</i>. Johannesburg: CARE.
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In the box below (Box 4.1), I illustrate the manner in which I worked with documents but drawing notes from them and subsequently using some of the notes in writing reports as well as this thesis. Data from document analysis was used to both augment and triangulate data from other sources: interviews and observations.

Box 4.1: An example of document analysis in the study

Boehm, C. (2002). The social life of fields: Labour markets and the agrarian change in Lesotho. Paper presented at the Conference Beyond Territory and Scarcity at the University of Copenhagen, Denmark.

1. The process of de-agrarianisation of Lesotho is linked to its integration into the regional and global economic systems.
2. The agrarian system of Lesotho was and is supported from the cash inflows from the BaSotho working in the mines in South Africa. The loss of jobs in South Africa has a negative effect on the agriculture in Lesotho, even though on the surface it appears that there will be more men available to do agriculture.
3. The proportion of landless people in Lesotho is about 40 %.
4. Boehm cites Long and Villareal (1994) and Richards (1993) as stressing “the importance of social relation and networks in the composition of farming agency”. He refers to Richard (1993) as rejecting “the concept of a comprehensive body of indigenous knowledge and argues that farming strategies are the product of improvisational skills, resource negotiations and technical experiments” (Boehm, 2002, p. 3).
5. Boehm (2002, p. 3) notes that the life of farmers in Lesotho is characterised by risk and uncertainty, with three main kinds of uncertainties. Livelihood uncertainty which is determined by international labour and capital markets; ecological uncertainty which is concerned with variation and dis-equilibrium in ecological systems; and knowledge uncertainty, which is concerned with knowledge being always “situated, contested, plural and partial”.
6. During the second half of the 19th century the Basotho were exporters of grain to the Kimberley mines in South Africa. In 1873, they exported 100,000 bags of grain alongside other agricultural produce such as mohair and wool (Ferguson, 1990). One of the most important reasons for the decline in agricultural production in Lesotho was the employment of Basotho men in South Africa mines, leading to the completion in the 1930s of the transition of Lesotho from a “granary to a labour reserve” (Murray, 1981). The other reasons for decline of agriculture are soil erosion, population pressure, maize mono-cropping, pests and the loss of the West of the Caledon River following the Basotho-Boer wars of 1858 and 1865 (Gill, 1993).
7. The Basotho invest little in agriculture because it has lower returns compared to other economic activities such as working in the mines. In addition, the food prices are relatively low compared to the production costs (Boehm, undated). In addition, the attitude of rural people in Lesotho is that farming is a domestic and female chore rather than a real profession (This resonates with the low status of agriculture in South Africa). Men’s ambitions lie outside agriculture, having being forced off land by wars, pests and droughts. In the absence of a pension scheme (in the mines) farming remains essential as a retirement strategy (This could explain why ESAFF leaders from Lesotho are older compared to those from other parts of east and southern Africa).
8. Farming outputs are generally low so that wages are essential.
9. Relational agency in Lesotho’s agricultural practices is brought about by the need to bring together people with different resources which are essential for successful farming. The primary relations appear to be those between people with fields but no money and those with money and no fields. Boehm notes that very few people control all the means of production.
10. In Lesotho sharecropping is used in two senses *lihalefote* or *seahlolo*. *Lihalefore* is derived from Afrikaans and literary means half-half and is a more businesslike entrepreneurial contract and has its roots in the Basotho-Boer cooperation in the Orange Free States. *Seahlolo* is a traditional type of Basotho communitarianism, redistribution and social welfare. “Because households typically have different kinds of farming implements available during the different stages of their life cycle,

share-cropping is often intergenerational” (Boehm, 2002, p. 9). Sharecropping here is seen as a necessity rather than as an ideal.

11. Generally, households in rural Lesotho follow a similar pattern of accumulation, growth, decline and impoverishment, which results in people moving in and out of poverty and or wealth (Boehm, 2002, p. 9). These are largely determined by wage labour and access to land (but do not take adequate account of women).
12. “Ploughing, hoeing, and harvesting in high altitude environment with erratic rainfalls, frequent hailstorms, early frosts and recurring droughts has to be timed in a precise and flexible manner” (Boehm, 2002, p. 10).
13. Boehm notes that the growth of unemployment of the Basotho men in mines has resulted in less cash being available to buy implements, seed and fertiliser, and therefore lack of money to link to the fields, which is undermining not only sharecropping but also the „traditional“ four stages of development (accumulation, growth, decline and impoverishment).
14. The risk associated with investing money in agriculture when there could be a drought or frost or hailstorm that will destroy the crop discourages farming in Lesotho.

4.3.4 Observation

Observation helped me to access what the participants do, rather than what they say they do (Bloor & Wood, 2006). It provides an opportunity for one to look directly at what is taking place *in situ* (Cohen et al., 2007), which was consistent with the practices focus of the research. This happened especially in terms of observing the design and to an extent, the input strategies that farmers employed in their homesteads, gardens and fields. I took pictures to capture some of the observations made during the research process and others outside the workshop to record aspects of sustainable agricultural practice (Figure 4.2). Observations of expansive learning processes happened during the CL workshops and shaped how subsequent sessions of each workshop were structured. The observations were captured by video which I re-played several times for analysis.



Figure 4.2: Observation and picture-taking for data gathering

The pictures show that there are poor soils in Mafeteng District, Lesotho. An MADF researcher on MFS is experimenting with new ways of generating organic manure using locally available materials to replace scarce ash recommended in MFS. An employee is turning the compost. One hundred and eighty 25 kg bags of compost have been produced for sale to farmers. But RSDA another NGO promoting MFS did not know about the experiment until we held a feedback meeting at MADF. Yet RSDA had a dairy project that could feed into the experiment.

4.3.3 Focus group discussions

In this study focus group discussions were used for mediating discussions among research participants during CL workshops discussed below. Between three and eight people in a CL workshop would meet first to discuss their history in relation to a sustainable agriculture practice, revealing the main trends, changes and their causes; second to analyze selected contradictions from their activity systems; and third to co-construct model solutions to address contradictions. Relatively homogenous groups – such as farmers or facilitators – discussed their histories and analysed their contradictions but in modelling solutions, groups were mixed in order to take advantage of the distributed cognitions from different sources: farmers, marketers, extension workers, environmental educators, and sustainable agriculture facilitators.

4.3.4 Change laboratory workshops

The method that I used for data generation and also part of the data analysis in the interventionist and second phase of the research was change laboratory workshops, a method developed by Engeström based on Vygotsky's work on double stimulation (see Section 3.6.7). Moldashl and Brödner (2002, in Pihlaja 2005, p. 190) note that there are three models of intervention: the expertocratic which assumes that scientific knowledge is superior to practitioner's knowledge; the proceduralistic model which assumes that the knowledge is already available in the organisation and only needs to be mobilised; and the reflexive model which transcends the two and stimulates re-negotiation and self-reflection among both organisational members and external experts. I worked with the reflexive design, which also resonates with the thinking behind CL and is consistent with case study design as argued by Lotz-Sisitka and Raven (2004, p. 80) "In all of the cases reported above, the researchers employed a mix of pre-determined methods ... but as the case study deepened, and the data were generated, most allowed the research design to emerge". Similarly Janse van Rensburg (1995) concluded that an important feature of emergent research designs was methodological reflexivity (see Section 4.8). Wals and van der Leij (2007) also underlined the importance of reflexivity in social learning processes. Ahonen and Virkkunen (2001) noted that CL workshops are both a space and a process.

Ala-Laurinaho and Koli (2007, p. 28) noted that "the spirit of the Change [Laboratory] Workshop is to enhance the building of shared views of the changing object and activity system, in order to develop new practices, tools and models". The method, which is based on double stimulation, supports the CHAT and critical realism objective of research that seeks to transform and improve the conditions of research participants. As Engeström (2007, p. 363) notes, "Double stimulation, is focused on making subjects masters of their own lives" (see Section 3.6.7). Ala-Laurinaho and Koli (2007, p. 26) point out that CL workshops are a place where „disturbances“ of daily work processes are materials for analysis and interpretation as

well as seeds for defining the zone of proximal development of the activity. When contradictions are identified, two things should be done: their root causes need to be traced and their consequences examined in other parts of the system (see Sections 1.7.1; 2.6; 3.2 and 3.4). The CL workshop process resonates with the reasons why Wals (2007) developed a tool to develop and monitor social learning. Deframing, which is concerned with articulating and challenging each other and revealing conflicting frames (ibid., p. 41) can be associated with the process of surfacing and analysing contradictions in a CL workshop. Reframing, which follows deframing and is concerned with the co-creation and joint reconstruction of ideas (ibid.), can be linked to the solution modelling process in CL workshops (see Section 3.6.5).

The other names for double stimulation are: experimental-genetic method, instrumental method and historical-genetic method (Engeström, 2007, p. 364). In CL workshops, the subject is put in a structured environment where the problem exists and the subject is provided with active guidance towards the construction of new means to develop a solution to a problem. The first stimulus is a problem that the subject cannot solve alone with the help of previously learned concepts and methods while the second stimulus is a neutral tool that the subject can make into an instrument for organising the problematic situation to develop a solution (Virkkunen & Schaupp, 2008). Through use of the cultural artefact as a tool for action, the subject gets engaged first in the process of remediation and later in the process of formative intervention (ibid., 2008). For each of the three case studies, I ran a five-session CL workshop over four days in two case studies and over two in one, which started off by sharing the concepts and then providing the double stimulation of the contradictions raised in the first phase of the research through analysis using the CHAT model, which acted as the neutral tool. In working with the CL workshops, the research participants used three main data types: mirror data which captured contradictions and past innovations; the neutral tool; and a third sheet where new ideas were captured. Figure 4.4 below shows the sitting arrangements of research participants during plenary sessions.



Figure 4.3: A typical sitting arrangement in a CL workshop

We also moved through the three layers of time in analysing things and developing solutions: looking at the past, present and future as recommended by Engeström (2007, p. 374-375). In each succeeding session, we viewed excerpts of the previous session for reflection which I had selected based on what I considered to be important things emerging from the discussions. The table below (Table 4.3) shows how I planned the CL workshops. I decided not to complete all the stages in one day because I felt it was important to have enough time for the research participants to internalise the process and reflect on the issues. I also needed time to watch and digest the video film on the CL workshops to be able to bring out further mirror data for subsequent workshops during the four-day period. I used the remaining time to follow up on specific issues with some individuals.

Table 4.3: Typical planned outline of CL workshops as used in the study

Thrust	Main activities
Session 1: Orientation	<ul style="list-style-type: none"> • Welcome and introductions • Presentation of workshop objectives and programme • History of the Machobane Farming System in our organisation or area • Presentation of the concept of activity system as a unit of analysis • Group work to develop an activity system from the perspectives of farmers, and facilitators • Presentation and discussion of the activity systems • Closing remarks
Session 2: Identifying contradictions	<ul style="list-style-type: none"> • Reflections on Day 1 • Sharing insights into contradictions • Contradiction analysis and prioritisation (deframing) • Presentation of results of group discussions • Closing remarks
Session 3: Questioning and	<ul style="list-style-type: none"> • Reflections on the previous two days • Researcher presents „mirror“ data on problems he identified in August 2008

analysing contradictions, preparing solutions	<ul style="list-style-type: none"> • Researcher presents the expansive learning system to show how the contradictions can be dealt with and links activity system to expansive learning • Solution modelling. • Closing remarks
Session 4: Sharing and examining solutions	<ul style="list-style-type: none"> • Reflect on the previous three days • Groups present model solutions (reframing) • Critique each others' model solutions • Planning the way forward⁸ • Workshop evaluation • Closing the workshop

Long (2001 in Engeström, 2008, p. 19) noted that “crucial to understanding processes of intervention is the need to identify and come to grips with the strategies that local actors devise for dealing with their new interveners so that they might appropriate, manipulate, subvert or dismember particular interventions”. This is a particularly pertinent point because I worked with the research participants not just to surface contradictions but also so that even after my departure from the field, they would be able to continue working reflexively together. The interventions involved negotiation and responding to local issues, tapping into local resources as well as providing some guidance through supplying mirror data and a systemic view of the learning activity to assist participants and more importantly, a participatory learning and action methodology. A Change Laboratory (CL) Workshop is a joint journey through the phases of expansive learning. Engeström⁹ (2003, p. 2) noted that the “change laboratory method focuses on historically emerging tensions and contradictions in the activity system” and the goal of the method is “to expand the understanding of practitioner’s activity through experimenting and reflecting” as well as “promote people’s possibilities to utilise their multiple understandings and identities”. The zone of proximal development in this method is the collective, not the individual (see Section 3.6.1).

Senteni (in Engeström, 1987) also makes the important distinction of three layers of learning that can occur through and during CL workshops:

- Single-loop learning which occurs when errors are detected and corrected in a way that does not touch on the policies and goals. This kind of learning takes place in the individual when their competence is improved but does not alter the fundamental nature of the group’s activities;
- Double-loop learning when, in addition to the above kind of learning, the group also questions and addresses existing norms, procedures, policies and objectives of the group or institution. In this process of learning, the group makes sense of its

⁸ In the final writing up, I decided to separate the planning workshop from the sharing and examination of solutions because it was an exercise with a different (but related) purpose.

⁹ This paper was written by R. Engeström unlike the rest of the Engeström papers.

environment in ways that broaden the range of objects that it can pursue and resources available to pursue them; and

- Deutero-loop learning which occurs when addressing the group's basic assumptions and core beliefs (see Section 3.6.8).

In the long term, it is double and deutero-loop learning levels that become expansive learning because they expand the group or organisation's capacity. This resonates with the following observations made by Warmington et al. (2005) who also identified three levels of learning, based on the work of Bateson:

- Level 1: Generalizations from basic experiences leading to understanding suitable behaviours in specific contexts and results in conditioning.
- Level 2: Learning through the extraction/acquisition of the implicit and deep seated rules (e.g. the hidden curriculum).
- Level 3: Learning through radical questioning of the behaviour and content, offering opportunities for reconceptualization, change and development which leads to construction of a wider alternative context.

In theories of environmental education and education for sustainable development, similar levels of learning have been identified by Wals (see Section 2.6) and Glasser (2007) (see Section 3.4), with the third and highest level being co-learning. In the field of agricultural extension and facilitation, Scoones et al. (2008) developed a similar four-stage classification from technology transfer to people-centred learning and innovation (see Section 2.4, Table 2.2). What is evident from all of the above classifications is that need for reflexivity begins at level 2 and that level 3 deals with the triple factors of dialectics, agency and reflexivity, which are central to this study.

Engeström further developed five principles to guide the implementation of CLs, which are:

- a. An interplay between the close embeddedness in work and reflexive distance taking;
- b. Practical problem solving and the construction of a future vision have to be combined which results in new kind of dialogue between solving specific problems and implementing future visions;
- c. Multiple change processes with different developmental rhythms need to be managed;
- d. Methods and tools of everyday work and the developmental activity have to be made to support each other in a manner which creates a new dialectic between current practices and its development is needed; and
- e. A new kind of interaction between innovation and tradition, where existing structures and resources are used to take up new challenges and develop new products and services (Virkkunen, Engeström, Pihlaja and Helle, 1997 in Pihlaja, 2005, p. 187-188)

These principles were helpful in assisting research participants to both imagine and concretise, to link their current work and their future vision. In two of the workshops more than one solution was developed and they were implemented at the same time. An attempt was made to use existing political structures in Zimbabwe in order to achieve the desired end and this was successfully achieved (see Section 7.2).

During CL workshops, we worked with Seppänen’s model of problem solving in stages which allows for engaging with both the visible and invisible dimensions of a problematic situation (Figure 4.4).

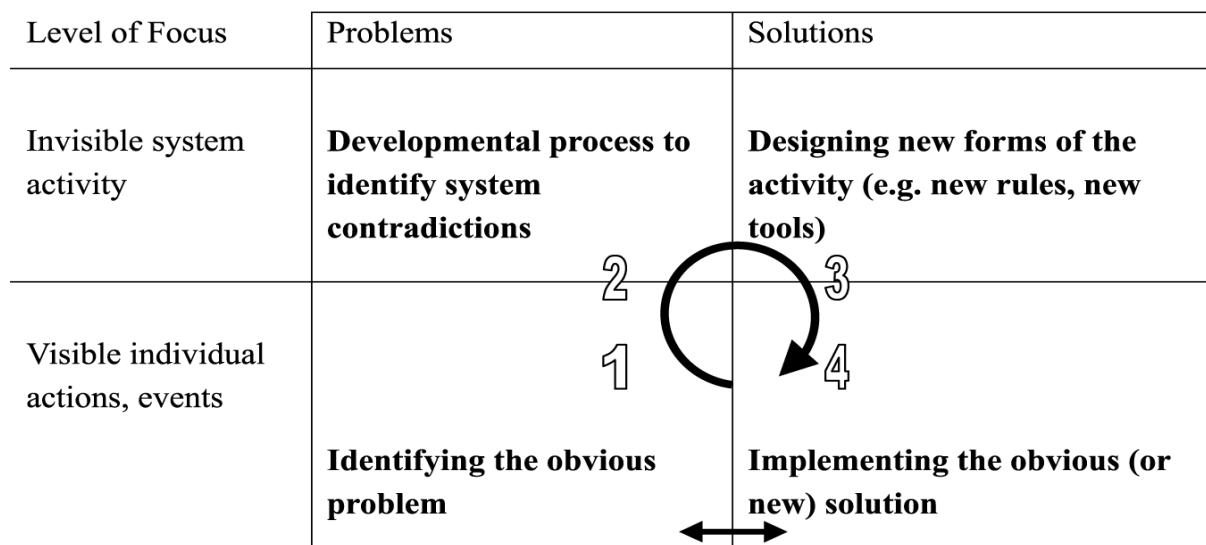


Figure 4.4: Stepwise problem solving in CHAT

Source: Seppänen (2002) in Hill (2005), p. 364

This research project employed double stimulation during Change Laboratory (CL) workshops, with „mirror“ data providing the first stimulus and the expansive learning process providing the second. Altogether, 11 model solutions were developed during four-session CL workshops in the three case studies (see Sections 7.2-7.4). Details of CL workshops are captured in the table below (Table 4.4).

Table 4.4: How I worked with the Change Laboratory method

Session	Focus/thrust	Case Details
One	Orientation to the workshop and tools and doing a historical timeline of the practice in the area under study.	In SCOPE this involved sharing the activity systems and the expansive learning cycle. It also involved the telling of their different histories with Permaculture (see Section 7.2).
		In the MFS case study this involved talking about the expansive learning cycle. It also involved the telling of their different histories with MFS. The most important improvement was in the strong representation of government extension workers (see Section 7.3).
		In the Organic Farming case study this involved discussing both the activity system and the expansive learning cycle and sharing biographies of engagement with organic farming. The most important improvement was in the inclusion of entrepreneurs (but there was no government extension worker representation because the sector is still disorganised and wanted to „put its house in order first“ unlike in the other two case studies) (see Section 7.4).
Two	Identification of contradictions by participants and presentation of mirror data (contradictions) by researcher;	In SCOPE contradictions were identified in three groups of teachers as facilitators of Permaculture, pupils and farmers. The government agriculture extension officer worked with the group of farmers. The researcher presented learning and developmental issues gathered from initial research. The workshop participants then chose ranked contradictions and worked on five (see Case Record Section 2.6) but only the two main ones are discussed (see Section 7.2.4).
		In MFS, contradictions were identified in two mixed groups. The researcher later presented learning and development contradictions identified through initial research. The participants ranked contradictions on which to work. They settled to work on five contradictions in two groups (see Case Record Section 4.6) but only the main one is discussed (see Section 7.3.3).
		In Organic farming, contradictions were identified in the plenary but also from individual reflections and biographies. The researcher later presented mirror data and the contradictions were synthesized in the workshop before ranking was done. Three contradictions were selected but the workshop worked on one (see Case Record Section 4.6). The most important improvement was in adding the development of a shared vision at this stage ahead of analysing contradictions (see Section 7.4.2).
Three	Analysing contradictions	In SCOPE contradictions were analysed in mixed groups of Permaculture facilitators, pupils and farmers to take advantage of distributed cognition. They were analysed in terms of history, causes and effects (see Section 7.2.3).
		In MFS contradictions were analysed in mixed groups of MFS facilitators, farmers and government extension worker to take advantage of distributed cognition. They were analysed in terms of history, causes and effects (see Section 7.3.3).
		In the organic farming case study the contradiction was analysed in the plenary session in terms of manifestation of the contradiction; evolution and causes. Organic farmers, trainers and entrepreneurs used their distributed knowledge on the analysis (see Section 7.4.3).
Four	Developing model solutions (and critiquing them)	In SCOPE participants broke into two groups, and each developed solutions to three contradictions. Each had to write a letter summarising the causes, effects and model solution being suggested. The plenary presentations served as the first stage of critiquing the adequacy and internal coherence of the model solutions. This thesis reports on two of the solutions (see Section 7.2.4).
		In MFS participants remained in the two mixed groups to develop model solutions, working on three each, one of which was covered by

		<p>both. These presentations served as the initial test of the model solutions. This thesis reports on two of the model solutions (see Section 7.3.4).</p> <p>In the Organic Farming case study the solution was developed in the plenary first and then in two mixed groups. The two groups suggested significantly different configurations of the solution. Upon deliberation in the plenary one of the models was agreed upon (to start a forum on a clean slate, rather than as an extension of an existing organisation). The plenary then proceeded to characterise the composition of such forum. Potential implementation hurdles were identified. The most important improvement was in focusing on one contradiction (see Section 7.4.5).</p>
Five	Way forward	<p>One of the most important considerations of the workshop was concerned with how the learning from the research process could be carried forward. Each workshop therefore ended with such a plan (see Sections 7.2.5; 7.3.5 and 7.4.5.3).</p>
Six	Feedback workshop	<p>In SCOPE the feedback workshop took place seven months after the CL workshop which modelled solutions. The workshop was attended by two farmers (the other farmers were attending a funeral), four pupils and four Permaculture facilitators (teachers). I worked with a research assistant who video-recorded all proceedings. Research participants reported on the progress they had made in implementing their modelled solutions. I reported on what was emerging from the research, thanked them for participating in the research and bid them farewell as I was „leaving the field“. The workshop lasted 2.5 hours.</p> <p>In Isidore Organic Farming the planned feedback workshop did not take place. However, three feedback meetings were held with four research participants. The feedback workshop could not be held by having participants together because they were going to hold a meeting the following week and also because the gatekeeper felt that there was not enough to share at such a meeting.</p> <p>In MFS the feedback workshop took place eight months after the CL workshop which modelled solutions. The workshop was attended by five farmers and two MFS facilitators and lasted about two hours. It was augmented by a feedback meeting between the researcher and two leaders of the MFS promoting organisation that lasted an hour. Research participants reported progress with regard to securing a strategic plot in the Mafeteng District to demonstrate MFS. Leaders of the MFS promoting organisation indicated their intentions for closer collaboration. In both cases I presented a summary of key findings and recommendations which were discussed before I thanked them and bid them farewell.</p>

4.4 ENSURING DATA QUALITY (VALIDITY)

Validity may be seen as the “correctness or credibility of a description, conclusion, explanation, interpretation or any other sort of an account” (Maxwell, 2005, p. 106). The two main threats to validity in qualitative research are researcher bias and participants reactivity (ibid.). The researcher’s bias may influence the research to select only certain types of data. He suggested that this can be overcome by the researcher’s declaration of personal values and beliefs that he/she brings into the study. In the study I tried to make it clear that I believed in the potential of sustainable agriculture and that the marginalised peoples and their knowledges ought to be recognised as well, without taking a naïve or romanticised position (see Chapters 1 and 2). In the CL workshops held in Case Study 1 and Case Study 3, conventional agricultural extension workers were deliberately invited and actively

participated in analysing solutions and modelling solutions. I used dialectics, reflexivity and the search for causal mechanisms to also limit the potential temptation to not see the other side. Working with boundary crossing networked learning systems also helped to mitigate potential biases.

There were several ways in which the research process minimised participants' reactivity. This included intensive, long term involvement; rich data obtained through transcribing and employing rigour in its interpretation (Chapters 5, 6 and 7); member checking triangulation by source and method, and especially by using documents analysis (as documents are not reactive to a study done after their compilation). Nevertheless, I believe that a longer stay involving even more stakeholder groups in the research would have yielded even more rigorous research results, especially given that expansive learning processes can take up to two to three years to complete a full cycle (Engeström, 2005). Engeström (2007, p. 372) also pointed out that "an expansive learning cycle takes ten to twelve weekly sessions and one or two follow-up sessions after a few months. One cycle leads to the next one and within cycles there are smaller cycles of problem solving and learning". Similarly, Bodrožić, (2008, p. 31) made a proposal for "expansive methodology, consisting of a dialectical „miniature“ and an expansive „miniature“ cycle". These miniature cycles are characterised by being local, with the expansive dimension focusing on delineation of local cases; analysis of local activities and formulation of zones of proximal development; developing new models for the activity; application of the new models and evaluation of the use of the model at local level. Case Study 1, which focused on the local activity systems of the St Margaret School and that of farmers in the community, was local and followed each of the steps stated in the miniature expansive cycle. In order for the process to meet the broader expansive methodology as discussed by Bodrožić (2008), it needed to have fed into the Schools and Colleges Permaculture Programme as a whole and that could happen if recommendations (see Section 10.2) are implemented, reviewed and consolidated. In this research process, the length and local complexity of expansive learning processes emerged as the research progressed. While I was not able to participate fully in all the ongoing local interactions, I was able to gain insights into the expansive learning processes through rigorous documentation and analysis, which was an important strategy to maintain validity and trustworthiness and to a limited extent I was therefore able to provide a rigorous account despite a lack of „full process“ data. Details of validation strategies are discussed below.

4.4.1 Triangulation

I used triangulation in order to ensure the trustworthiness of the research findings by using different data generating methods: observations of participant and agricultural practices; document analysis; individual and group interviews; and focus group discussions in Change Laboratory workshops. Triangulation was also achieved through obtaining information from

different sources: sustainable agriculture farmers, facilitators, organic marketers and conventional agriculture extension workers. During CL workshops, there were often additional sources of information such as environmental educators and NGO leaders who had not taken part in the initial interviewing process. Their feedback on findings and analyses also served to triangulate data.

4.4.2 Member checking

A related method for enhancing validity is member checking, which was employed in both phases of the research process and involved all three case studies. After completing data gathering through interviews, I sent the transcripts for corrections and received some comments. In addition, I compiled a report for each case study at the end of phase one and again submitted the reports for feedback. To counter validity threats associated with uneven feedback (see discussion in 4.4 above), a third layer of member checking took place at the beginning of the second phase when mirror data from the first phase was presented for members to check and reflect on (see Table 4.3 for an example). Then, after holding the CL workshops in each case study, I produced a report and sent it for comments. During the follow-up and feedback workshops that took place when I was about to leave the field, the main findings of the research process were presented (Case Study 1 and Case Study 3) for member checking and feedback. But in Case Study 2 the approach was different because instead of holding a feedback workshop I conducted feedback interviews. Research participants commented on the findings in a manner that validated them. Member checking of reports also provided participants with an opportunity to encounter and comment on the perspectives of other research participants as well as the interpretation of the researcher. Thus multiple interpretations encountered each other avoiding the mere formation of a pile of accounts which would have resulted in the risk of cacophony (Lehenkari, 2006, p. 87). Member checking therefore provided the main source of internal criticism.

4.4.3 Critical friends in a community of practice

Within a form of social learning process called community of practice is the notion of legitimate peripheral learning in a community of practice (Lave and Wenger, 1991), which the research worked with in order to enhance the rigour of the research process. I was one of the novices in the research community in which I exchanged knowledge and learnt with and from others. Within the university, I shared my work with fellow students for feedback during some of our Friday meetings and obtained useful insights. During CL workshop the research assistant (who was also a researcher in the Rhodes University and SAQA Change oriented learning and sustainability practices research programme) gave his views on what had worked and what could be improved in the following session. Beyond fellow students, critical friends were found in more experienced researchers in the form of educational and agricultural experts to whom I made presentations for comments during seminars: I presented

at two PhD weeks; four SAQA-Rhodes University seminars; and at the Sixth Workplace and Learning Conference in Denmark. Babikwa (2003) worked with critical friends to help clear his confusions and to obtain encouragement. Bozaleck and Matthews (2009, p. 27) noted that the concept of critical friends has origins in action research and the purpose is “to critique another’s experience by providing data and asking critical and provocative questions of each other’s work, and by using each other’s feedback to provide different lenses with which to view reality”. At each step along the way I obtained feedback that strengthened the research. Particularly useful was a one-week visit (2 to 9 July 2009) to the Centre of Activity Theory and Developmental Work where I met with Professor Yrjö Engeström and his colleagues, presented my work, and got their feedback. My encounter and subsequent communications with Professor Peter Sawchuk at the Work and Learning Conference provided rare insights to the study (see Acknowledgements). Critical friends provided the main source of external criticism in this study.

4.4.4 Prolonged contact with research participants

One of the ways to ensure that the quality of data is good is to spend some time in the field, with research participants and „get a feel“ for what is going on. The total time that I spent in the field was about 6 weeks, with an average of two weeks per case study. But what was also particularly important was how the time was spread. I spent about a week per case study near the beginning of the study to generate mirror data; and returned after about six months with regular electronic communication in between (see Table 4.5). This provided reasonable time to process the data before presenting it back to the participants in CL workshops. Although the CL workshops only lasted an average of 10 to 12 hours each, the time before, during and after the workshop was used to reconnect with research participants informally and to observe changes and other developments that were taking place. It also involved looking for further documents on the case studies under review. But what was probably most striking in terms of learning was conducting the feedback workshops several months after the first round of CL workshops. That contact made it possible to assess the extent to which agentive talk had been converted into action. The table below (Table 4.5) outlines the prolonged contact with research participants and critical friends in the study.

Table 4.5: Summary of workshop journey

Activity	Timeframe
1. Sending letters and making phone calls to interest people in the study in Zimbabwe, South Africa and Lesotho	May-June 2008
2. Negotiating access by further elaboration of the intentions and the process of the study	June-July 2008
3. Tool development	July 2008
4. Tool testing and revising	August 2008
5. Field work, first phase: a. Case Study 1 b. Case Study 2 c. Case Study 3	a. August 2008 b. September 2008 c. September-October 2008
6. Performing rituals of temporarily leaving the field: writing thank you letters to research participants	Within a week of leaving the field in each case study
7. Transcribing and data analysis for three case studies	October 2008-January 2009
8. Sharing transcribed material and obtaining feedback	November 2008-February 2009
9. Sharing reports (data in analysed form) with research participants and obtaining their feedback	November 2008-March 2009
10. Presentation of progress report to SAQA	November 2008
11. Presentation of MFS case study to an EE Masters groups to show how CHAT can be used	January 2009
12. Development of a framework for running change laboratory workshops in the second phase of the research	January 2009
13. Re-negotiating access: sharing draft plan and process for comment and negotiating dates and budget	February 2009
14. Conducting Change Laboratory workshops work in Zimbabwe and Lesotho	February-March 2009
15. Sharing emerging research findings with SAQA; at the Researching Work and Learning Conference 6 in Denmark; presenting the work at the Activity Theory Developmental Research Work Centre in Finland; presenting the same and feedback from Denmark and Finland during a PhD week at Rhodes	June and July 2009
16. Conducting a Change Laboratory Workshop in South Africa	August 2009
17. Holding feedback meeting with research participants in Zimbabwe	September 2009
18. Holding feedback workshop with research participants in South Africa	October 2009
19. Holding feedback workshop with research participants in Lesotho	November 2009

4.6 RESEARCH ETHICS

We need to look at researchers in agriculture differently, considering that they come and go. Over the years, many have visited thousands of poor communities around the world to study poverty and raise hopes of alleviation. Many of them have returned to comfortable academic positions, their reports have languished with powerful institutional experts in different countries. But the poor remain prisoners of their misery, hopelessness, humiliation and poverty. No wonder research is seen as a fruitless activity by many among the poor, of presumably far greater benefit – materially and in terms of careers – to the researchers than to their poor subjects. No wonder researchers are so often greeted with scepticism or with open hostility. (Vombatkere, 2009, p. 1)

There were a number of ethical issues that I had to grapple with, one of which was how to make the study useful to research participants. This guided the choice of an interventionist research orientation. The other ethical considerations are discussed below.

4.6.1 Prior informed consent

In keeping with principles of good research, throughout the research process, I observed the cardinal rules of ethical principles seeking prior informed consent (Cohen et al., 2007). Securing informed consent means “the knowing consent of the individuals to participate as an exercise of their choice, free from any element of fraud, deceit, duress or similar unfair inducement or manipulation” (Berg, 1998, p. 47). Consent was first sought by phone and by e-mail. Upon meeting the research participants, I spent time to explain what the research was about and obtained further verbal consent. Consent was also specifically sought before taking still and video pictures and there were no instances when research participants declined. In Lesotho, where I could not speak the local language, translation was used to discuss consent. However, certain issues cannot be predicted and do not conform to prior informed consent. For example, one of the model solutions developed in Case Study 2 was the formation of an organic association for farmers, retailers, facilitators, local government and retailers in Durban. The participants drew up principles that included inclusivity – that each stakeholder group had to be represented, but when the Board was constituted some groups were either not represented or under-represented. This was an ethical issue encountered in the research which illustrates a challenge in interventionist research where one cannot tell the nature of intervention that will emerge.

Bassey (1999) discussed three central ethical issues in research, which also guided this study: respect for truth; respect for democracy; and respect for persons. In deciding on how to respond to the matter of exclusion of some stakeholder groups in Case Study 2, I was guided by the principles of respect for truth and for democracy. The research participants had agreed to form an association based on particular values and principles and in my view they were not being adequately observed, so I asked why and went on to interview one of the stakeholder groups that was excluded – but in a manner that I saw as responsible. In Case Study 3 during the feedback workshop, research participants pointed out that one of the contradictions in the promotion of their practice was associated with the tension between the individualism of the MFS promoting institutions and cooperation among them. In the feedback meeting with the leaders of these organisations, in respect for truth and at the same time maintaining the anonymity of the persons who raised the issue – in order to do no harm – I communicated the concern. But these ethical dilemmas were not always comfortable or easy to deal with. In Case Study 1, a difficult issue arose when one of the research participants who was to attend a feedback workshop and whose relative passed away a day before the workshop, asked me to help him by carrying some of the mourners and a coffin on my way from Harare on the

day of the workshop. It was difficult to decline and the main dilemma was concerned with starting late, which would have implications for other participants. When I arrived about 45 minutes late, the other participants were about to leave because they had other commitments. A compromise was reached to go ahead with the workshop but only within the time that remained – about 2 hours 15 minutes, which proved adequate.

The table below (Table 4.6) provides summarised details of research participants and data gathering methods used at different stages of the research process.

Table 4.6: Summary of data generation with research participants

	Phase 1: Interviews, documents and observations in the field	Phase 2: Focus group discussions, observation of learning processes in workshop and of practice in the field.	
		Change laboratory workshop	Feedback workshop
Case Study 1	3 individual interviews 2 group interviews 4 farmers 6 development practitioners A total of 10 people involved (2 women)	Attended by 4 farmers, 4 Permaculture facilitators; 4 pupils and 1 government agriculture extension worker. It took place over 4 days and in about 10 hours. Researcher served as facilitator and had an assistant. (4 of the 17 participants were women/girls)	2 farmers; 4 pupils; 4 Permaculture facilitators, researcher and assistant. Workshop lasted about 2.5 hours. (4 of the 10 participants were women/girls)
	11 documents and 1 website		
Case Study 2	10 individual interviews 5 farmers 1 farm worker 4 trainers 1 organic produce marketer A total of 11 people were involved (3 women) (1 person is active both as a farmer and as a trainer)	Workshop was attended by 16 people: 2 organic farmers; 2 farm workers; 2 organic trainers; 3 environmental educators; 4 rural NGO leaders; 1 photographer. Daily attendance ranged from 6 to 12. CL workshop lasted 12 hours and took place over 4 days. I worked as facilitator and worked with a research assistant. (8 of the 16 participants were women)	3 feedback interviews with 2 organic farmers/facilitators; 1 organic marketer; 1 funding partner. Interviews lasted 3 hours altogether. (2 of the four interviewees were women)
	4 websites		
Case Study 3	3 individual interviews 4 group interviews 31 farmers 5 development practitioners A total of 38 people were involved (21 women and 17 men)	Attended by 2 MFS promoters; 8 farmers from two districts of Lesotho; and 4 government agriculture extension workers. I worked as researcher and facilitator, with an assistant. Workshop took about 12 hours, in 4 sessions over two days. (9 of the research participants were women)	5 MFS farmers and 2 MFS facilitators attended a 2 hour feedback workshops; 2 MFS facilitators were interviewed for an hour. (5 of the 9 participants were women)
	10 documents		

4.5 DATA ANALYSIS

The process of data generation was followed by that of data analysis. In order to facilitate analysis, I coded all the interviews that were held. The interviews that were held in Lesotho (Case Study 3) begin with an L; while those in South Africa (Case Study 2) and Zimbabwe (Case Study 1) begin with an SA and a Z respectively. The interviews are also assigned numbers in order to differentiate them in each case study. In the case of Case Studies 2 and 3 where I also conducted interviews to share feedback on the research process – in the expansive phase of the research – the interviews are prefixed with the first letter of the country followed by the letters FB (for feedback), followed by a number. A Case Record enabled me to capture relevant information for each case study, including case specific analyses and reflections, which then became an important source of semi-processed information in the writing of the thesis (The Case Record is saved onto a CD ROM attached as Appendix 6).

I moved from analysing each interview (see Case Record Sections 2.4; 3.4.1 and 4.4.1), to analysing interviews in each case study (see Case Record Sections 2.5; 3.5 and 4.5), to analysing the three case studies individually and collectively (Chapters 5 to 8). I used theoretical lenses (see Chapter 3) to aid me in analysing the data: the second and third generation activity system and its associated layers of contradictions; and I sought an explanatory principle using critical realism layers of reality. I also employed Bourdieu's theory of habitus for clues on dispositions associated with our unconscious actions in practices; and Archer's concept of morphogenesis to explain how farmers may be exercising their agency and to what extent. During CL workshops, participants were directly involved in the historical and empirical analysis of contradictions and limitations in their practices. I worked with research participants in the field to carry out the first level of data analysis through interrogating contradictions that are present in their respective agricultural practices borrowing from CHAT and expansive learning. Beyond that, I conducted cross-case analysis within each set of case studies to draw out learning. The analysis was shared with research participants during feedback encounters in order to sharpen and validate it.

In the final writing up of this study, I drew on a critical realist analysis framework (Danermark et al., 2002) and employed inductive, abductive and retroductive analysis (see Appendix 5). Abductive analysis allows the emergence of themes from data; it takes place when one uses theoretical lenses to make sense of data and is characterised by a movement from the concrete to the abstract. Retroductive analysis is concerned with establishing explanations of what must be the case for things to be the way they are (Danermark et al., 2002). In discussing abduction Danermark et al., (2002) noted that:

Here we interpret and redescribe the different components/aspects from different hypothetical conceptual frameworks and theories about structures and relations ... Here several different theoretical interpretations and explanations can and should be made, compared and possibly integrated with one another. (p. 110)

As already discussed, the theoretical lenses that were employed in abductive analysis in the research are: structure and agency, relationalism, CHAT and theory of habitus/practice (see Sections 3.2; 3.3; 3.4 and 3.5). Retroduction analysis consisted in finding explanatory principles and causal mechanisms and often relied on examining history and contemporary structural issues for their explanatory powers. Chapter 5 which explores farmer learning processes is primarily organised according to inductive analysis but also offers other forms of analyses. Chapter 6, which focuses on surfacing contradictions in third generation activity systems of the three case studies, primarily employs retroductive analysis. Chapter 7 which focuses on the modelling of solutions to contradictions employs abductive analysis, using the CHAT framework. Chapter 8 also uses abductive analysis using agentive talk which was drawn from both CHAT and critical realism. Chapter 9 is a synthesis of theoretical reflections, while Chapter 10 makes recommendations which are informed by the analyses conducted in Chapters 5 to 8 and synthesis in Chapter 9.

I developed a tool (see Appendix 4) that helped me to conduct abductive analysis which compelled me to look for the following aspects: object of learning or work; mediating tools; rules; community and power relations; contradictions and limitations; relational agency; habitus; tacit knowledge; time-space considerations; structure and agency relations; motivation/incentive; causal mechanisms (culture, power relations, biophysical factors and scores for ecological, economic and social sustainability performance of the practice. The tool drew on the theoretical framing discussed above and also sought to address some of their limitations (such as relational agency in CHAT). I developed this tool after recognising that the initial tool which was primarily based on CHAT was inadequate to enable me to handle the data generated in the study (see Appendix 4). The table below (Table 4.7) shows the layers of analysis in the research which reflected double hermeneutics as advised by Cohen (1989) and Danermark et al. (2002):

In order to understand and explain the social world, as social scientists we try to understand and explain what meaning actions and events have to people, but we also endeavour to produce concepts, which make it possible to transcend common sense and attain a deeper understanding and explanation of a more abstract character. This is called the double hermeneutic of social science. (Danermark et al., 2002, p. 200)

Table 4.7: Summary of the analysis framework

Type of analysis	Mode of inference	Research question addressed
Interviews analysis	<ul style="list-style-type: none"> • Inductive analysis • Initial categories from field work interviews and observation 	<ul style="list-style-type: none"> • How do farmers learn about sustainable agriculture in their workplaces? (Appendix 4.1)
Activity system analysis in each case study	<ul style="list-style-type: none"> • Abductive using second generation CHAT • Historical analysis 	<ul style="list-style-type: none"> • How do farmers learn about sustainable agriculture in their workplaces? • What are the current limitations and contradictions of sustainable agriculture learning processes among farmers? (Chapter 5)
Cross-case analysis leading to identification of learning processes, enablements and constraints	<ul style="list-style-type: none"> • Inductive analysis to establish themes. • Abduction drawing on CHAT; and theory of practice • Retrodution using critical realism’s causal mechanisms that explain why learning is mediated the way it is. 	<ul style="list-style-type: none"> • How do farmers learn about sustainable agriculture in their workplaces? • What are the current limitations and contradictions of sustainable agriculture learning processes among farmers? (Chapter 5)
Analysis of contradictions	<ul style="list-style-type: none"> • Abduction using CHAT underpinned by causal mechanisms which lead to retroductive analysis to establish what must have caused the contradictions. 	<ul style="list-style-type: none"> • What are the current limitations and contradictions of sustainable agriculture learning processes among farmers? (Chapter 6)
Analysis of CL workshop processes	<ul style="list-style-type: none"> • Abduction using CHAT concept of zone of proximal development and working with the expansive learning process which resembles co-learning to move from the need state to the desired state. Located in third generation CHAT characterised by boundary crossing. 	<ul style="list-style-type: none"> e. How can sustainability be better learnt and more reflexively practised in the farmer’s workplace? (Chapter 7)
Micro-analysis of learning processes	<ul style="list-style-type: none"> • Abduction informed by a critical reading of Sannino (2008), Engeström (2008) and Sen’s 1999 capability thesis (in Lister, 2004) on agentive talk. 	<ul style="list-style-type: none"> f. What conceptual artefacts can the study develop to support expansive learning for sustainability in farmers’ workplaces? (Chapter 8)
Cross analysis of theory in relation to the study	<ul style="list-style-type: none"> • Abduction by discussing how the theories applied in a the context of change oriented learning and sustainability case study worked and what could be improved 	<ul style="list-style-type: none"> g. What conceptual artefacts can the study develop to support expansive learning for sustainability in farmers’ workplaces? (Chapter 9)
Practical recommendations (Case based)	<ul style="list-style-type: none"> • Abductive based on the perceived zone of proximal development for each case study and what could be done to move towards the desired state • Retroductive inferences to develop a history of the future of sustainable agriculture practice globally based on the same notion. 	<ul style="list-style-type: none"> h. How can sustainability be better learnt and more reflexively practised in the farmer’s workplace? i. What conceptual artefacts can the study develop to support expansive learning for sustainability in farmers’ workplaces? (Chapter 10)

The research process, including the analysis, enabled me to progressively deepen contextual and theoretical knowledge and shaped the categories of analysis as I proceeded with deepening insights as discussed in the next section (see Section 4.8).

4.8 REFLEXIVITY IN THE RESEARCH JOURNEY

Reflexivity formed a central impulse of the study to ensure rigour and contribute towards better quality research. Various researchers have underlined the importance of reflexivity in research and these include Lather (1986), Janse van Rensburg (1995) and Bourdieu (2004). This study utilised researcher reflexivity as a validity mechanism in the qualitative and participatory engagement research process. This section discusses the different levels of reflexivity that were experienced during this study.

4.8.1 Understanding learning *with*

Looking back now, at the end of my research journey, I realise how central the word „with“ was. I worked with research participants, focussing on their practices. They worked with what they had and what they could get together in order to address their contexts. The research demonstrated how different actors in the sustainable agriculture movement could enhance their agency by working with one another: farmers; trainers and entrepreneurs on new practices. It also underlined how these „converted“ should work with those opposed to what they were doing in order to find common ground, shared objects towards which to work together. This thinking in itself was under-laboured by dialectical thinking and relationalism at philosophical levels. The epistemological theory of CHAT also underlined the value of working with dialectics, with contradictions, with different perspectives, with distributed knowledge, with different time horizons and logics, and with competing interests and time.

Constructing and crossing the zone of proximal development for activity systems entailed a kind of working with others in newly developed or old and revived communities of practice in the study. This understanding and the expansive learning processes that characterised the research processes enabled me to go beyond naïve forms of research that conflate or ignore some forms or sources of knowledge. This is why modelling of solutions to new and emerging problems was done not by the individual but between and among them, jointly – which also implies „with“.

Sustainable development and its niece sustainable agriculture underscored the importance of working with nature and culture, not one against the other. Consequently as discussed in Chapter 2, sustainable agriculture is concerned with addressing the ecological, economic and social values and interests simultaneously: short and long term interests; traditional and conventional agriculture practices.

4.8.2 Reflexivity at a technical level, using methods

4.8.2.1 Note taking

During the first case study, I took copious notes of the interviews but realised that it was also necessary to tape-record the interviews. Consequently, all subsequent interviews and workshops were tape-recorded.

4.8.2.2 Workshop participant selection

The first CL workshop, which was conducted in Zimbabwe, was attended by Permaculture farmers, teachers and students (12) and one government agriculture extension worker. What I realised was that the under-representation of government extension workers made it difficult for participants to engage with issues that the department of agriculture needed to take up. This generally limited discussions to primary and secondary contradictions. Consequently during the second CL workshop in Lesotho, the proportion of government extension workers increased and the issues tackled did include quaternary contradictions. However some of the business-related issues could not be adequately addressed because there was no business representation. In the third CL workshop held in South Africa, I made it a point to include both government and business representatives or at least to find a way to „re-present the absent“. Two organic farming entrepreneurs attended the third CL workshop and this seemed to have a great influence on the dynamics of the workshop.

4.8.2.3 Time allocation for CL workshops

My original plan to run four two-hour workshops had to be adjusted during the first CL workshop, resulting in a total increase of time of two hours for the entire workshop. I decided to increase the time allocation for subsequent workshops to four three-hour sessions. A related challenge in the second CL workshop was that not many participants would be willing to travel and attend three-hour workshops over four days. We negotiated and agreed to two sessions per day. While this worked in terms of saving time, intensive concentration for six hours in a day proved a challenge as participants looked and said they were tired. These experiences had implications for the third and last CL workshop where we resorted to four three-hour sessions per day. The most important innovation was making attendance flexible so that people could attend on days of their choice. This worked well and the majority attended two of the four days. Each session began with a recap of the previous sessions.

4.8.2.4 Language

In the first CL workshop, participants used their local language in group work and English in plenary sessions. In their evaluation reports, about 20 % responded in the local language. This suggested to me that I had to think more about language in subsequent workshops. In the second CL workshop held in Lesotho, where English is not commonly spoken, we introduced

translation in all plenary sessions. This meant that plenary sessions took about twice as long as they would have if one language was used but it also enabled a significantly increased level of participation. This meant that time allocation should have been longer to allow for translation. In the third workshop language was not an issue among participants. Farmers who spoke the local language were unfortunately not represented although their issues dominated discussions through a deliberate strategy of „re-presenting the absent“ (see Sections 8.2.4 to 8.2.6).

4.8.2.5 Working with models in the field

The activity system model was used in the first CL workshop and when participants were asked to write about what they found useful, none referred to it but all referred to the expansive learning model. My conclusion was that they did not have a good grasp of it even though they used it to describe their practice. In the second CL workshop I decided to write up a farming story that would introduce the concept of an activity system because people in southern Africa historically learnt through stories. But when I got to the workshop and we had to do translations, I decided to leave out the activity system altogether. I used force field analysis instead and it did help in bringing out issues that participants were facing in MFS. And this is consistent with CHAT thinking as models such as activity systems are meant to serve as tools to mediate forms of learning and agency (and not to disable them). In the third CL workshop, we worked with activity systems as well but it appeared too complex an idea. The essence of it did, however, help participants to surface contradictions as well as locate these in the local and broad development landscape. In the analysis that I conducted as a researcher, I related the discussions to activity systems as is consistent with abduction and retroduction. Each CL workshop worked with the expansive learning cycle, which was augmented by Seppänen’s four-steps to implementing a solution to which all participants could easily relate (Figure 4.3).

4.8.3 Reflexivity when technical and conceptual issues are intertwined

4.8.3.1 Modelling solutions

In the first two CL workshops (Case Studies 1 and 3) the process of determining contradictions on which to work involved scoring and ranking by participants. They would then go into groups to analyse the contradiction before modelling solutions to three contradictions. One of the three contradictions was common to both groups. The groups would then present to each other their solutions and critique each other as a form of examining the solutions. Given the time available for deliberation, this approach did not seem to provide adequate time for developing robust solutions, with the necessary details. However, judging from what transpired soon after the CL workshop in Case Study 1, the workshops provided germ cells for triggering change processes in the case study and across

the activity system. In the third CL workshop, two subtle changes were effected: the scoring and ranking guided but did not determine which contradiction to work on, and the researcher had a say. Secondly, participants worked not on five but just one of the prioritised contradictions (see Section 7.4.5). Of the three that were chosen, the researcher recommended focusing on the third-ranked because of its potential and participants agreed. This approach allowed a deeper engagement with the solution and would be recommended in other situations.

4.8.3.2 Defining a shared object

In the first two CL workshops (Case Studies 1 and 3) inadequate attention was paid to developing an explicit shared object of the participants or of their activity systems before modelling solutions. This was based on a conflating of the activity systems of research participants (which therefore meant that the shared object was constructed from the mirror data) (see Section 7.2.2; Figure 7.). After analysis, we discovered that it would be more fruitful to focus on boundary crossing situations. Consequently, the third CL workshop defined the shared objects at two levels: at the level of all activity systems of organic farmers; facilitators; entrepreneurs, researchers and educators, donors, NGOs and government; and at the level of a specific linkages problem that was identified in the sector to look at the shared object for linkages among organic farmers (small scale, emerging and successful); organic marketers (small and medium enterprises); organic farming promoters; and the local municipality (see Section 7.4.2).

4.8.3.3 Highlighting local innovation

In the first CL workshop there was a low focus on local innovation partly because nothing emerged as particularly striking and partly because there was not enough searching for this. In the second workshop one farmer spent about half a session sharing the innovation he had made in the design of fields in which he practised MFS by altering the planting design. His new design made increased plant density and harvests possible while at the same time making it easier to plant and harvest (see Section 7.3). Farmers from the neighbouring community and government extension workers heard of this for the first time and decided that they would invite him to share this best practice. This served as an example of how a solution that was already developed could be scaled out through the workshop. In the third workshop (Case Study 3) a number of innovations were shared and I as a researcher followed up on one of them outside the workshop. This time the purpose of telling the innovation transcended its internal qualities and application. I later used this example to illustrate the notion of contradictions, double-binds, and how they were actually used in solutions that worked on the context (see Section 6.7, Box 6.5). This was captured in the report of the workshop which was sent to all participants (see Case Record Section 3.7).

4.8.3.4 Feedback workshops

My original intention for holding feedback workshops was to share what was emerging from the study, to thank research participants and leave the field. However, before holding the first feedback workshop, I realised that it would also be an opportunity to hold another session of CL with research participants where we could share and examine how they had implemented some of the solutions they had worked out, and how they were planning to move forward with the expansive learning process. We used this approach in all case studies. I had also learnt, through transcribing CL workshop interviews, that selective recording of sessions resulted in missing out some important parts of the workshop deliberations and that the notes which I had compiled on the CL workshops would not be adequate if not backed up by the words of the research participants. Consequently, the entire feedback workshop proceedings, except when research participants asked otherwise, were recorded.

4.8.4 Field based reflexivity

Bourdieu (2004) discussed the notion of field based reflexivity which in this case study would refer to what I learnt about change oriented learning and sustainable agricultural practices through the research process. The cross-cutting aspect of sustainable agriculture was that all the sustainability practices under examination had the triple object of ecological, economic and social sustainability. Before commencing the research, I was conscious of the economic and ecological interests. In connection with organic farming, I came to learn about Participatory Guarantee Systems and how they are being used to empower both producers and consumers towards more sustainable ways of eating and producing which are also suited to local ecological and social conditions. I came into the research with a view that sustainable agriculture did not have mechanisms to allow the poor and local consumers to contribute to the development of the practice. In the MFS, I learnt about the significance of relay cropping and how it „expanded“ space by enabling more than two sowings and harvests in a year from one piece of land. Another insight that I gained was that intercropping not only utilises the different micro-ecological environments in a field or garden, to provide for different nutritional requirements of the farmer but also to spread risk of crop failure and they often mature at different times and have different moisture requirements. From interviews with farmers, I got to understand the centrality of risk minimisation, especially with the increased uncertainty about when it will rain and when frost will hit. I had always wondered why MFS did not grow significantly beyond Lesotho as an alternative sustainable agricultural practice and came to realise that it was partly because stigmatisation and also because it was not adequately documented. It seemed largely to work „because it worked“. The research process made me realise the potential of change oriented learning methodologies such as the expansive learning cycle, to support farmer learning processes in ways that are empowering. Finally, the research also enabled me to develop an appreciation of the significance of time and space configurations in the mastering, appropriation and development of sustainable

agriculture practices (see Section 5.6). In a sense therefore, the research enabled me to develop a more sophisticated understanding of the sustainable agricultural practices discussed in the study.

4.8.5 Reflexivity of DWR as a process of learning

The ongoing reflexivity in the research process was important to the development of both theoretical and practical aspects of the study and to the applications of Developmental Work Research (DWR) and the expansive learning process. This was enabled also through the process of moving from the field to the cabinet and establishing a cabinet in the field (Massey, 2003)¹⁰. The main reflections that I have on the expansive learning process are that:

- The expansive learning process takes time because of the need to surface contradictions and to be able to bring together different stakeholders with different voices to engage authentically. The time implications are particularly significant when it comes to making provisions for establishing what happens after the development of model solutions. If a researcher ends the journey at the stage of modelling solutions and analysing agentive talk, there is a danger that they may leave the field with an over-optimistic view of the agency that they helped to activate. Case Studies 2 and 3 showed how difficult it can be to move beyond the stage of getting ready to act as real-world interests and obstacles are encountered (see Sections 7.3 & 7.4).
- CL workshops constitute an important part of the expansive learning process by bringing together different voices, distributed cognition and creating a platform for the modelling of solutions. But the bulk of the expansive learning may actually take place outside the workshop as the agency, which is stimulated, does. This was amply demonstrated in Case Study 1 where research participants on their own convened at least three meetings with members of the community, socialised their model solutions and had them „sponsored“ through contributions. The research participants also engaged the local and district political leaders to resolve contradictions that they encountered (see Section 7.2). In Case Study 2, some of the research participants spent time researching a model for the proposed association and having a logo for the newly formed organisation developed. In Case Study 3, research participants met the district leaders more than once to lobby for allocation of a plot where they could demonstrate how MFS works. As mentioned earlier, it is almost impossible to be present as researcher throughout the process.

¹⁰ Massey uses the word ‘field’ to refer to the place where data is generated with research participants and ‘cabinet’ as a place where data is analysed and processed. The CL workshops served as an important place and process for analysing data and innovating solutions with research participants in a manner that made these workshops serve the purpose of both field and cabinet.

- Expansive learning processes in this study produced secondary and tertiary tools (see Sections 9.4.1 to 9.4.7). While the secondary tools such as the letters addressed to the local leaders such as the councillor and the school headmaster in Case Study 1, were critical for developing agency (see Section 7.2), the greatest potential of expansive learning seems to lie in the creation of tertiary tools. It was the formation of a committee with a shared object in Case Study 1 that enabled action and further reflexivity to take place. It was also the formation of a Durban Organic Forum that led to the development of a Green Growers Association, which has capacity to exercise agency and work on the context.
- Distance appears to have particular significance in DWR as research participants work through the expansive learning process. In this case I use distance to refer to the space between research participant in terms of physical distance, social distance and ideological distance. The greater the distance, the more energy is required to build trust. Where people live close together and are likely to meet one another more often, there is greater opportunity for closer collaboration. This appears to have been one of the factors that enabled research participants in Case Study 1 to work jointly and effectively. In Case Study 2, social and historical distances among research participants seemed to come in the way of building the association according to the principles that had been agreed upon. Some groups of people were excluded from the steering committee that was to become the Board. It does appear that when groups of people that have not historically worked together are asked to work jointly towards a common object, significant energy is required first for them to „meet each other“ before moving towards the shared object together.
- All in all, I found the DWR to be a strong and effective methodology for dealing with dialectics and enabling reflexivity and agency among research participants, tapping into their distributed knowledge and building their collective and relational agency. It is a learning methodology that enables deframing, reframing and transformative learning which is consistent with contemporary social learning processes that emphasize dealing with complexity, uncertainty and risk (Glasser, 2007; Wals, 2007). Through the expansive learning process, one is able to see how knowledge can be power (see Section 8.1; Mukute, 2009). The expansive learning process was also useful for examining the macro and micro level issues related to learning and development. Building on the work of Sannino (2008) on agentive talk, perhaps the research's main methodological contributions lie in suggesting a tool that can be used for analysing agentive talk in intervention workshops as well as in how reflective talk could also be analysed to look for traces of learning (see Sections 8.2-8.5; Mukute & Lotz-Sisitka, 2009c).

4.9 CONCLUSION

From the above discussion, it is clear that participation in the DWR process was a learning process for me that also enabled the development of reflexive insights about supporting expansive learning processes. In a sense, the social learning research process is a social learning process in itself. In this chapter, I have also discussed how I went about generating data, much of it with research participants, how the data was analysed and validated and some of the challenges that I encountered in the research journey. The next chapter (Chapter 5) is located in the exploratory phase of the research and is concerned with addressing the question of learning processes that were already taking place in study sites (see Section 1.5).

CHAPTER 5: Incorporating sustainability in agriculture: Exploring farmer learning processes and challenges

5.1 INTRODUCTION

This chapter seeks to address the first research question (see 1.5; 1.7 and 4.5, Table, 4.7):

- How do farmers learn about sustainable agriculture in their workplaces?

This chapter deals with the interpretive layer of Engeström's three layers of causality of human action which is concerned with interpreting situations and establishing the logic of why things are the way they are (see Section 1.6.3). This chapter shows how information generated in three case studies as described in the previous chapter, provided perspectives on farmer learning processes and challenges. It is therefore mainly based on data gathered from the field through semi-structured individual and group interviews, document analysis, and CL workshops conducted in embedded multiple-case studies. The analysis begins by providing a brief description of the activity systems under analysis (see Section 5.2) followed by a short history of the three sustainable agricultural practices which highlight some of the structural and contextual factors that have a bearing on the learning and practice of sustainable agriculture in the three case studies under review (see Section 5.3). The history of a practice is central to understanding how it can be learnt and improved. The chapter then discusses what motivated farmers and sustainable agriculture facilitators to engage in their respective agricultural practices because object or motivation is a strong force that determines the direction of an activity system (see Section 5.4 and 5.5). Factors that shape how farmers are learning are also discussed drawing on document analysis, interviews and observations before looking for explanations concerning why and how sustainable agriculture practices are being learnt (see Sections 5.6 and 5.7). Section 5.8 synthesises agricultural learning and practices across cases, with Section 5.9 discussing what appears to be the main causal mechanisms that underpin the learning and practice of sustainable agriculture in the cases under investigation.

This chapter uses inductive analysis to let data speak for itself, and abductive analysis to use theoretical lenses to understand better what is emerging from the data. It also uses retroductive analysis to explain what must be the case for things to be the way they are (see Section 4.5, Table 4.7). Finally, the chapter lays the foundation for the next chapter which will concentrate on how research participants surfaced and worked on some of the contradictions to model solutions to some current limitations in their practices.

5.2 DESCRIPTION OF ACTIVITY SYSTEMS IN THE CASE STUDIES

This section briefly describes the activity systems that form the basis of the exploration of farmer learning processes and the challenges that are being encountered in association with the learning and practice of the three sustainable agriculture practices under review. These activity systems are presented for each case study¹¹ and have been deliberately reduced to those which took an active part in the research process although I am aware of other neighbouring activity systems that have a strong bearing on farmer learning and practice of sustainable agriculture. I chose to include, in each case study, those activity systems which were able to interact and develop a shared object, and work towards it during the course of the study (see Chapters 6, 7 and 8). Below is a box (Box 5.1) of the notes that I used to explain the concept of activity systems to research participants. In Chapter 8 I use the term „critical activity systems“ to refer to those activity systems that have a causal effect on the activity system under discussion. This covers tools, rules, community, subject, division of labour and object producing activity systems.

Box 5.1 An activity system in an agricultural setting

People learn and do things through activities and for a purpose. People such as farmers, extension workers and researchers are the **subjects** in agricultural activities. Among other things, farmers, as subjects, are driven by the desire to produce crops and animals to eat, sell and feel secure about the future and to keep their land productive. This is the **object** of their work. In order for farmers to do agriculture, they need resources such as seed, fertilizers and draught power. They also need the knowledge and skills to farm, which may be carried in their heads and hands, in their neighbours or in written forms. These different kinds of resources may be called **tools** even though some cannot be touched. Agricultural learning and practice is done in social, economic and ecological contexts. It is influenced by environmental factors such as soils, rains, snow and drought as well as by government policies, legislation and traditional norms. The natural and human-made conditions and provisions that regulate how farmers work on their objects, are collectively called **rules**. Farmers relate with other people who also affect their business. Such groups of people may be buyers of produce, suppliers of inputs, scientists, policy makers, transporters and these make up the **community** in which farmers are subjects. One of the important developments over the years that helped farmers to improve production is the sharing of roles in agriculture. For example, among family farmers, some members plant seed, others weed, and yet others harvest, transport or market produce. Sometimes people do the same duties together to make the work lighter or complete it sooner. This **division of labour** often helps farmers to farm better and can result in specialisation. All these parts interact together to form what is called an **activity system**, which can be represented in a triangle with lines that show the connections and how the parts fit together (see Section 3.4.2).

Sometimes the parts do not fit together. When this happens, there are problems in the activity system. The special word used to describe these problems is **contradictions**. Paying attention to these kinds of problems leads to the strengthening of a practice (what we do and say in farming for example) or improving our understanding of the purpose of our doings and sayings. The problems may be found in the individual parts (or elements) of the activity system or between them. At other times the clashes occur between the activity system of the farmers today and the one of the past or

¹¹ The activity systems are presented in the form of illustrative representations of complex and emergent activity systems.

the future, or between it and activity systems of other groups of people or organisations such as government or development organisations. Such contradictions can also be fertile ground for developing new and constructive solutions that improve the well-being and circumstances of those involved. It usually helps that when the contradictions are to be resolved, the minds and hearts and sometimes hands as well, of the concerned groups of people or organisations meet to think, plan, act, learn and improve things together.

5.2.1 Activity systems in Case Study 1

There are basically two activity systems that the study worked with in the SCOPE case study on Permaculture in the St Margaret Schools and its community. These are the farmer's activity system and the activity system of the school that practices and promotes Permaculture at the school in the community as well as in seven other schools in the district. There is a direct learning relationship between the school and farmers in the community, which covers not only sharing knowledge and experience but also sharing seed and other planting materials. Figure 5.1 provides representation of the farmer activity system without details of history, culture, contradictions or boundary crossing¹² based on second generation CHAT.

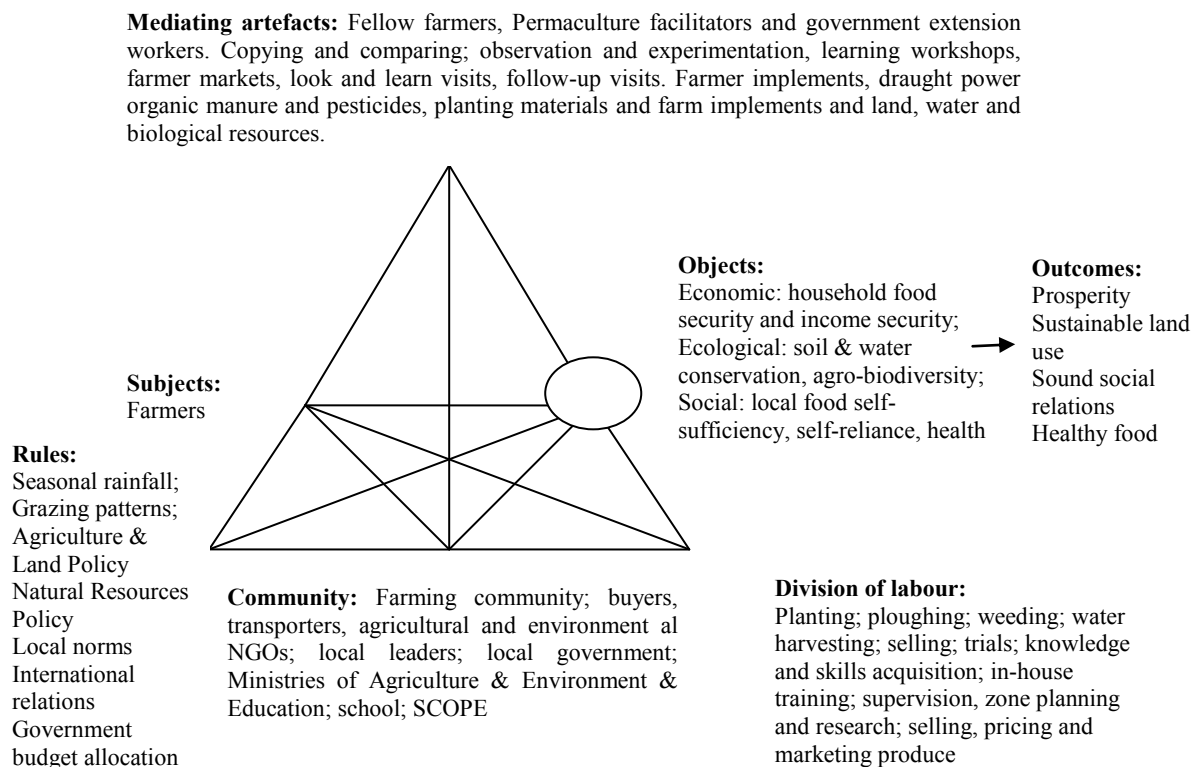


Figure 5.1: Farmer' activity system in SCOPE

¹² These aspects are dealt with in subsequent sections of this chapter as well as in Chapters 6 to 8.

Figure 5.2 that follows provides an illustrative representation of the St Margret Primary School facilitators in the SCOPE case study using second generation CHAT.

Mediating artefacts: Parents, more experienced/qualified Permaculture facilitators and NGO extension workers; learning workshops; handouts; books and other publications, lectures, group discussions, group activities, look and learn visits; planting materials, water and organic inputs; school grounds, biological assessments; transect walks; natural environment, water tank; water pump

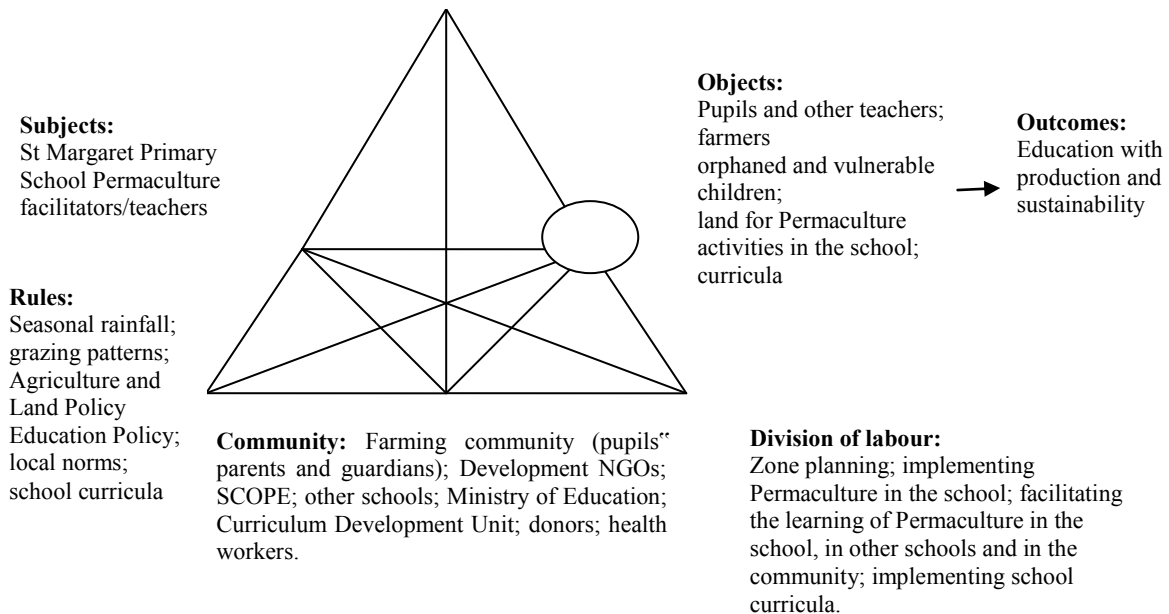


Figure 5.2: St Margaret Primary School Permaculture teachers' activity systems

5.2.2 Activity systems in Case Study 2

The study worked with three interacting activity systems in the Isidore community of organic producers and marketers. These are the farmers' activity systems, the organic trainers' activity system and the organic retailers/marketers' activity system. The illustrative representations of the three groups' activity systems are depicted in the diagrams below (see Figures 5.3; 5.4 and 5.5). Although conventional extension workers in South Africa did not take part in the study, there is literature to suggest that they are still operating in the technology transfer mode as pointed out by S. Worth (2007, pp. 140-141): "technology transfer prevails as the primary mode of extension in terms of training and practice of current extension practitioners in South Africa."

Mediating artefacts: Ecological principles, workshops; look and learn visits; learning by doing; observation; trial and error; organic inputs; farm implements; farmer to farmer extension; farmers; planting materials; land and other natural resources

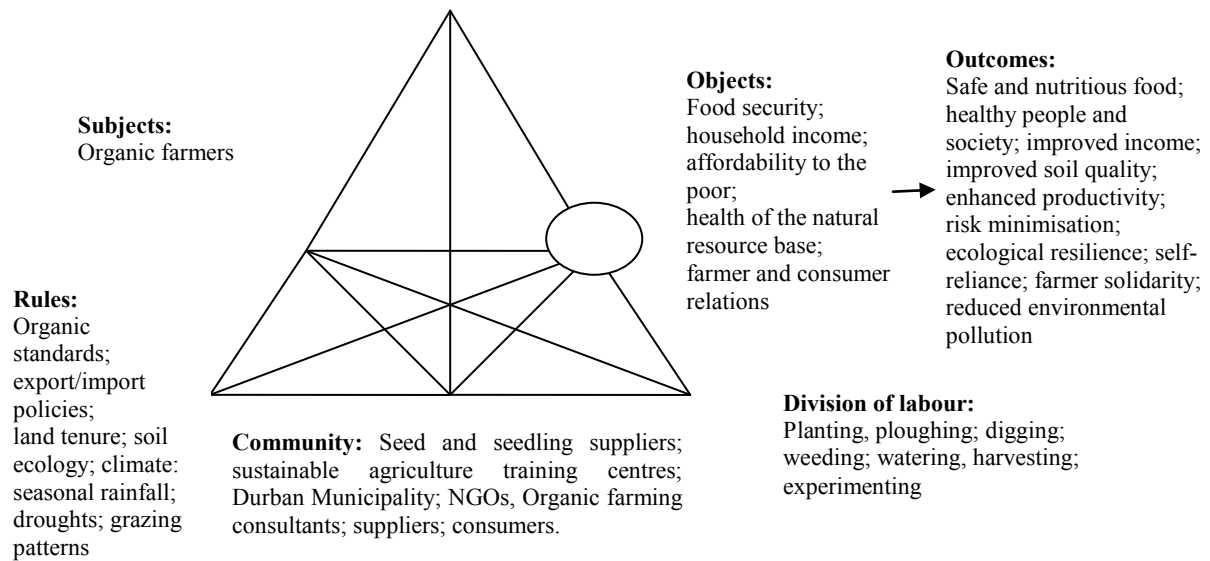


Figure 5.3: Isidore Organic farmers’ activity systems

An illustrative representation of the organic trainers’ activity systems is found in the figure below (Figure 5.4).

Mediating artefacts: Organic agriculture principles; long-term and short-term courses; Internet; books, manuals and other literature; farm implements; and working examples of organic farming

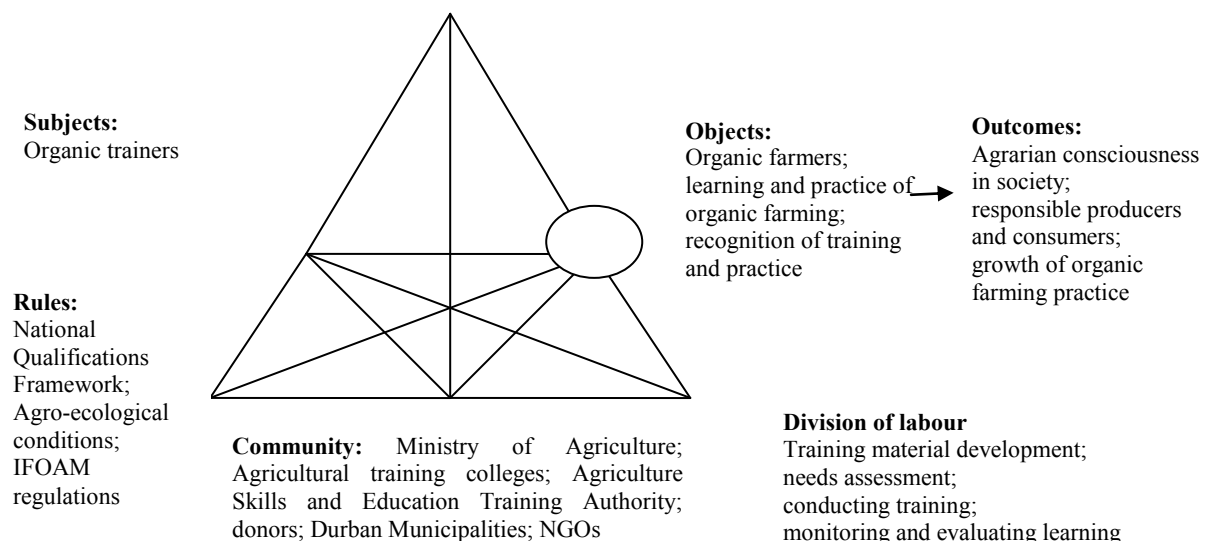


Figure 5.4: Isidore Organic trainers’ activity system

A representation of the organic marketers' activity system in the Isidore case study is depicted in Figure 5.5 below.

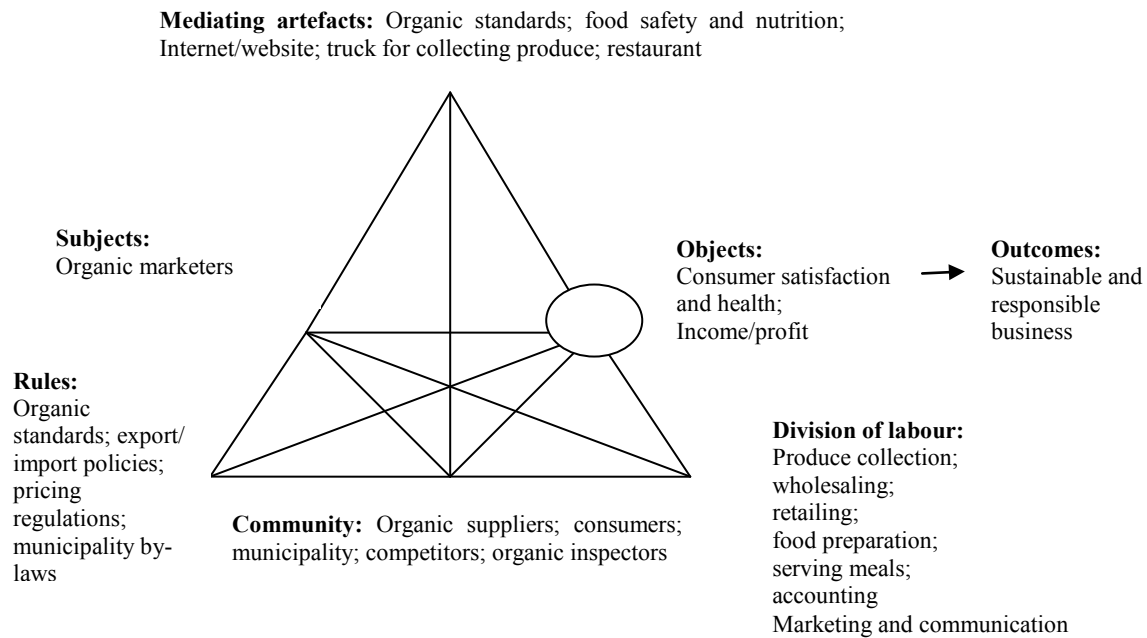


Figure 5.5: Isidore Organic marketers' activity system

5.2.3 Activity systems in Case Study 3

In the Machobane Farming System case study, the focus was on three activity systems: the MFS farmers' activity system; the MFS facilitators and tutors' activity systems; and the activity system of the government (conventional) agricultural extension workers. The activity systems that ordinarily interacted were those of the MFS farmers and promoters, while that of agricultural extension workers was often in tension with the other two. The illustrative representations of all three activity systems are depicted in the diagrams below (see Figures 5.6; 5.7 and 5.8).

Mediating artefacts: Demonstrations; MFS theory; meetings; workshops; planting calendar; indigenous knowledge; manuals in local language, farmer programmes on radio, farmer to farmer training; *matsema*; *lesielo*; *mafisa*; circumcision schools; farmer-saved seed; dry planting; natural pest control; kraal manure, wood ash and compost; intercropping; relay cropping

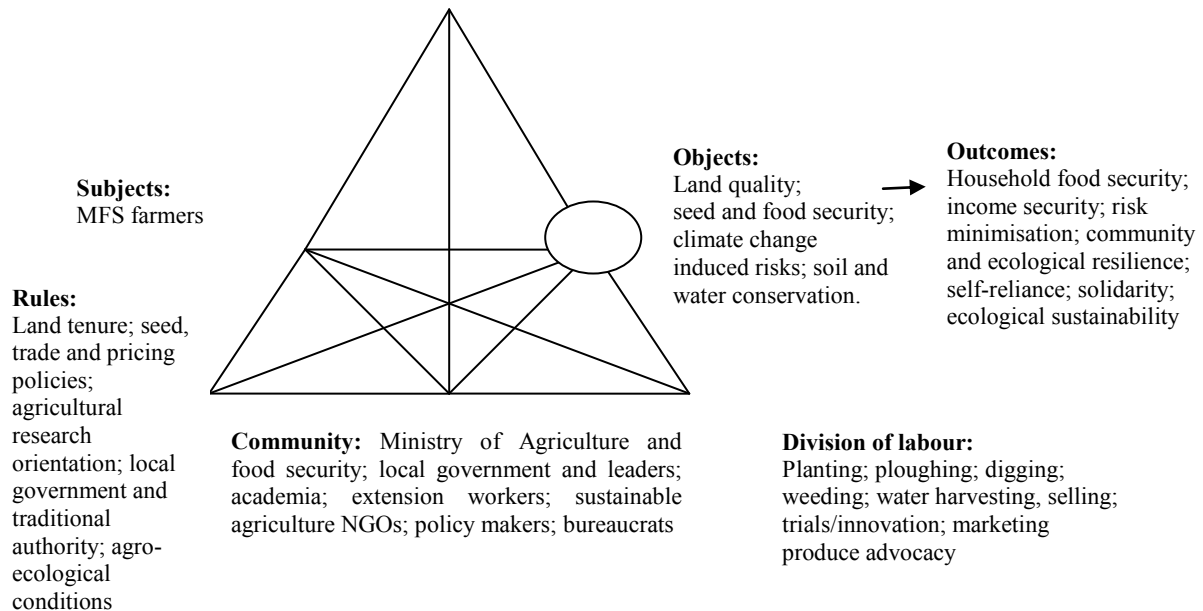


Figure 5.6: MFS farmers' activity system

A note on some of the mediating artefacts

Block farming in Lesotho refers to the grouping together of small tracks of land or fields that belong to different farmers so that they form „larger, economically viable and productive blocks“ under the management of one person. *Lesielo* is the loaning out of a female animal in order to share the offspring; both small and large livestock are used but mostly livestock with multiple and frequent births. *Mafisa* is looking after the livestock of another person in order to benefit from the by-products such as dung, draught power and milk. *Matsema* is when people come together to complete a task such as ploughing a field, weeding or harvesting and is not restricted to agriculture (Mosenene, 2000; Machobane & Berold, 2003). Gill (1993) described how Basotho boys underwent circumcision not merely as a physical exercise but also as a social one.

Initiation rites among the southern Sotho had become central to both the homestead and the chieftainship by the 19th century. It was the chief who periodically called for all boys of a certain age (usually those between the ages 16 and 20) to undergo a period of training together with one of his sons. These age mates would then be bound together for the rest of their lives under the command of the chief's son. Some would serve as his advisors ... In this way, a great deal of loyalty and interconnectedness would grow and bind families within the chieftainship together... The boys were taken away to a remote area and circumcised by a doctor. After their wounds had begun to heal, the boys were given a rigorous instruction by

certain specially trained instructors who were respected by the community. These instructors were called *mesuoe* from the verb *ho sua* meaning to make an animal skin soft and supple ... These instructors were to make the boys „soft and supple“; that is, fit for the community of adults, with important responsibilities in the homestead and larger political community of the chieftainship ... During the period of instruction, which lasted 4 to 6 months, boys were secluded in a remote valley or hilltop away from the village. A lodge (*mophato*) would be constructed and here they would rise early, performing a variety of tasks and undergo a harsh physical regimen. (Gill, 1993, pp. 54-55)

From Gill’s description of circumcision schools above, it is clear that they served as a place for learning societal values and practices through what has been called communities of practice (Lave & Wenger, 1991). MFS applies this concept by training a farmer through facilitators and tutors for five years before they graduate. Graduates then become tutors who also help new farmers learn the practices (Mosenene, 2000). Another important dimension that appears to arise from circumcision schools is solidarity among learners and graduates. The downside of circumcision schools in relation to the learning of others was that what happened there was kept a secret and would therefore restrict access to knowledge and skills learnt there (Gill, 1993). Initiation ceremonies had a strong educational component in other African cultures. For example, Baker (1986, p. 75) noted that among the Poro people of Liberia, Guinea and Sierra Leone, initiation training into society took as long as five years during which boys would be isolated from their tribe and taught the rituals and rites of society as well as practical skills such as farming, fishing, tool making and house building.

Mediating artefacts: Demonstrations; MFS theory; workshops; planting calendar; indigenous knowledge; manuals, farmer to farmer training; orientation meetings; seasonal training; farmer assessment and accreditation

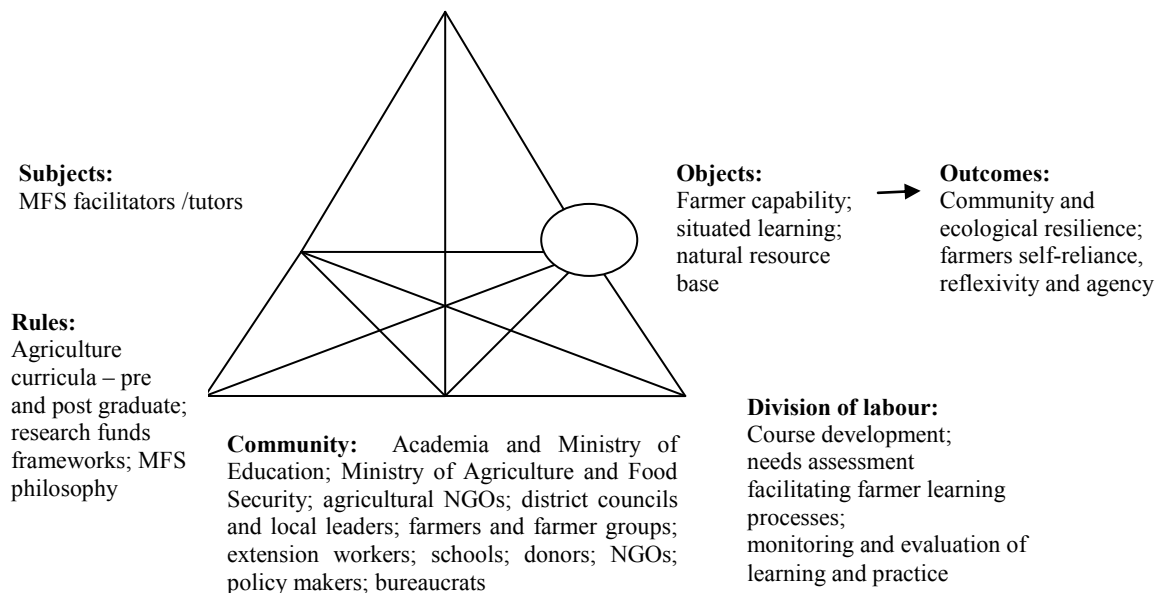


Figure 5.7: MFS facilitators and tutors activity system

Mediating artefacts: Demonstrations; block farming system, seed fairs; loan schemes; workshops and manuals; agro-chemicals; tractors

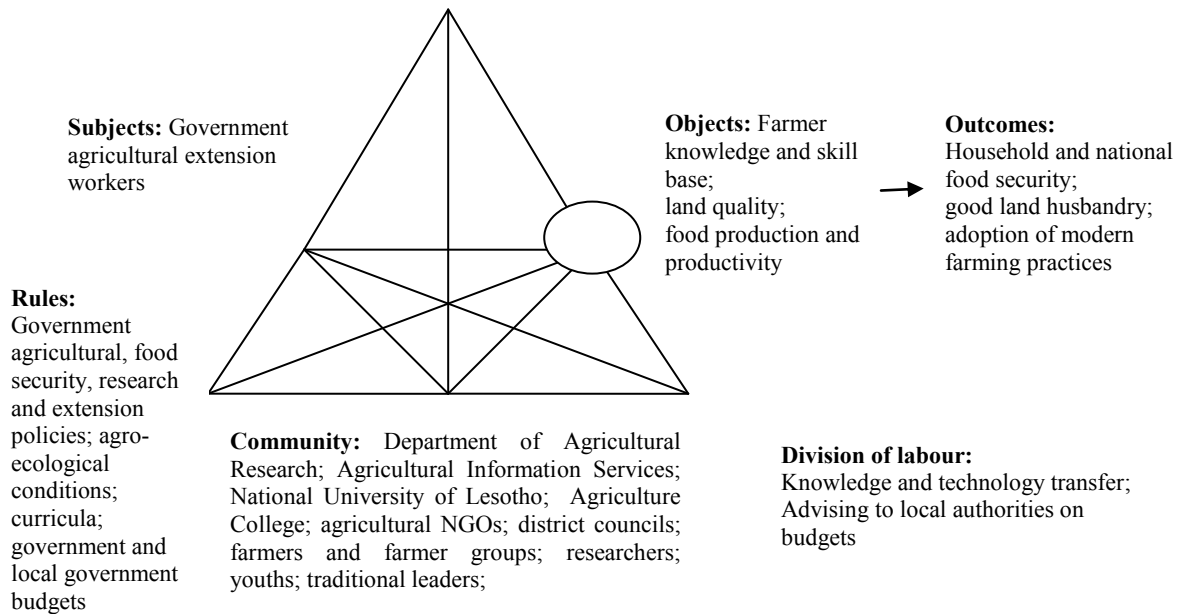


Figure 5.8: Agricultural extension workers' activity system in Lesotho

A note on extension workers as subjects

Röling (1988) extensively discussed the notion of extension which showed that it has various interpretations and uses in different parts of the world. In southern Africa it is generally associated with technology transfer but has other meanings elsewhere. In the UK, Germany and Scandinavian countries it refers to „advisory work“ to solve problems, while in the US tradition, extension education is used to describe an educational activity which seeks to teach people to solve problems by „extending information“. In the Netherlands it is used in the sense of keeping a light in front of someone to help them find their way – *voorlichting*, while in France it refers to simplifying information so that the ordinary people can understand it (Röling, 1988, pp. 36-37). Röling (1988) identified the following kinds of extension:

- Informative extension which supports the individual with information to make optimal decisions towards achieving their goals. The assumption is that the individual is free to use or not use.
- Emancipatory extension where the services provided are intended to emancipate and uplift the poor as in pedagogy of the oppressed. This has socialist and Christian traditions.
- Formative/human resource development extension which refers to extension that seeks to enhance the human being's ability to make decisions, to learn, manage, communicate with others, analyse the environment, become a leader, stand up to oppression and to organise.

- Persuasive extension which is used to induce certain types of behaviour such as care for the environment (Röling, 1988, p. 37).

The word facilitator in this study is used to refer to development workers whose role is to combine the four different kinds of extension discussed above – the people who mediate the farmer learning processes in sustainable agriculture practices.

5.3 HISTORICISING SUSTAINABLE AGRICULTURE PRACTICES IN THREE CASE STUDY SITES

The African tradition of cultivation, although empiric, teaches methods of rotation of crops, of usage of soils, and means of fertilization and even sometimes anti-erosion measures, which, though they may not be suited to modern demands on the soil, are often well adapted to the prevailing conditions of labour and climate. (Harry, 1938, p. 881)

Sustainable agriculture falls within the broader concept of sustainable development whose storyline is economic development which is environmentally benign and socially just (Dryzek, 2005; Yunlong & Smit, 1994; see Sections 1.7.4 and 1.7.5). The table below (Table 5.1) summarises the evolution of the three sustainable agriculture practices under review.

Table 5.1: History and main features of three sustainable agriculture practices

	Organic farming (IFOAM 2005; Clark, 2007; Organic Agriculture Centre homepage, 2008)	Permaculture practice (Wikipedia website, 2008; Mollison, 1991; Nyika, 2001, 2002; SAFIRE & UNHCR, 2004; SCOPE, 2004)	Machobane Farming System (Robertson, 1994 (IRR, 1998; Pretty, 1999, Mosenene, 2000; Machobane & Berold, 2003).
History	<ul style="list-style-type: none"> • Developed by agricultural experts in Europe and Asia in the early 1900s in response to industrial agriculture pollution. • Assumed global significance in the 1990s. 	<ul style="list-style-type: none"> • Developed by ecologist Bill Mollison in the 1970s in Australia in response to industrial-agriculture pollution, land degradation and biodiversity loss. • Introduced in southern Africa in the late 1980s. 	<ul style="list-style-type: none"> • Developed by farmer James Machobane in Lesotho the 1950s in response to erosion, land degradation, hunger and declining productivity.
Main features	<ul style="list-style-type: none"> • Must produce safe and nutritious food. • Should emulate natural ecological systems and cycles. • Ensure equity, respect, justice and stewardship between people and other living things across space and time. • Manage resources in a precautionary and responsible manner to 	<ul style="list-style-type: none"> • Create beneficial relationships between different elements in the system. • Grow as many diverse species as possible and use as many diverse production processes for nutrition, medicine, beauty, spiritual and economic value. • Take the long-view and plan for long-term 	<ul style="list-style-type: none"> • Use of organic fertilizer which is locally produced. • Ensuring perennial vegetation cover. • A cropping pattern adapted to the seasons of the year, which includes nitrogen fixing legumes, cash and food crops. • Natural pest control system.

	<ul style="list-style-type: none"> minimise risks. A comprehensive system of organic farming regulations in 60 countries including the EU, US and Japan. 	<ul style="list-style-type: none"> sustainability. Recycle, reuse and reduce waste. Build and enhance the number of beneficial relationships in a system to achieve stability. Copy the processes of nature to allow an environment to sustain itself naturally. 	<ul style="list-style-type: none"> Relay cropping Mass education.
Means of knowledge making and sharing	<ul style="list-style-type: none"> Consultancy services. Literature: magazines, bulletins and manuals. Short-term intensive training courses, with a practical orientation. Supervision and assessment of organic farming and farmers by inspectors. Farmer field schools. Internships. Local and international research. 	<ul style="list-style-type: none"> Mix of scientific, everyday and indigenous knowledge systems. Short-term practice-based training workshops by Permaculture organisations and trainers (72 hour course followed by two years of practice). Literature, electronic and print media. Working examples. Internships. Consultancy services. 	<ul style="list-style-type: none"> College-based training for trainers. Five-year „accredited“ farmer training. Learning and teaching by doing. Farmer to farmer learning. Draws on traditional agriculture and learning approaches. Farmer research and limited „western“ research.

Within each of these sustainable agricultural practice contexts, tensions exist. Broadly, organic and sustainable agriculture is pitted against conventional farming resulting in polarisation of sustainable and conventional agriculture. At a wider level, there are inherent tensions between sustainable agriculture interests and those of agro-business whose profits are dependent on chemical fertilizers, pesticides and genetic modification. More specific tensions and histories are elaborated in the case study descriptions below.

5.3.1 History of SCOPE and arising tensions

SCOPE was developed to promote “sustainable land use of school and college grounds and homesteads in the surrounding communities” and the integration of ecological principles into the curriculum (Nyika, 2001, p. 125). It was started in the mid 1990s in Zimbabwe, with support from the Ministry of Education for the programme to work with pilot schools (Mtetwa, 2006). Between 1994 and 2008, the number of schools involved in SCOPE increased from two to 126, covering all the districts of the country. Today 13 teachers’ colleges and six colleges of agriculture participate in the programme, with two universities providing advisory support (Mtetwa, 2006). SCOPE introduced a cluster system at district level where six or more schools are supported by a lead member to establish Permaculture in the school and the surrounding community. Following its success in Zimbabwe, a Regional SCOPE programme was established in 2007 to provide training and support to other countries (M.W. Nyika, personal communication, September 5, 2008). The main tension that arose from the history of the practice and the programme are the clash between the proposed

curriculum which had a sustainable agriculture orientation and the written and implemented curriculum which had a strong high external input orientation.

5.3.2 History of Machobane Farming System and emerging tensions

The MFS was promoted by an innovator (Machobane), and later by his college, and finally by NGOs in Lesotho, especially by the Rural Self Development Association (RSDA) the Machobane Agricultural Development Foundation (MADF). Between 1944 and 1956 the MFS was developed by Machobane; between 1957 and 1965 it was expanded and taught to 200 farmers who had success with potato harvests (Machobane & Berold, 2003). Despite this success, the initiative was undermined by government who feared the „alternative power and philosophy“ of the MFS, and subsequently closed the MFS college. Between 1970 and 1980 the innovator lived in semi-hiding, wrote a book on MFS, continued to teach MFS, and in 1990 he was paradoxically awarded an honorary doctorate by the state university in Lesotho (Machobane & Berold, 2003). The MFS was later reviewed by International Fund for Agricultural Development and NGOs such as RSDA and MADF who now promote and adopt MFS practices, despite dwindling resources from donors. During its historical development, a number of challenges arose in the MFS which included: stigmatisation of MFS, polarisation of MFS and conventional agriculture, and suspicion between government officials and MFS promoters (Pfothenauer, 1987; Robertson, 1994; Mosenene, 1999, 2002; Grandin, 2001; Machobane & Berold, 2003; Helvetas, n.d.).

5.3.3 History of Isidore Organic farmers' network of practitioners

Robert Mazimbuko from KwaZulu-Natal Province of South Africa (in which Durban is located) has been referred to as the one “who inspired a generation of South Africans to become organic farmers and to build on the African tradition of indigenous organic farming” (Auerbach, 2005 in Saruchera (2006, p. 9). Natal Isidore Organic Farm brings together a network of organic farmers in Durban, South Africa, to grow and market organic produce, share knowledge, seed and tools as well as provide training to interested „new“ organic farmers. The International Federation of Organic Agriculture Movements (IFOAM) was established in 1972 to disseminate information on the principles and practices of organic farming throughout the world (IFOAM, 2005). Between 1970 and 1980 farmers started advocating and adopting these practices and organic farming accreditation was introduced (Heckman, n.d.). In the 1990’s South Africa started producing various organic products. Organics Association South Africa estimated that there were 200 certified organic farmers in the country and a substantial number that were practising but not certified (Saruchera, 2006). In the early 2000s the Isidore network established a number of marketing outlets in Durban. Produce could not meet demand, and communities of organic farmers were established. Between 2005 and 2008 the Isidore Organic Farm consolidated and established a more

permanent marketing structure called „Earth Mother Organic“ (Earth Mother Organic homepage, 2009).

The community of organic farmers market their produce through this structure, but viability remained an issue. Isidore farm owners do off-farm activities to supplement income. Today, the complexity of national and international standards for organic farming, the pricing of organic produce and the certification system and its related costs, create challenges and contradictions among organic producers. Saruchera (2006, p. 10) argued that “the high certification costs currently charged by foreign companies are an impediment to the growth of organic agriculture and [the establishment of] local certification companies should be encouraged. South Africa is making progress in this regard.”

5.4 WHY ARE FARMERS INCORPORATING SUSTAINABILITY IN THE WORKPLACES?

Before discussing the ways in which farmers are learning sustainable agriculture, it is important to understand why they learn and practise it. In CHAT, the notion of motive is embodied in the object of an activity system, which also drives what happens in the activity system (see Section 3.4.3). The object evolves culturally and historically and carries collective meanings and motives with it (Engeström, 2000, in Daniels, 2008). This makes it important to understand why farmers and promoters of sustainable agriculture do what they do in their different activity systems. The analysis below is clustered around reasons that were offered in different case studies, focusing on two activity systems in each case study: farmer activity systems and promoter/facilitator activity system. It is an inductive analysis (see Sections 4.1 and 4.5, Table 4.7). As discussed in Chapter 3, the study also draws on Illeris’ concept of learning which he argues is underpinned by motives. Illeris (2004) brings two important dimensions into individual learning and performance which have a bearing on individual agency. Individuals have emotions and motivations that drive what they learn (or do not learn).

5.4.1 Extrinsic motivations of farmer adoption of sustainable agriculture practices

5.4.1.1 Farmers engage in sustainable agriculture for economic and ecological reasons

In all the three case studies, farmers indicated that their motives for adopting sustainable agricultural practices were concerned with affordability, potential profitability and methods which improved soil and water conservation as well as provided agro-diversity (see Sections 5.2.1 to 5.2.3; Figures 5.1; 5.3 and 5.6). Evidence from interview data is shared to provide a „thick account“ of this inference.

a. Evidence from Case Study 1

Researcher: *When did you start practising Permaculture and why?*

Farmer Mu¹³: *In the past we were made to believe that crops cannot grow properly if you do not apply chemical fertilizers. Permaculture taught us that it is possible and desirable to use organic fertilizer, which also improves the soil... Organic fertilizer is made from locally available resources... Permaculture also taught us about soil and water conservation not only in the garden but beyond, in the broader environment. We also learnt and applied intensive intercropping from Permaculture. Apart from skills, we also got new seed varieties, including herbs... You see, there is very little one must spend in order to produce. Besides, with intercropping, you can produce a lot of crops at the same time, each with a different value. The other thing that we do here is to make sure that there is something growing in each part of the garden during most time of the year. You see that the tomato crop has been harvested. We have plans for these beds. What makes this kind of agriculture sustainable is that you produce one crop after another, continuously.*

Farmer AB: *The social aspect is high because you do not talk about survival of the fittest. Everyone, even the poor people can practise Permaculture or sustainable agriculture. Most of the resources are locally available. For manure you can go and collect humus from the mountains. I know of some families whose lives were transformed by zero tillage. (Interview # Z2)*

b. Evidence from Case Study 2

Researcher: *In short, what drew you towards sustainable agriculture?*

Farmer: *Taking responsibility for my life ... So when I came across this Permaculture, it was about taking responsibility for my existence on the planet, to stop being a parasite, and to start actually contributing something not only to the environment but to society, but something real, something tangible, you know.*

Researcher: *What do you see as the potential of ecological agriculture?*

Farmer/facilitator: *The potential is global. It is poised to become the biggest industry worldwide, it is the only sustainable industry known to man at this point, it is ecological farming. What other industry is sustainable? It is the only thing that can perpetuate life on Earth, food production on an ecological basis. The other option is devastation. (Interview # SA2)*

The International Trade Centre (ITC) and Research Institute of Organic Agriculture (FiBL) (Research Institute of Organic Agriculture, 2007, p. 7) pointed out that among other ecological services, organic agriculture (and other forms of sustainable agriculture) has considerable potential to reduce greenhouse gases while at the same time the techniques that it employs can contribute significantly to carbon sequestration. Farmers in the study may be contributing more to ecological sustainability than they realize

c. Evidence from Case Study 3

Researcher: *When did you start practising the MFS and why?*

Farmer: *We started the MFS in 1995, with the main purpose of driving out hunger.*

Researcher: *What do you like about the MFS?*

Farmer: *One of the benefits is that we use kraal manure and ash, which we don't buy.*

¹³ In group interviews where it was easy to distinguish the contributor, I found it essential to identify the different members of the group. I applied this to groups of less than eight people.

Researcher: *Are there any other benefits?*

Farmer: *From the system itself, the kraal manure holds moisture which becomes available to the plant and then gives good yield. (Interview #L2)*

Researcher: *Okay, thank you very much. So maybe the first question is why did you decide to use the MFS in your farming practices?*

Farmer: *We chose the MFS because it is cheaper because we use organic manure not fertilizers. So that is why we prefer this one, that of Machobane. (Interview #L1)*

Helvetas (n.d.) noted that some of the strengths of MFS, which attract farmers, are the incorporation of cash crops and increased productivity through intensive inter-cropping. Similarly, Robertson (1994, pp. 102-103) pointed out that “The system that Machobane developed aimed to squeeze the largest and most reliable yield from the most limited available resources, by merging the cultivation of as many crops as time and space would permit.” Meanwhile, the need for water conserving strategies in agriculture has become more urgent with the increased frequency of droughts in Lesotho 1978. The longest drought in 200 years occurred between 1991 and 1995 (Chakela, 1999).

5.4.1.2 Farmers engage in sustainable agriculture to derive social benefits

Data from each case study shows that farmers adopted the various sustainable agricultural practices to benefit from the safer and more nutritious food that is produced under such conditions as the conversations below illustrate.

a. Evidence from Case Study 1

Farmer AB: *Permaculture also armed me with some facts which I could use to argue why I was doing production the way I was. For example, the value of taste in our produce, the connection between a healthy plant and ability to fight diseases – then there is the fact of organically produced food being healthy because it does not have chemicals.*

Farmer Mu: *We now grow new crops such as moringa [which is valued for high nutrition and mitigating the effects of HIV and AIDS]. (Interview #Z2)*

Although Permaculture as developed by Mollison did not have a strong social component, SCOPE adapted it to the social circumstances of Zimbabwe and later, southern Africa by adding holistic goal formation which is practised by stakeholders in a given area (PELUM, 1995; Nyika, 2001, 2002; SCOPE, 2004; SAFIRE & UNHCR, 2004; SCOPE homepage, 2009). Outlining this goal formation process SAFIRE and UNHCR (2004, p. 13) pointed out that goal formation is carried out by first defining all of the people, organisations and institutions connected to the land, then bringing stakeholder groups to a meeting at which their personal values and land uses and interests are discussed, what they want to produce or gain from the land, and their long-term vision for the land.

b. Evidence from case study 2

Researcher: *What motivated you to go into agriculture?*

Farmer: *Because I was interested in food growing from a health point of view. So I was into healthy food when I started 25 years ago. (Interview #SA5)*

Researcher: *What have you been growing, do you have fruit trees?*

Farmer: *I've got nice oranges, oranges that are organically grown, they are very good. I had a friend who was allergic to oranges, only the ones they bought from the shops ... that is your difference because organic and in organic [farming] you don't spray. (Interview #SA7)*

Farm worker: *Besides that I am getting salary I like gardening because lots of things I learn, we are not choosing chemicals because the chemical disease is not good for the people [who have] got AIDS, cancer like that so, in my life I like to teach more people (Interview #SA6).*

Researcher: *Are there other reasons why you like organic farming?*

Farmer: *Organic farming I think is keeping people to be healthy that is why (Interview #SA9).*

Similarly, Saruchera (2006, p. 10) pointed out that South Africa's Department of Health was "strongly interested in the potential of organic home gardens to assist those living with HIV/AIDS". GardenAfrica (2009, p. 3) argued that "FAO found that organically produced foods (which are less forced) contain higher levels of health promoting secondary compounds (vitamins) and anti-oxidants."

c. Evidence from Case Study 3

Researcher: *Now if you could compare the harvest which you were having before you started MFS and after, what would you say is the difference in terms of the harvest?*

Farmer: *The quality of the crop that they produce from the MFS is better, is higher and is better off than the conventional. Okay she says that in the past, the cabbage that was planted under fertilizers during summer cropping, when you cooked that particular crop of did not cook well but the one which has been fertilised with the Machobane fertilizers, you know, it cooks very well. (Interview #L6)*

Grandin (2001, p. 11) argued that "MFS farmers develop a natural trend of resources management and care for the land with future generations in mind as the communities appreciate the inherent value in land-based resources ... The pinnacle of MFS development is the individuals' sense of responsibility and maturity towards the greater community and therefore culture of the Basotho." Helvetas (n.d.) noted that some of the strengths of MFS were local ownership of technology, better health and food security; social values and solidarity.

The main objects of the sustainable agriculture farmer food production activity systems are using land resources, which include water, soil and its nutrients, air, micro-organisms and agricultural biodiversity: what needs to be considered is how these resources can be transformed into enough healthy food; viable income generation, cost saving; as well as provision of ecological services. This shows that the motives do cover the triple bottom line of economic, ecological and social sustainability. But having different motives between and

within individuals creates different emphases and therefore provides areas for potential contradictions within the practice.

5.4.2 Intrinsic motivations for learning and practising agriculture

The notion of the object of farming above sufficiently covers the extrinsic reasons that were given by farmers but does not cover the intrinsic, which are also important to know and understand. In the SCOPE and Isidore Organic case studies, farmers explained that they went into agriculture either because they had a passion for it or because they were brought up in farming families. For example, an organic farmer in Case Study 2 made the following points:

Researcher: How would you say you learnt organic farming? Who taught you? How did you learn? And what did you learn on your own?

Farmers: It was just the passion. It was the burning desire to farm organically come what may, if I needed to make another plan to pay for the cost of farming, I did it. I did not make it at the beginning but the passion to farm was ever there and it probably gave me an edge ever since.

Farmer: I have got somebody that has been working for me all this time and he has got land now. He would probably say farming is in his veins.

Researcher: When you say it is in the veins what do you mean? Do you mean that some people are born farmers or are brought up in farming families or something else, what do you mean?

Farmer: When they are born, they have a calling [all laugh] it is the only way I can describe it... Many commercial farmers now are doing it just purely for the money, it's like doctors are doing, practising medicine for the money. But some of us will do it no matter what happens... It is a different mentality as well [all laugh]. Interview # SA5

In Case Study 1, there were a number of instances that suggested that the propensity to learn agriculture was embedded in the histories of the individuals as the interview below illustrates:

Researcher: What motivated you to go into farming?

Farmer AB: I was born to a farmer. I grew up farming. I tried other jobs but found that they were not good for me so I returned to farming. I have been farming since the 1980s. (Interview #Z2)

In Case Study 3 striking evidence comes from the fact that the innovator of the MFS grew up in a farming family and started farming when he was about eight years old. Even when he had a relatively well-paying job at Moriija, he decided to leave it and return to farming (Machobane & Berold, 2003). Recalling his youth, Machobane pointed out, “My father was a sharecropper who used to plough for the Dutchman. In the farmer there were three or four spans of 14 oxen each. I used to pull ox ploughs all day, in fact I used to be in the fields until 11 o'clock at night. At eight years old!”



Figure 5.9: The kind of spans that Machobane used to ‘pull’ at eight years old

5.4.3 Conclusion on farmer objects learning and practising sustainable agriculture

The main conclusion here is that the learning and adoption of farming practices is driven by clear motives and that some of the motives are potentially contradictory. Using abductive analysis and drawing on Bourdieu’s theory of practice/habitus, it is possible to see the strategic logic behind the learning of a practice (see Section 1.7.2). The farmer’s story in Box 5.2 below also illustrates how farmers improvise when working with practice (Bourdieu, 1990). The intrinsic motives discussed are closely associated with Bourdieu’s theory of habitus (see Section 3.5). The effect of history on the learning and practice of present days as illustrated in Case Study 1 and Case Study 2, underscores how history can be used to explain the present as critical realists argue (Archer, 1998; see Section 3.6.2). From the data generated in the research it is clear that farmers in the three case studies who are pursuing different but related forms of sustainable agriculture, have basically the same motives and objects and they yield similar results. Their primary object is the land and its resources and the intended outcomes are the triple bottom line of ecological, economic, social (and health) sustainability but the emphases are different due to circumstances and histories. Many go into sustainable agriculture because they do not want to harm the environments and the health of consumers. They are committed to sustainable agriculture because it improves soil and water resources and agro-biodiversity as well as provides safe and nutritious food. They recognise that the activity of producing food has a direct effect on both the environment and the people who consume the food as well as the ecological services generated by the activity. But others are motivated into farming or remain in farming because of who they are – because of their cultural histories which are connected to land and to farming.

The box below (Box 5.2) illustrates the history of one farmer and shows how the different motives of sustainable agriculture – intrinsic and extrinsic – drove his adoption and practice of Permaculture at the same time as he was connected with traditional agriculture in his family.

Box 5.2 The history of Permaculture at my home – St Margaret Permaculture farmer

It started with my father in the 1970s for he was a farmer – a peasant farmer in fact. Since he was just interested in farming, it took him just a few years to live on farming as his source of income. I would like to point out that this farming I mentioned above was horticulture.

If you allow me to define it further that was pure organic farming which one would also define as Permaculture. To be honest, my father did not know that he was practising Permaculture. In all these years he never used chemicals in his farming. If he did, it was an experiment. He used cattle manure since he owned a large number herd of cattle. Goat manure and chicken manure was the common thing at one's home those days, hence sustainability was easy. He also used humus from the mountain (*mutsakwani*) and compost, both pit and heap to maintain soil fertility. Water was conserved through water harvesting trenches, contours, wells and observing traditional beliefs at spring waters, e.g. not using pots at water sources. Plantations of sugar cane and bananas were also used along or around water sources like [such as] rivers and springs to conserve water. He used draught power and a tiresome bucket-carrying method of watering. In some cases, trench flooding would ease the burden of watering.

It is very surprising but true to point out that in those years there were no serious plant diseases or pests. If they were there, then maybe the theory that „the healthier the soil, the healthier the plant, and the best yields“ can apply. The yields were very pleasing and encouraging but the market was very poor. The value of produce was underestimated resulting in low incomes.

My father passed away in 1980 resulting in us (brothers) inheriting the land. One would wonder what new era means but it is only a matter of young blood taking over with modernised ideas of farming ... We would intercrop and rotate different crops on the same piece of land about three times a year. The advanced technology of farming we had embarked on saw us producing bumper harvests. As a result, we managed to buy a five-horse power water pump and pipes, the watering system was improved. We also established nurseries and herbal gardens. At times plant diseases became rife and so we resorted to chemicals but just to a very low percentage (25 %). Another thing we introduced at the farm land is agro-forestry, water harvesting techniques and beekeeping.

As the proverb goes, „like father like son“, the land had proved to us a genuine source of income. All of us (brothers) managed to buy beasts, goats, domestic utensils, even paying *lobola* for our wives. If I go on to mention other small things like fowls, it would sound pompous. It is a marvel that during the drought years, we never ran out of food, instead we even provided some to the community. Most of the people in the community have also learnt from us, hence they are also sustaining themselves from the land. Through farming outreach programmes, we have received different NGOs and we have benefited from some of them e.g. Environment Africa which helped us establish an agro-processing centre for processing agro-products for sale. At one time we won the Zimplow National Award: two ox-drawn ploughs, one cultivator and four hoes. Another time we won the Environmental Award of 2005 from Environment Africa. In the end I would like to say all this farming business has marketed our works, particularly our name far across the country and even abroad. (February 2009)

5.5 WHY ARE SUSTAINABLE AGRICULTURE FACILITATORS LEARNING SUSTAINABILITY?

While the main purpose of this chapter and thesis is about farmer learning and practices, during the data gathering process I engaged with many sustainable agriculture facilitators whose learning interests became necessary to understand because they facilitate some of the

learning that happens among the farmers and their learning and approaches have some bearing on the farmers.

5.5.1 Extrinsic motivation

5.5.1.1 Promotion of human health and nutrition in response to HIV and AIDS

One of the most commonly articulated reasons for adopting sustainable agriculture practices was associated with achieving better human health through food that is more nutritious and safer to consume. Some of the details leading to this inference are discussed below.

a. Evidence from Case Study 1

Facilitator MY: *More recently, and in response to the HIV and AIDS pandemic, we introduced a nutrition garden for orphans. From it, we sell vegetables and the money is used for paying the orphans' school fees. SCOPE also bought two goats to the orphans' project. Each child has a chance to get a goat, which they can use to build small livestock in the family and serves as a potential source of income in future.*

Facilitator CM: *At an individual level, I saw the potential to benefit from new knowledge and when I started learning about it, I realised that there was so much to benefit ... I now know about herbs for healing and pest control, which saves money. (Interview #Z5)*

Facilitator: *The surrounding community has good access to herbs on the ground, which is important given the problems associated with AIDS and the low availability of drugs... In Permaculture, a farmer grows many different crops including maize but when they value they just look at maize yields and ignore the pumpkins, cow peas, sweet canes and other crops which may also have higher nutritional value. (Interview #Z3)*

Researcher: *What contextual factors have enabled the learning and practising of Permaculture?*

Facilitator: *Another helping factor has been the whole rise of nutrition-linked to HIV and AIDS. The pandemic is encouraging people to grow a diversity of foods and to use fewer chemicals for the production of healthy food for the sick. (Interview #Z4)*

b. Evidence from Case Study 2

Researcher: *What do you call the kind of farming that you promote?*

Facilitator: *Yaa, I will say it is organic... For me, what I see as the strength is the nutrition side of this especially working with people who are HIV positive and stuff like that. You'll find the nutrition part of it is really the main factor. (Interview #SA4)*

This motivation resonates with that of the Department of Agriculture discussed above (Saruchera, 2006).

c. Evidence from Case Study 3

Facilitator: *And the production from the field, without the use of chemicals, the food will be safe. So that would be the benefit for people who are into that while on the other hand building the soil for future generations, instead of exploiting. (Interview #L4)*

Facilitator: *We are actually emphasising as the MFS, especially with this feared disease HIV and AIDS, in conjunction with the Ministry of Health, that people should take nutritious food, fresh food and all that. They must produce without synthetic fertilizers. (Interview #L6)*

5.5.1.2 Promotion of sustainability and agrarian consciousness

a. Evidence from Case Study 1

Facilitator: *During that time, Andrea Mercier was looking at how Fambidzanai could be used in relation to Education with Production. I recommended that we offer Permaculture as the main theme at the Fambidzanai Training Centre. (Interview #Z4)*

Facilitator: *For me the most frustrating thing is when we go far to train farmers and never have an opportunity to follow up. I did this once recently when I taught a group of farmers in Mashonaland Central. There is no way of telling whether the learning is being applied. What could easily happen is that the farmers did not get something right and they practice it and it does not work. (Interview #Z3)*

Facilitator: *The course, which is on integrated land use design, is attended by pupils, community members, who are farmers and community leaders. After the course, the school often gets its seeds and other materials for the garden and the orchard from the surrounding community. The school and the community conduct look and learn visits together. The exchange of planting materials is continuous. (Interview #Z1)*

The reasons given by Permaculture facilitators as motives for engaging with Permaculture resonated with those advanced by SCOPE, which was formed to promote “sustainable land use of school and college grounds and homesteads in the surrounding communities” and the integration of ecological principles into the curriculum (Nyika, 2001, p. 125).

b. Evidence from Case Study 2

Facilitator/farmer: *My life's work is basically to propagate an agrarian consciousness and for me it is a remedy of everything that is out of balance. The agrarian side is the fundamental core issue of food security and survival but the impacts of achieving an agrarian consciousness in society will be incredibly profound and encourage hopefully a spiritual awakening in people, an awakening of brotherhood, sisterhood, a global consciousness... So I am looking at organic development at this point as being the development of the agrarian consciousness so that children that are born into this world now, like my own two children, can grow up in that environment of knowing and of understanding agriculture from an ecological point of view, not having to break down preconceived ideas ... that we are not separate from nature, that we are not here to reign supreme over ecological balance ... This means how are we going to teach small-scale farmers to farm on a large scale? It is our growth philosophy and what I am saying is if you really want to help small-scale farmers help them do what they are doing better and that comes down to tools, appropriate technology. What tools can make it better, not more technologically advanced, because that means they have to be serviced by the professional which gonna make the people less sustainable, less in power of their own production, because that means they have to be dependent, but what tools really are going to make them easier? (Interview #SA2)*

c. Evidence from Case Study 3

Facilitator: *I have written a proposal about indigenous knowledge, which I think, especially now that even in the Ministry they talk of our customs, our culture, I think if I can have a niche in that thought of theirs of having something, especially from Lesotho, from Africa, we*

could bring that in ... There is lack of wood ash ...But the main thing is that people are not using wood any more.

Researcher: *For energy?*

Facilitator: *For energy. So there is a shortage of that, especially in towns.*

Researcher: *So what is the replacement, the substitute for wood ash in MFS?*

Facilitator: *Yes, now you come to the substitute. That is why I am working on these three substitutes, organic matter that we are doing now – solely to cover the shortage of kraal manure and wood ash. So that people continue using organic methods of [production]. And you see it seems to be working, at least here where we are researching on it. (Interview #L6)*

5.5.1.2 Promotion of community resilience

Data generated from document analysis and interviews across the case studies suggested that building community resilience so that they could better cope with livelihood challenges was one of the reasons for which sustainable agricultural practices were being adopted.

a. Evidence from Case Study 1

Facilitator: *Schools are the best entry point for Permaculture because there is land, erosion, bare soil... The school can then become the learning point, the seeding point for the surrounding community, allowing for the local spreading of the practice. (Interview Z4)*

Nyika (2002) pointed out that SCOPE was developed to address land degradation in schools and surrounding communities. Commenting on the successful application of Permaculture principles to improve the school environments, Wilson (2008) noted:

The success of St. Vincent's in transforming its landscape led to a programme with over 200 schools and the desire by the Ministry of Education to implement this process all over the country... We then did a visioning exercise to look at what the school community wanted the school to look like, to be like. We used the holistic goal formation process to do this, a thorough process that starts with „what we value as a school community“. Part of this holistic goal process was to describe how the landscape should look far into the future. (pp. 1-3)

b. Evidence from Case Study 2

Facilitator/farmer: *The thing that I propose, that I feel would help them most, in organic development is that the NGOs need to be employed to go into the areas, identify the people that are growing regardless of information or help. Those are agrarian minded people that are growing there. Those people need to have their door knocked on, and said, "Sawubona [Hello], we can see what you are doing. We value you as a member of your community. The information that you have on agriculture in this region is invaluable to our plans of the future and we want to work in collaboration with you to develop sustainable methods of agriculture for the region." And pump that guy with support, give him a water tank, do the training at his place and let the trainees dig swales for him to develop his infrastructure. Give him different varieties of fruit trees to increase his diversity... But what a surprise when winter comes and Mr Dlamini's truck is still leaving his farm full for the market every morning. That is going to have social impact. (Interview #SA2)*

c. Evidence from Case Study 3

Facilitator: *I think RSDA went into the MFS because, since we are promoting self-help, we were looking for any good practice that we can get which farmers can do to improve their*

land, making it productive so that is how we came across Machobane ...There is another thing that is called matsema – collective working in the villages. For example, during harvest time, people, local people help each other. We go to your field and then once we are through with your field, we go to another field. Yes, they call it matsema. That also is incorporated in the MFS and helping each other, „you have been helped, so help others too“. Yes, that is the policy of the MFS. (Interview L#5)

Facilitator: For people who are not maximising the seasons, just planting one crop... If it fails, it fails. If there is drought you are going to fail, if there is hail you are going to fail but if they intercrop like that on a rotational basis, at least they will be able to harvest two of the crops. (Interview #L6)

5.5.2 Conclusions on facilitator motivation for learning sustainable agriculture

As shown in the discussion and evidence above, the main object of facilitators is people who want to learn about sustainable agriculture in order to increase their consciousness about different forms of sustainability, and enhance their knowledge and skills. Their other object is to influence the education system, including but not limited to the school curriculum in order to make it more inclusive of sustainable agriculture. Finally facilitators also aim at promoting community resilient communities, to build their ability to adapt to changing contextual conditions – that is to enhance agency for adaptation and resilience. These findings about the role and qualities of a sustainable agriculture facilitator resonate with recommendations made by the International Institute of Rural Reconstruction (IIRR) in connection with farmer promoters:

Farmer promoters assume many roles and may participate in many activities. Their principal functions are to promote community self-reliance and organisation, as well as to conduct research, experimentation, validation and dissemination of technologies which aim to improve the quality of life of rural communities. (Selener et al., 1997, p. 11)

Using CHAT, the primary object of sustainable agriculture facilitators interviewed in the three case studies are people, particularly farmers. The intended outcome of the work of sustainable agriculture facilitators in all case studies is farmers who have skills, knowledge and attitudes to produce enough (for themselves and the community and society at large), safe and nutritious food in a way that improves the health of people and the environment for current and future generations. The primary overlap in the activity system of farmers and sustainable agriculture facilitators is that the object of the farmers is the intended outcome of the facilitators. At the same time personal interest, which was not determined by external factors, attracted some facilitators into the sector. Their responses also show that facilitators are mediators of learning that farmers do. The responsiveness of facilitators to contemporary issues that were being experienced in their different areas suggests the social-situatedness of their approach to facilitating learning, which is in line with social learning theory (see Section 2.3.5) which as Pretty (2002) and Wals (2007) noted, fosters innovation and adaptation.

5.6 HOW ARE FARMERS LEARNING SUSTAINABLE AGRICULTURE?

The interventionist nature of the research compelled me to understand past and contemporary influences on the learning processes so as to find ways of expanding it in subsequent phases of the research process. This section is devoted to that analysis using CHAT concepts of learning to illuminate learning, because this has potential to enable CHAT-based concepts of intervention and expansive learning, as discussed in Chapter 3. The three main kinds of learning which were also discussed in Section 1.7.1 are firstly, scaffolding where a learner is helped by a more knowledgeable other to grasp a new concept and move across the zone of proximal development. The second kind of learning happens when the learner is able to link everyday knowledge with scientific knowledge leading to mature concepts and this kind of learning is cultural. The third kind of learning happens when a group of people with different perspectives and funds of knowledge work jointly together to define a zone of proximal development and collectively move across it. This is a collectivist interpretation of learning. Internalisation and externalisation form an important part of learning, especially in the latter case but is limited in scaffolding.

5.6.1 Farmers learn through scaffolding and mediating tools that link their knowledge to scientific knowledge

The conversations below illustrate how farmers described how they learn through scaffolding. The kind of learning appears common throughout the three case studies.

Farmer Mu: *I have also learnt from and through NGOs and AREX [Agricultural research and extension officers]*

Farmer AB: *Personally I attended a one-week Permaculture course and learnt about maintaining soil fertility; the primacy of soil in production. I also learnt about cropping patterns and the seasonality of certain things. I learnt about companion planting too, the plants that grow together well and those that do not. In fact, some of the things that were taught I already knew about but it was good to have someone confirming that they made sense, that they were right. (Interview #Z2)*

Chiotha (2005, p. 9) defined the interaction of local knowledge with scientific knowledge which confirms the former as „reinforcing interaction“.

Facilitator/farmer: *As farmers we also learn from attending workshops. About 20 farmers have established nutrition gardens as a result of attending workshops on the same earlier this year (Interview # Z3).*

In the above two statements, workshops, and concepts such as „the primacy of soil in [agricultural] production“ were used as mediating tools to facilitate farmer learning. Training workshops within SCOPE are generally designed in a participatory learning framework (SCOPE, 2004). The concepts of companion planting can also be historically traced to local

and traditional practices and therefore provided a good way of connecting with what the farmers were familiar with.

Other farmers, such as one interviewed in South Africa, who have had no prior background in farming, acquire formal and western knowledge and use it as their sole basis for practising agriculture. But the interview also shows how central the concept of marketing, which is linked to economic sustainability, is being explicitly promoted in organic agriculture.

Researcher: *How did you learn organic farming?*

Farmer: *Oh, we was [were] learning at the Land Care Foundation, about organic farming at NQF level 2 and NQF Level 5.*

Researcher: *What you were taught?*

Farmer: *Okay brother, we were learning about quality management and marketing strategies I remember I was learning about all here.*

Researcher: *In agriculture what did you learn? What did you remember learning about agriculture?*

Researcher: *To agriculture was learning about a crop rotation and swales to stop the soil erosion and soil preparation (Interview #SA9).*

Literacy and language have been identified as challenges in mediating farmer learning as Cooper noted about small-scale farmers in KwaZulu-Natal in South Africa, the province in which Case Study 2 was located. He noted “introducing smallholder farmers to producing food organically, using ecological methods, is not an easy task as families are large, farmers tend to lack formal education and many have been poor for so long that motivation is a problem” (Cooper, 2002, p. 13).

In some cases the link with western and scientific knowledge is used by farmers to validate their practice. If there is a dissonance between what they know and what the western science tells them, they are often inclined to drop the new practice that might have been working as the interview below illustrates.

Facilitator/Farmer: *Sometimes we are in doubt about certain things and that is when we need some form of support, confirmation, evidence. And when this does not come, we go back into our old ways of doing things. (Interview #Z3)*

Vertical learning, also associated with scaffolding, takes place when farmers learn from facilitators, extension workers and tutors, and is often associated with the acquisition of formal knowledge from western science. Farmers in the study indicated that they acquired such knowledge through attending workshops and reading books and other forms of learning materials. What was striking about the value of this kind of learning was that it was associated with providing explanatory power – the power that resides in certain forms of mediation, sometimes to things that were already common knowledge. Sometimes the

meeting of local and scientific knowledge is used to reach new levels of understanding. It is interesting to note here that scaffolding seems to take place at the same time as the linking of lay and scientific knowledge. This is also beginning to define what farmers perceive as agricultural cognition (see Sections 8.4.1 and 9.2.4 where this is discussed in more depth).

5.6.2 Farmers learn from fellow farmers

The study revealed that in addition to vertical learning among farmers, there is also horizontal learning through intergenerational passing on of knowledge through families. The latter suggests the cultural-historical nature of learning. This is supported by the following conversations drawn from the three case studies:

Researcher: *How did you learn [Permaculture]?*

Farmer AB: *So to answer your question, we learnt from our parents. We also learn from fellow farmers. An important learning place is the market, where we sell our produce. This could be at the provincial town in Marondera or in the capital city Harare. When I admire the produce from another farmer, I approach him and ask a few questions. This is how I learn about things from other farmers.*

Farmer Mu: *We also learn from each other here on the farm, as well as from other farmers in the area.*

Farmer FC: *We learn from our husbands.*

Farmer Mu: *Our children learn by watching, copying and comparing. (Interview #Z2)*

Researcher: *How were you taught? How did you get to know how to plant vegetables?*

Farmer: *Mr Arthur of Kloof, the white man organised Brett to come to us, to teach us how to cultivate the soil. He took us to his farm.*

Researcher: *And you saw what he was doing there?*

Farmer: *Yes, he demonstrated that to us. When we came back to our garden, he also demonstrated it to us at our garden. (Interview #SA3)*

Researcher: *As a farmer, how do you learn with and from farmers in your area?*

Facilitator/farmer: *We do field days annually where the best farmer hosts other farmers and explains their successes. Some farmers in the villages who had cassava plants but did not pay much attention to them started doing so after I had shared my experience. (Interview #Z3)*

Farmers who ask tend to gain more relevant information to their needs as illustrated by this point made by a female farmer/entrepreneur in South Africa:

Farmer/entrepreneur: *I also find that you can only learn as much as what you can really want to ask ... but sometimes you can get information overloaded and become so much you don't even know anymore where to put it in your brain. The best thing is just to start and ask question pertaining to what you have done ... The best way to get further as far as information is concerned is if in your area for example, go and look at those gardens that are doing well, go and see what have they got planted, what plant have they got in and why is it that day are doing well. And it is probably be a little old gogo [grandmother] who has collected her seed who keeps going, who knows exactly the times, the things have be to planted. Go and ask there. (Interview #SA1)*

Sometimes there is direct connection between vertical and horizontal learning, where farmers are sent to learn from formal settings and when they return home, they share this knowledge and these skills with fellow farmers as one group of farmers in Lesotho highlighted:

Researcher: *How about the learning part of it? How do they learn how to double-dig, or to add manure or ash who teaches them?*

Farmer group: *We take responsibility of teaching the others.*

Researcher: *What kinds of things do you do together as a group and what kind of things you do separately as families or as individuals?*

Farmer group: *As a group we work together, in terms of, when we control pests from the fields. We work together, we share medicines. Even when we are supposed to pay for somebody who is going for training, we collect money and he will bring information back to us. (Interview #L1)*

From the above conversations, there are suggestions that questions, observation, experience sharing and demonstrations are used to mediate farmer learning in the case studies under review. Horizontal learning seems to involve the sharing of everyday and scientific knowledge. The manner in which the knowledge is shared seems to be dealing with problems and issues that people may be facing and not so much focused on the future. The horizontal learning also seems to be ad hoc and not structured and this may be partly because of the nature of the workplace of farmers (fields, gardens, homesteads and grazing lands) that are often separate from one another. In a sense, we see from evidence in the case studies that farmer to farmer learning can entail scaffolding, mediating tools and cultural learning. Vertical learning is often associated with instances where there is a gradient of knowledge and the more knowledgeable person, uses a kind of ladder to help the novice to move to the next level of understanding. Horizontal learning entails mutual learning. Both concepts are discussed in the zone of proximal development (see Sections 1.7.1 and 3.6.1).

5.6.3 Learning through observation, practice and experimentation

Another commonly found form of learning was concerned with learning through practice (see Section 1.7.2). This can be seen as being mainly concerned with how the individual uses knowledge that has been internalised and appropriated to externalise it by working on an object (see Section 3.4). Interviews conducted during research illustrate this point through the conversations cited below:

Researcher: *You talked earlier on about the importance of observation, can you explain this?*

Facilitator/farmer: *Sure. Observing your farm, spending time in your farm, observing simple things like, which way does the wind come from, which way does your weather come from, where do storms come from? How does the aspect of your garden affect the sunlight between summer and winter? Some place in the garden will have full sun in summer but in winter will have no sun... The other observation is observing the plants themselves. How are they interacting or reacting to the situation that they are in. If you plant broccoli and notice that*

there are a lot of aphids, then you may observe then that there are not enough ladybirds and then you try and create a habitat for them. (Interview #SA2)

Observation has also been highlighted as an important stimulant of learning:

Researcher: Apart from learning from each other as farmers and from extension workers, do you learn on your own? Have you felt that you have discovered something new, no matter how small?

Farmer AB: I do trials and monitor all the time. When productivity declines, I look for reasons. Could it have been the spacing, the timing, the variety or inadequate manure? This makes me change and improve next time. (Interview #Z2)

But observation means more than seeing what is there. It means understanding what is behind what is visible, as one farmer/facilitator pointed out:

Facilitator/farmer: If you have a rodent problem and see that your mealies are getting eaten, you could observe that the rat is the problem and you could put poison for the rat. What is that gonna do? It is gonna kill the rat but what is the rat's predator? The rat's predator is an owl. If you poison the one rat, the problem in the first place was that there were not enough owls, that is why there is too many rats. So by poisoning the rat, you are worsening the problem, poisoning the owl. So this kind of ecological understanding, of observation of the web, of the interaction between everything in the system makes you see that nothing is an enemy. It might be in the wrong place. (Interview #SA2)

Farmers have been making some notable improvements in their sustainable agriculture practices. Some of them are concerned with design and others with reducing labour intensiveness. This discussion with a group of farmers in Lesotho illustrates some of the incremental improvements that they have been making in the system, which is a form of learning:

Researcher: Are there any experiments or innovations that some of the farmers have done when they are practising the MFS?

Farmer Group: Yes, there have been experiments.

Researcher: Okay, can we have examples of which ones were tried and what the results were?

Farmer Group: When we were taught how to plant, we were taught that the space between the potatoes, you have to measure it, and then to measure it you have to bend down. And then we felt that we cannot manage anymore because of backache and then we just size with some hoes so as to make it easy and simpler, so that we don't bend down every time we planted [interviewer laughs], especially the sowing of potatoes.

Researcher: Aaah that's good, any other innovations?

Farmer Group: To cut on the labour-intensiveness of the system, when you plant potatoes also you have to dig the holes with a spade, you are supposed to do that as recommended in the system but we saw that it is difficult and it takes time. Then we use strings to mark the lines and then we use the mono-plough to open up furrow so that we can put potatoes and cover the soil [interviewer laughs]. Instead of digging the holes, we just open up the furrows using animals. (Interview #L1)

Deliberate experimentation to gain crop-raising specific knowledge is one method used by farmers to learn and improve their sustainable agriculture practices, as one farmer notes in the conversation below:

Researcher: *Who taught you?*

Farmer: *Well I learnt by speaking to other farmers and by making mistakes.*

Researcher: *What are some of the mistakes that you made and corrected?*

Farmer: *Well it is very critical to know what varieties of crops to plant during different times of the year. So you know certain varieties of carrots will do well here, others not. So those are the kinds of things that are very, very important, basically what crops will pick up problems during different times of the year. (Interview #SA5)*

A study conducted by Institute of Natural Resources organic farming in South Africa concluded that skills development of both organic farmers and trainers was imperative through the Agriculture Sector Education and Skills Training Authority. It also recommended introduction and expansion of the agricultural sciences at schools as well as to develop degrees in organic agriculture and support research in organic farming, which is carried out on farms (Institute of Natural Resources, 2008). These recommendations have big implications for time (see Section 5.9.3).

Learning through practice, which is mediated by „sayings and doings“, by experiencing (Green, 2009) means applying what might have been learnt elsewhere as well as experimenting with new ideas that may improve the practice. It means using conceptual tools already internalised to work on understanding new situations, that is, reflexivity. This kind of learning appears difficult to fit in under any of the three categories discussed earlier although it has potential to contribute to collective learning, which is also called expansive learning (see Sections 3.6.1 and 3.6.5).

5.6.4 Conclusion on how farmers learn

Farmers involved in the three case studies investigated generally learn through experiencing and doing. This means that, through practical learning, they acquire tacit knowledge, which is difficult to put in words but can be learnt through observation and doing. Koskinen (2003) noted that tacit knowledge can be externalised through expressing the „inexpressible“ through figurative language and symbolism such as metaphor (see Sections 8.2.5.6; 8.2.7.6 and 8.3.3.3). Metaphors are used by individuals in different situations and contexts to understand something intuitively through the use of imagination and symbols.

A practical approach seems suitable because many of the farmers are not highly literate, which makes formal instruction difficult. Gamble (2006, p. 89) noted that there are two ways of viewing knowledge: knowledge that is context-dependent and generated in the course of human action – practical knowledge; and knowledge that is context-independent generated in a context of thought – theoretical and conceptual knowledge. Context-independent, that is, abstract or theoretical knowledge, is reached through two main methods; deductive and inductive. Deductive conclusions move from whole to parts (*principles*) while inductive reasoning moves from parts to whole (*procedural*) (Gamble, 2006, pp. 89-90). It appears that the dominant mediating methods for farmer learning were associated with practical knowledge, which Gamble pointed out also carries tacit knowledge, which cannot be put into words but is nevertheless acted upon (*ibid.*, p. 93). Permaculture facilitator learning on the other hand appeared to have a stronger inclusion of context-independent knowledge. The advantage of context-independent knowledge is that it provides the capacity to solve problems in a wide range of contexts, which makes the knowledge portable (*ibid.*, p. 98). Gamble (2006, p. 94) further noted that for vocational education to be effective, it must carry both the general (theory) and the particular (practice). Farmer learning did include conceptual materials and from this perspective could be considered to be addressing both dimensions but not with the same emphasis on theory as facilitator learning.

The danger of this approach (see Section 4.2.1) is that the farmers may continue to receive knowledge on the *profane* and not the *sacred*, practice without theory (Durkheim, 1961 and Bernstein, 1999). This approach can lead to reproduction and not transformation. Dean (2006) noted that everyday knowledge – also called commonsense knowledge or „knowing how“ – is not enough in present day capitalist society; it needs to be augmented by science, meaning „knowing that“. One of the central limitations of current farmer learning processes is that there is no mechanism for continuous and collective learning centred on the dynamic interests and needs of the farmers. Whereas traditionally such mechanisms were present, they were disrupted by conventional, top-down, research-design-develop-disseminate approach models of research and extension, which reduced farmers to consumers of knowledge (see Sections 2.4 and 2.5.1). While in principle all three sustainable agriculture practices urge collective learning, in each of the three cases studies, this remains ad hoc. This is amply captured in the conversation below:

Researcher: *What can be done to improve learning of Permaculture among farmers?*

Facilitator: *One of the keys is to try and get farmer education happening among farmers on a continuous basis. Farmers need to have their own study groups. (Interview #Z4)*

From the above it is clear that improving farmer learning will mean doing something about the context in which their learning takes place – the ecologies of knowledge (see Section

2.5.5). The second important point that can be drawn from the learning of farmers in these three case studies is that mediating tools are important to facilitate learning. Some mediating tools are good for sharing explicit knowledge and these include books; others are good for communicating tacit knowledge and these include demonstrations, look and learn visits and experimentation. Another critical dimension of mediation is language, which needs to be accessible to the learners in order for it to carry meaning. The use of local language is particularly central in the SCOPE and Isidore case studies, while research and documentation were a central issue in the MFS. Structures to ensure continuous farmer learning remain central and this will be pursued later in the study (see Sections 9.4.7 and 10.2.4.2). While there are several individual farmers generating innovations, there are not enough mechanisms to find these out, test them further and disseminate them to other farmers (Mukute, 2006). In addition, there aren't adequate mechanisms for farmers to share their problems and jointly look for solutions, inviting expertise from relevant quarters where necessary (see Section 5.6). This will also be pursued in the study. The next subsection of this chapter discusses factors that are shaping how farmers learn because an understanding of this will help in the design of more effective learning interventions. This is concerned with the idea of ecologies of learning discussed above.

5.7 FACTORS THAT SHAPE HOW FARMERS LEARN

The study went beyond identifying existent farmer learning processes (see Section 5.6 above) to examine the factors that shape their learning. This seemed essential because the research had an interest to change things on the ground and any meaningful intervention or recommendations needed to take into account the broader contextual factors within which the learning happens (see Chapter 2) in order to fully understand the cultural historical influences on sustainable agricultural practices and change oriented learning and associated causal mechanisms.

5.7.1 Time and space configurations

In analysing case data, time was identified as one of the most central elements determining the quality of learning by both farmers and sustainable agriculture facilitators. The various dimensions are discussed and summarised below.

5.7.1.1 Time is needed to master a practice

The respondents in all three case studies indicated that farmers need time to learn and master a practice. If time is too little, there is also little learning that happens, and consequently the development of the practice is stunted. It is five years before a farmer trained in MFS may be awarded a certificate of recognition. Underpinning this length of time is the understanding that the farmer needs to have mastered and appropriated the necessary knowledge and skills in ways that enable practice. This suggests that the MFS tutors and promoters realised the

need to invest a great amount of time in order to generate the necessary quality of input and outcomes. One of the facilitators points out below:

Facilitator: *So we are saying in five years "time, the soil will have improved so that would be the basis. That was the basis. Then you find that after five years if we started with 100 [farmer learners] you find that we have 50 or 60. And then those 50 will get certificates, saying you have completed five years of competence in this farming system. (Interview #L4)*

The value of „long-term“ training in building a practice is also underlined by a Permaculture facilitator in Zimbabwe:

Facilitator: *Permaculture is new and it takes time to develop skills to manage diversity. Two weeks is not enough. This is why we developed the idea of an apprenticeship programmes where people learnt and implemented Permaculture for a period of two years. (Interview #Z4)*

Most of the initial training of people in farming takes a mere three days to one week and there is little follow-up to complement this.

Facilitator CM: *Time limitations mean that we cannot cover some topics adequately. The topic that suffers most is often „know your elements“. There is so much that has to be shared on this topic... Then when it comes to herbs, there are so many of them, with so many functions. We can only cover so many during the week. (Interview #Z5)*

Researcher: *How long does the training take?*

Facilitator: *Two to three days. (Interview SA#8)*

The concerns were also raised in Lesotho concerning MFS learning by trainers who end up teaching farmers „half-baked truths“ as an MFS promoter notes:

Researcher: *What are the common errors, discrepancies that you have noticed?*

Facilitator: *For example I went to do a study for ... as a consultant there to see how they were teaching. They teach MFS, they train people but I found that they were not doing the right thing.*

Researcher: *And why do you think that is the case? Why are people experiencing that?*

Facilitator: *They are experiencing that because they do not know very well the MFS. Or maybe they read it in the papers that we were ... about the MFS. (Interview #L6)*

Another example of concerns about the inadequacy of current training in the sustainable agriculture sector was raised in South Africa as this interviewee suggests:

Researcher: *How long were the courses and how many did you attend?*

Facilitator: *I first attended the two weeks course and then after that I attended a facilitator course, organic facilitator course which ran for about nine months if I am not mistaken.*

Researcher: *Nine months?*

Facilitator: *It was NQF level 5.*

Researcher: *What is your feeling on it for your training?*

Facilitator: *I still want to know more things about organic farming and when I am not sure about things I tend to refer some of our people some of our patient to X [an officially approved trainer] so he does give them some skills and I also try to give them some skills and help them out.*

Discussing the importance of time in training farmer promoters, Selener et al. (1997) pointed out:

„Formal education“ is not a necessary requirement for being a farmer promoter. More important attributes are credibility, community acceptance, and a positive attitude to take on the challenges of a farmer promoter. Farmer promoters are not born but made, step by step; therefore, to yield effective results, the necessary time must be given to allow an *evolutionary* formation process to take place [in the development of the farmer promoter] [my emphasis]. (p. 10)

The data from these discussions shows that three-day training, two-week training or even nine-months training is felt to be inadequate to learn and master a practice. However, the 24 months Permaculture „internship“ conducted in Zimbabwe and the five-year farmer training under the MFS system appeared to produce better results.

5.7.1.2 Time to change attitudes

It takes time to change perceptions and attitudes regarding sustainable agricultural practice, especially when there are competing interests negative perceptions. The building of a new practice needs even more time because a new consciousness has to be developed. This is particularly important in situations where the practice may be stigmatised as is the case with organic farming and other sustainable agriculture practices. The agricultural profession is not seen as „mental sport“ in South Africa and Lesotho, especially by communities that have been, are and want to move away from being seen as rural and agrarian to being modern and industrialised. The situation is even worse for sustainable agriculture which is seen as taking people backwards supposedly because it does not take full advantage of scientific and technological development. Youths are less interested in pursuing agricultural studies because agriculture is not seen as „cool“, „sexy“ or modern, especially organic farming and other forms of sustainable agriculture. Some parents share a similar attitude towards farming and prefer to buy rather than produce, as one graduate was reported to have said at a PELUM Food Sovereignty workshop.

Farmer/facilitator: *That story of the black woman that got a successful job and was taking food back to the family and the family stopped growing vegetables. That needs to be told. That story was so powerful. (Interview #SA2)*

Fellow farmers have also been using peer pressure to belittle organic farming as one farmer recalled:

Farmer: *I was the first organic farmer in Natal. And other farmers, they laughed at me. (Interview #SA5)*

The developed world went through the agricultural revolution before their industrial revolution and developing countries are generally agrarian and not fully industrialised. So there is a general perception that an economy's advancement is judged according to how industrialised and (the less agrarian the better). Organic, with its lower reliance on biotechnological advancement – such as not using chemical pesticides and fertilizers, or Genetically Modified Organisms – is seen as backward. This gives sustainable agriculture two-layered stigmatisation, which I have called double stigmatisation¹⁴. An interviewee in the study captured the point succinctly when he said:

Farmer/facilitator: *One of the largest stumbling blocks I have come across in working with trying to train people in small-scale agricultural development is the negative effect of the education system of apartheid years where if you were clever you went to a normal school, and if you weren't so clever but were good with hands, you went to a technical school and if you weren't good with your mind or hands, you went to agriculture. There is a stigma attached to agriculture that prevents our society to the core, where especially people who in the last two three decades, a lot of people got uplifted from agriculture areas into urban and have finally got a job through much hardships and much perseverance in the commercial sector. To hear that his son wants to do agriculture is like a knife in the heart. (Interview #SA2)*

As such, it is important to have a longer time frame for building such consciousness, even beyond this generation as one interviewee argued:

Farmer/facilitator: *Look at the development of organic development beyond government terms of office, beyond now, but far into the future generations. Success of organic development should be judged against a longer time frame. So my personal belief and understanding, I got to a point where I am no longer happy to work with a group over six months or a group over two years or even a group over ten years. I have removed myself, my thinking and my success fallacy from that time line altogether. I am looking at it now over generations. (Interview #SA2)*

New structures that support new practices have to be developed and elaborated so that children may grow in them and internalise them from when they are very young. This will help deal with the current negative attitude towards agriculture, which has been developed

¹⁴ Double stigmatisation is a word coined by the researcher in this study to refer to the two layers of rejection of sustainable agriculture. The first layer relates to people not wanting to pursue agricultural studies and practices in general; and the second is concerned with even fewer people wanting to do sustainable agriculture because some of its aspects are seen as primitive or backward compared to conventional agriculture.

over generations (Robertson, 1994; Eicher & Rukuni, 1994) as civilisations moved from being agrarian based to industrial as this conversation reveals:

Facilitator/farmer: So I am looking at organic development at this point as being the development of the agrarian consciousness so that children that are born into this world now, like my own two children can grow up in that environment of knowing and of understanding agriculture from an ecological point of view, not having to break down preconceived ideas, not having to culture a realisation of the importance but these need to be fundamental knowings within people from the time that they were born. (Interview#SA2)

The stigmatisation of agriculture and double stigmatisation of sustainable agriculture were also evident in Case Study 3 and Case Study 2. This can be partly explained by the significance of gold and diamond mining in South Africa, for which labour had to be drawn from former farmers (van Onselen, 1996). In Case Study 1 the significance of mining fell when Rhodes and the Pioneer Column failed to find the mining resources that they needed and had to resort to agriculture (Murwira et al., p. 12). At one level, there is a growing and general disinterest in agriculture in Lesotho, which may be part of the reason why the per capita agricultural production in the country has fallen to a third in two decades from 180 kg in 1974 to 60 kg in 1994 (Mosenene, 2000). Mosenene (2003, p. 4) quoted Machobane as having said, “The introduction of western education to this country taught children that farming was something dirty and primitive.” The second layer of stigmatisation of agriculture takes place in the MFS because it is perceived as backwards, as two MFS facilitators noted below:

Facilitator: Before I went to Bulgaria, there was a general impression given to us by the powers that be, yes, the government – that the MFS was primitive ... „This man was sending us back to where we came from“ [both laugh]. So my impression, although it was not well-founded, it was just what we heard from government, the officials, and the extension officers then. They were so much against it that we were not, even the teachers, were not allowed to talk about it at school. It was almost like a crime ... So I had that impression that this man was sending us back to where we came from 100 years ago. (Interview #L6)

Facilitator: I think, Lesotho, because is close to South Africa, the agriculture here is mechanised. If you are still talking about draught power, the hand hoe, it is something that people think that you are taking them backwards. (Interview #L5)

5.7.1.3 It takes time to build soil ecology

The other important dimension of time and space is that it takes time to build the soil, and the poorer the soil, the longer the period needed. There are no short cuts to developing the soil ecology as these two interviewees illustrate:

Farmer: As I said the land was a desert and my grandmother gave it to her children, she had nine children. Each child got seven acres and we started on my mothers” seven acres. The fire had destroyed all the goodness; it was a desert so we tried this and that and couldn”t get

going... It was dead. It was dead and took me several years to get life into it through organic mulching, lots of grass, lots of grass. (Interview #SA5)

Entrepreneur/farmer: I would have to say a biggest obstacle would be trying to convert organic farming into a financial sustainable project into short time. We also at the beginning thought we will do like quick, quick but it wasn't going to work. What we found working was networking with other farmers... We have been building up our own farm all this time we've been doing a lot of soil feeding and all of that at the beginning we did try quickly to make a profit overnight, quickly putting in crops and harvesting but we encountered many difficulties with that because our farm infrastructure wasn't ready. (Interview SA#1)

Nielsen (1994, p. 31), writing on the experiences of the Peasant to Peasant movement of Nicaragua and which practised sustainable agriculture concluded that it takes 5-6 years to establish good topsoil.

5.7.1.4 It takes time to build agro-biodiversity

In practice, time is needed to build and manage agro-biodiversity in a locality (physical space) in the garden, the homestead or field. For example, the pest-predator populations need to be balanced to control production losses from pests and it will take a number of seasons to achieve this in many areas. Time is also important for one to understand not only the different elements in the agro-ecosystem but also how they relate with one another.

Facilitator: It is difficult to put Permaculture into practice because it takes time for people to get hold of it, to have the confidence to put it into practice. Confidence comes from doing things again and again. The danger is that you could fall in love with the theoretical concept, and not practice it. The theory is appealing. It's nice and neat. Besides, you can only have as much diversity as you have learnt to manage. It is a skill to manage diversity. Some people try to put in too much diversity too soon. It needs more training than two weeks (Interview #Z4).

But the kind of agro-biodiversity, which takes time to build, comes with improvements in other spheres of the farm and farming. One of the important dimensions is the creation of necessary habitats for desired plant and animal species as suggested in the conversation below. Habitat has special spatial dimensions:

Facilitator/farmer: And by creating these types of habitats, you ensure the survival of species, like for instance if you have got a problem with snails, it means not that there are too many snails, there are not enough frogs. How do you attract frogs into your garden? Do you have a pond? Do you have a water source of any kind? No. Maybe then it's worthwhile to dig a small pond. You know, create the habitat. For the predators, we use a lot of logs on the edges of our beds. You know you will see a lot of wood lying around in the garden that is a habitat for the small brown lizard that eats lots of small bugs and beetles that eat holes in leaves. And they are all over. They breed all over. They are very active. So this is ecological farming. (Interview #SA2)

SAFIRE and UNHCR (2004, p. 3) noted that Permaculture as a sustainable agriculture practice promotes biological diversity through techniques such as agro-forestry and

intercropping. Similar arguments have been made in favour of MFS (Robertson, 1994, Grandin, 2001; Mosenene, 2002) as well as about Organic farming (Saruchera, 2006; Auerbach, 2009a). Figure 5.10 below shows some of the diversity being propagated by farmers who took part in the study.



Figure 5.10: Diversity in sustainable agricultural practices: portions of Isidore (left) and St Margaret farmers gardens (right)

5.7.1.5 In organic farming, it takes time to convert conventional farmland to organic

In organic farming, there are other important time and space dimensions. If the area in question has been under conventional farming, there is a changeover period which must be observed before the land qualifies for organic production. This is to allow for the decay of chemicals that might be on the land. The fields in which organic produce may be certified should be a certain minimum distance from fields in which conventional farming is being practised. This is especially important where cross-pollination is possible. In general, it takes at least two years and as many as five, for one to become a certified organic producer. Wilson (2002) concluded that:

If farmers are making a transition from using chemicals to growing the cotton organically, there is likely to be a significant fall in yield. It is significant in that it is also likely to mean less income for the farmers in the first [few] years. It is only when they have increased their skills in growing organically (after around three years it appears) that this income might start to compete with conventionally grown cotton. (p. 32)

Rundren (1998) noted that it takes about four years for a certification programme to be established nationally and this begins with bringing together interested parties and building consensus in the beginning, to setting the standards, registration of the organisation, employment of certifiers, development of the necessary symbol for certification, to revision of standards and acquisition of IFOAM accreditation. The conversion period therefore not also takes time but also costs money.

5.7.1.6 Time is needed to produce ecological services

This study has also revealed that it takes time for sustainable agriculture to achieve some of its goals of producing ecological services. For example, it takes time to recharge water tables and make the results visible. This statement by a Permaculture facilitator underscores the value of time in developing and mastering a practice:

Facilitator: The main challenge is that it takes time for the results to show. Farmers are used to quick results and conventional farming is very good at that. Permaculture feeds the soil so that the soil feeds the plant and it takes a while to build good soil. With chemical fertilizers, you can just buy today and apply the following day and changes will show in a few days. Some of the benefits in Permaculture are not visible, at least not in the immediate future. (Interview #Z4)

5.7.1.7 Seasonality and agricultural activities

Seasonality has a bearing on the kind of agricultural activities and crops that people may grow. Rainfall, and therefore water availability are key determinants of agricultural practices in many places. The main reason why people do not grow much in winter in most of southern Africa is that it is generally dry and they would need to water the gardens, which brings new challenges of labour and equipment as one interviewee noted:

Facilitator: We try to produce throughout the year but the winters are very dry. (Interview #SA3)

However, sustainable agriculture practices such as MFS were built with a view to ensuring production throughout the seasons as well as to mitigate risks of crop failure.

Facilitator NM: And he found that this system that we call the relay intercropping, relay intercropping simply means that in every season of the year, there is something in the land. Whether it is winter or summer, whether it is spring now – there must be something in the land that is growing ... somebody must be harvesting something at that particular time. In summer too, the same. In autumn, in winter, the same ... you harvest almost every season and you can't be short of food. (Interview #L3)

Facilitator: In Lesotho our main determinant of the cropping season is the frost-free period, not the rain as such. (Interview #L5)

However, the seasonality of rainfall still poses one of the greatest challenges to the development of agricultural practices in a manner that is possible in other agro-ecological regions of the world as two Permaculture facilitators note:

Researcher: Other challenges?

Facilitator: The challenge people face in practising Permaculture in a farming situation is associated with Zimbabwe or other countries in southern Africa having seasonal rainfall. It is more complex because it makes zoning difficult. The whole livestock thing is difficult. It is

difficult to do whole land designs because in the dry season, animals roam freely and one cannot protect trees and other vegetation from being browsed or grazed... So in such environments, people end up practising only certain aspects of Permaculture. (Interview #Z4)

Researcher: Coming back to challenges, what gaps or problems do you face in promoting Integrated Land Use Design (ILUD) – Permaculture?

Facilitator AM: The two main problems are not getting enough manure to support the production of crops; and the limited availability of water, especially in the dry season. (Interview #Z1)

Rain fed agriculture is a time sensitive practice as Richards (1999, p. 104) noted, “If a man misses part of the planting (ploughing) season or a woman is incapacitated during the weeding season consequences have ramifications throughout the rest of the farming cycle.”

5.7.1.8 Spatial configurations and considerations

Spatial dimensions of practice manifested themselves in how agricultural practices were reliant on the quality of the soil, the availability of moisture, temperature levels especially in the case of Lesotho where they no longer know when frost will hit, as one interviewee noted in the study:

Researcher: Do you have more frost periods, longer frosts periods or less? You talked of frost periods. Are they becoming longer or shorter?

Facilitator: It's becoming unreliable. You no longer know when frost will hit. So that is the problem. Because that time we used to know that if there will be late frost, maybe it will be in September, early September. Not later than that. But now you can feel that it is still not very warm [early October]. Usually this time it's very hot here. But this time it hits any time it likes. Like last week there was snow. (Interview #L5)

It took more than a decade to develop the MFS as a practice. The nature of the practice has been shaped by the soil conditions of Lesotho, the weather patterns of the country, the traditional practices of the Basotho people (Mosenene, 2000; Grandin, 2001; Machobane & Berold, 2003). In some parts of the country, because of relatively good availability of rainfall, it is possible to plant and harvest four times on the same piece of land in a year as part of relay cropping, something that would be difficult to achieve in drier areas without use of irrigation. The practice was also influenced by the need to develop a system that meets the situation of the poor women whose husbands were away working in the mines of neighbouring South Africa (Robertson, 1994). Distance from and accessibility to markets for agricultural produce also determine what crops may be grown. The prevalence of HIV in many areas and the inadequacy of health facilities has encouraged farmers to plant „crops“ such as *moringa* in Zimbabwe and other highly nutritional or medicinal plants in Lesotho and South Africa such as African potato, *Aloe vera*, garlic and beetroot.

5.7.1.9 The significance of time in learning a practice

The implications of time and space considerations suggest that any learning and developmental intervention should have a long-term perspective. Short-term training, which is one-off, has limited impact in improving understanding and knowledge of sustainable agriculture. It takes time to learn, master and appropriate the necessary skills. Experiments and innovations, which can generate new knowledge also takes a long time. Secondly the building of a new practice of farming such as sustainable agriculture will often take a long time because ecological processes of building the soil, enhancing agro-biological diversity and providing ecological services beyond the farm often takes years. It also takes time to make money from the practice as well as to generate social benefits. This value of time as both enabling and constraining resonates with the concepts of temporality that is embedded in the notion of practice (see Section 1.7.2). If the success of sustainable agriculture interventions is measured too soon, or the accompaniment of farmers learning sustainable agriculture is terminated too early, the results will be distorted; if the learning of the sustainable agriculture promoters is too short and therefore shallow, the growth of the practice will be severely undermined and therefore ineffective.

5.7.2 Social and cultural backgrounds

Critical realism argues against methodological individualism (Price, 2008) which happens when you only take account of what is said by people and discount other factors such as the influence of modern consumerist cultures on continuities of farming habitus. There was a general feeling among research participants that successful farmers and extension workers appear to be those who have been brought up in farming families or environments. This can be linked to exposure, history and family habits. This suggests the relevance of habitus, which appears to be central in practice (see Sections 1.7.3 and 3.5). As indicated in Section 5.4.2, some people are born with farming in their veins which proposes that people with a farming background are more inclined to learn about it – although there are other factors which influence the learning of a practice (see Section 5.7.3). There appears to be a number of reasons to account for this: one of them is having knowledge of and experiencing farming as a cultural practice. The other is that such exposure may stimulate a liking of the practice, especially if those practising it have admirable qualities. A related point is that they may already have their families’ identities which inculcate certain dispositions in them, which result in them becoming farmers too. The conversations below show how the interpretations above were made.

Farmer Mu: *I was born to a farmer. I grew up farming. I tried other jobs but found that they were not good for me so I returned to farming. I have been farming since the 1980s.*

Farmer AB: *I have never known any other kind of work in all my life. I went straight into farming soon after completing my „O“ Levels. I used to visit my uncle who was an employee*

somewhere and I did not like the way he was treated by the employer and his children. Not much respect for him. (Interview #Z2)

The potential use of understanding one's background and contemporary circumstances can provide important clues about which people to invest in as far as agricultural skills and knowledge development is concerned as one farmer interviewed in the study hinted:

Researcher: *And in your family, is there anyone who is taking after you?*

Farmer: *In my family certainly no but it is the guys who are working with me – you know some youngster. Well if you grow up on a farm, you can learn it but these guys who are just looking for a diploma it must be costing the government a lot of money. It is insane, absolutely insane.*

Researcher: *What do you think would be a successful strategy for identifying people to train to become farmers?*

Farmer: *Upbringing is an important factor, people who know what it is to farm. Coming from a farming background is important. (Interview SA5)*

The above conversation also indicates that not all people born to farmers will take farming as a career. But nurturing people in sustainable agriculture environments can result in a culture of organic farming which becomes deep-rooted and therefore becomes part of the nature of a culture as one farmer/facilitator noted:

Facilitator/farmer: *So I am looking at organic development at this point as being the development of the agrarian consciousness so that children that are born into this world now, like my own two children, can grow up in that environment of knowing and of understanding agriculture from an ecological point of view, not having to break down preconceived ideas ... that we are not separate from nature, that we are not here to reign supreme over ecological balance, that we have tried to do that and we have failed miserably. (Interview #SA2)*

And the same point was made about MFS:

Facilitator: *Now, with the kids, we want them to grow with the system. The MFS should be part of their lives. They must not find it when they grow up when they go back home, they tell their mothers, they tell their grandmothers, I will do this, and that and that, on the ground. (Interview #L6)*

The above responses suggest that some people become farmers because it is a family trade – they are born into it and grow into the cultural practices of farming. There is a hint here that these two farmers were defending their identity as farmers' offspring and therefore as farmers, lending credence to the notion of "like father like son" at the same time. Illeris (2003) suggested that it is easier for an individual to learn, when the learning does not involve a change in individual identity. Nearly all the farmers interviewed had a grandparent or parent who was a farmer. Knowing someone in the family who was a farmer tended not only to inspire respondents to go into farming but also to know something about farming, to

have a feel for it. This idea resonates strongly with Cussins' notion of *cognitive trails*¹⁵, which are created and recreated in the flow of one's experience and serve to guide people as they move through space and time – making the terrains knowable and liveable (Daniels, 2008). This also links to the tacit and experiential nature of practice (see Sections 1.7.2 and 2.5.5).

5.7.3 Work affordances and gender relations

While historical factors as discussed under Section 5.6.2 above have a strong bearing on current practice, as critical realism enables one to explain current practice, there are also contemporary factors such as work affordances, gender relations and power which have a bearing on the learning and practice of sustainable agriculture.

Women in east and southern Africa do most of the agricultural work (IIRR, 1998). They tend to focus on the production of food crops while men tend to focus on cash crops with the result that they possess knowledge of different kinds of crops (Mukute et al., 2002, p. 48). In Lesotho, women had to go into crop farming because men went to work in mines and to look after livestock (Grandin, 2001, p. 10). Ironically therefore, only a small percentage of agricultural trainers in government and in NGOs are women. This can be traced to the policy on agricultural training which favoured men at the expense of women. There has therefore been an entrenchment of seeing agricultural training as a preserve for men. On the farms, women tended to do the more detailed and tedious work while men did work which required more energy and this has been attributed to their different physical abilities. One interviewee made the point that „less heavy“ does not mean „less difficult or less demanding“. He observed that the horticulture industry in South Africa is dominated by women because men see most of the work there as feminine. In Zimbabwe the African Farmers' Organic Research and Training organisation which worked with the concept of farmer field schools in supporting the growing of organic cotton realised that of the 64 trained farmer field workers, only nine were women (Wilson, 2002). A study undertaken to establish why so few women attended the training established that:

The husbands were jealous, the women's lack of education, and that women are tied to the home by their responsibility for cooking, and for taking care of children and animals. The root causes of these problems can be derived back to the men's strong position in the culture and the fact that man, according to prevalent culture, has the right to decide over [for] his wife. (Wilson, 2002, p. 19)

¹⁵ Cognitive trails 'mark' the landscape in which people have acted and as they act as a means of support for future action (Daniels, 2008, p. 129). They serve as a signposting for coordinating sensation and movement, 'an experiential line of force' according to Cussins (1992, in Daniels, 2008).

The findings of the study cited above show how power and its distribution between men and women enable and constrain choices, especially those choices made by women in rural settings.

Farmer FC: *I found my husband farming and just joined him.*

Farmer RM: *Same applies. I found the going tough in the beginning but I am used to it now. (Interview #Z2)*

The responses of female spouses, who are also farmers, suggest that one does not have to be born into a farming family in order to become a farmer. Instead, the responses indicate that affordances can cause people to develop new practices through their own agency and that of others. In South Africa one of the farmers interviewed lived in a rural area on the outskirts of Durban and did not have a history and background in farming. However, he was part of a group of young people who were given land for farming and trained in Permaculture and Organic farming.

Researcher: *Why did you decide to go into farming?*

Farmer: *I think it is good. We are doing farming because there is no work now in the world. I think is better we try to do our self to create a job. (Interview #SA9)*

5.7.4 Economic and cultural capital

Financial resources and levels of education seem to be another key factor shaping farmer learning processes in the study sites under review. This comes through in a number of interviews:

Facilitator: *The big picture is missing because there is no general farmer education; looking at the big picture such as dangers of dependence so that farmers understand where they stand ... It is that level of awareness, which is helpful especially for implementing longer term things. It is about understanding the why ... This is part of the general education and awareness that I was talking about earlier. The issue though is how do you pay for that kind of education, awareness, which is where the sustainability lies? (Interview #Z4)*

In Lesotho, poor funding of the NGOs undermines their extension activities, which in turn de-motivates MFS farmers:

Facilitator: *But like I said, they are now on their own because we no longer have funds for extension to support the activities. (Interview #L5)*

Most small-scale farmers do not have the necessary resources to put themselves on long-term courses. They often have to depend on courses that are sponsored and available and most of these are short-term. Some farmers have accumulated cultural capital in terms of farming knowledge but not in terms of general education and this is seen as a challenge in the learning of sustainable agriculture practices. They have gathered this from other farmers and from

practising but many have not been formally educated as farmers. In trying to facilitate their knowledge, it is easier to build on existing knowledge about farming. This is the case in Zimbabwe and Lesotho where people were not disconnected from their land. However, low literacy levels of farmers in all case studies were identified as a problem particularly when associated with sharing difficult concepts, especially in a second language, English:

Facilitator: Some of the farmers have not gone far with education. But they can follow you if you demonstrate. Instead of describing how you did a hole, you do it and they do it. It is hands on. (Interview #Z3)

Facilitator CM: The other challenge is that the language in the handouts is too advanced for the readers. It may also need simplifying in English. The language is for intellectuals. Participants have to rely more on listening to the facilitator. (Interview #Z5)

Facilitator: I would like to produce some of the materials in the local language because most of the ultimate users would find them more useful. I would also like to include more visuals in the materials than is the case now because visuals help people understand ideas better and faster. (Interview #Z1)

Facilitator: The materials we used for training was basically tailored for trainers not for farmers. This is a problem not only in sustainable agriculture. It is a general problem. (Interview #Z4)

Facilitator/farmer: While I was still pioneering my property, I was still hesitant to get into training and training programmes and things like that because I felt that unless I was actually walking my talk, and was actually doing successfully what I was trying to teach, there was a certain amount of credibility lacking... There are few actual examples of people walking their talk, actually doing that which you are trying to teach. That really helps me try and overcome certain barriers that I could be facing. My predominant language is English; my Zulu is not very good. But showing people around on my farm, they can see that I am a plant person, I am working with seed, I am working with plants, I am working with the earth and that transcends culture, race and language barriers. (Interview #SA2)

An example of a resource material that is used for the training of farmers in organic agriculture which shows how mediating tools are inappropriate for the socio-historical contexts in which they are used can be illustrated in two extracts from training materials below (see Box 5.3). Inadequate attention is given to the development of mediating tools in Case Study 1 and Case Study 2 where English is generally used as the medium of instruction. Training materials are often better suited for trainers but the same materials are used by farmers as there is very little specifically developed for them. The history of this problem can be traced back to the technology transfer approach in which the researchers who did the researching and designing learnt and communicated in English, which in turn can be traced back to colonialism and the marginalisation of local languages in education and training systems. However, in the MFS, the mediating language for farmer learning is their local language, Sesotho. This is largely because the innovator of the practice was a local person

who communicated the practice in Sesotho and most of the current literature on the practice is still in Sesotho only.

Box 5.3 Extract from farmer training materials

Example 1 on organic agriculture

Introduction to Organics

What is Organic?

“Crop or crop production produced without, or not involving the use of fertilisers and pesticides not wholly of plant or animal origin...”

As with art, there are many ways in which one can go about creating an organic system. One [you] should look at your area as a canvas on which you can express yourself and exercise your creativity and your own unique style. There are laws surrounding and type of manifestation – in art you have your complementary colours, you have perception. What is it that you are going to create, how does it work with its surrounding elements, is there a purpose or is it just fancy? Like are there is a wonderful freedom allowed with organics and to be able to fully express yourself, you need to understand your medium. Once you understand the fundamentals, you let your creativity flow. Look at your garden as your painting and allow nature to be your teacher...

Seed saving

Like all living organisms, plants have a DNA structure that is in constant evolution. Due to this natural survival technique, seed saving or the harvesting of seeds from your own plants can serve to improve the strength and resilience of your system ... As the seasons go by, specific plants become acclimatised to your specific conditions and each successive generation will be better suited than the last. To successfully accomplish this you would allow only the best and healthiest of the crop to go to seed and then be sure to wait for it to be mature before harvesting...

Source: Muller, 2008, pp. 1 & 15)

Example 2 on natural pest control in Organic Farming and Permaculture

Biological control

Biological control refers to the process of pest management achieved through the use of living organisms, namely predators, parasitoids or pathogens. To be effective, cropping systems need to be designed and managed in such a way to enhance the function of natural into that immigrate naturally into and multiply within the crop. This approach to biological control is called conservation and it has a particular relevance for smallholder farmers in the tropics. In some cases where a particular natural enemy species or group of natural enemies is missing from a crop or a specific region, these can be introduced from other areas (introduction, inoculation or augmentation). In other cases, particular enemies can be reared in large numbers in special facilities and released into the crop at intervals (inundation).

Four steps for improving biological control of pests

This field guide is intended to help extension staff and field staff provide support to farmers so that biological control can be improved. In general terms, four important steps are generally required.

Step 1: Find out which natural enemies are present (see part 2 of the guide)

In most cropping systems, natural enemies will either be present already or be close by and therefore do not need to be introduced. It is important that pests and natural enemies on a crop be recognised (Picture 8). This field guide aims to help trainers recognise the most important groups of natural enemies and in turn share this information with farmers...

Source: Verkerk, 2001, p. 18

The limited economic capital of NGOs often prevents them from developing the cultural capital of trainees in the manner in which they would like, forcing them to invest too little time in individual learners – problems include two-week training workshops and limited post-workshop support, inadequate resource materials production and distribution. Permaculture facilitators and farmers alike do not have the necessary financial means to support short-term training, let alone long-term training. This affects the mediation tools available for farmer learning.

5.7.5 Quality of training offered

Another key factor that shapes the quality of farmer learning of sustainable agriculture practices is the level and quality of training offered. This is supported by the following statements:

Facilitator: *The challenge is that there are a lot of novices promoting sustainable agriculture, who must get their act together to offer more comprehensive education and training. (Interview #Z4)*

Researcher: *What kind of courses did you attend?*

Entrepreneur/farmer: *I did a proper Permaculture course a proper Bill Mollison accredited Permaculture course¹⁶.*

Researcher: *How long was the course?*

Entrepreneur/farmer: *It was also only a seven or eight day course, maybe two weeks, I can't even remember. It was actually a very incomplete course ... The course was run by the people that were at that point also in the beginning of the teaching sort of career. (Interview #SA1)*

In South Africa even the introduction of a nine-month course does not appear to have generated the necessary amount of skills and confidence among graduates interviewed:

Researcher: *How long were the courses and how many did you attend?*

Facilitator: *I first attended the two weeks course and then after that I attended facilitator course, organic facilitator course which ran for about nine months if I am not mistaken.*

Researcher: *Nine months.*

Facilitator: *It was NQF Level 5 qualification¹⁷, I did that so, that was only organic farming courses that I have done.*

Researcher: *What is your feeling about the training?*

Facilitator: *I still want to know more things about organic farming. (Interview #SA4)*

¹⁶ This means that the course was officially recognised in Permaculture circles and was conducted by people recognised as competent to run it.

¹⁷ In South Africa, the National Qualifications Framework has eight categories of qualifications (which are being adjusted), with the highest level – post-graduate qualification being Level 8. NQF level 5 is a certificate course equivalent to a first year post-schooling level qualification.

A related problem is that funds invested in learning organic farming are too little and do not give learners enough time to grasp the concepts and practices. This thin spreading of resources is intended to allow budgets to cover as many people as possible but the downside is that they do not gain adequate skills and knowledge: there is a tension between quality and quantity.

Researcher: *What is your comment on the duration of the one-week workshops that you run? You spend two weeks learning and then you spend half that time teaching others the same Permaculture.*

Facilitator/farmer: *At teachers, whose core business is not Permaculture, we try to condense the content. We do these by covering a lot of theory first and then moving to practicals later. (Interview #Z3)*

Researcher: *What are the common errors, discrepancies that you have noticed?*

Facilitator: *Especially when it comes to the use of kraal manure and wood ash – the ratio, the proportion is not the same as practised. And ash, some of them just talk of ash, not wood ash, when they teach the people ... They teach MFS, they train people but I found that they were not doing the right thing*

Researcher: *And why do you think that is the case? Why are people experiencing that?*

Facilitator: *They are experiencing that because they do not know very well the MFS. Or maybe they read about it in the papers. (Interview #L6)*

Researcher: *And MFS, where did you learn about it?*

Facilitator: *I am coming to that. In that 1996, there was an introduction of the MFS by Dr J.J. Machobane.*

Researcher: *How long was the training?*

Facilitator: *It usually took just two to three days, theory then practice. More emphasis was on the practice than theory because everything has to be done on the ground. So that is how we got interested. Then I was appointed as one of the animators¹⁸ to look after MFS. At that time we had a training officer. We were not supposed to train as such. Our role was to assess the needs of the communities and then arrange the relevant training. (Interview #L4)*

At the same time, there have been successful attempts at producing competent sustainable agriculture facilitators but this had both time and budgetary constraints as illustrated by the following response:

Researcher: *Any other point on constraints?*

Facilitator: *A trainer had to work with only six trainees at a time. Trainees were paid a minimum wage during the course. They learnt mostly through practicals, with an average of two afternoons per week spent on theory ... Thinking about it more I really see this as a big issue - the need to develop longer term training and I think distance education is the way, combined with workshops now and again. (Interview #Z4)*

Throughout the above discussion, a quantitative issue of time translates into a qualitative problem of performance. So in a sense then, the fact that there are many under-trained

¹⁸ An animator is a kind of facilitator or development worker.

facilitators and farmers does not mean that the training being offered in itself is poor but that the level at which it is being offered, which is determined by time and resource allocation, is what is problematic and ought to be addressed. These conversations illustrate a theory-practice dialectic which is significant in the mediation of questions concerning sustainable agriculture and quality.

The learning and practice of sustainable agriculture by farmers is also shaped by sustainable agriculture facilitators in terms of their capacity. This capacity can be seen in terms of how much they know about the practice and how well they can facilitate its learning. It is also determined by the extent to which they can aid in its implementation. Where facilitators are competent and have the necessary resources to work with farmers, learning processes are made easier and become more effective but where either is problematic, learning and practice are undermined. In all three case studies, there is evidence to suggest that many sustainable agriculture facilitators do not have adequate technical skills largely because their training is too short and therefore often shallow.

5.7.6 Agriculture and education policies

Some agricultural policies in the three countries under study tend to encourage the practice and learning of sustainable agriculture, others do not. Some educational policies in the three countries favours sustainable agriculture, others do not. The general trend has been that historically, sustainable agriculture was marginalised and often associated with backwardness because it did not use some of the modern technologies such as chemical fertilizers and pesticides (Muller, 2008). The interviews below show how agricultural and educational policies – rules in CHAT language – have generally constrained sustainable agriculture.

Researcher: *What kind of difficulties are people facing in promoting and practising the MFS?*
Facilitator: *You know it's because, you know people are poor. There is poverty. But you find that, I think it's to do with the policy or lack of policy [both laugh] and the practices of government because you find that those public systems have a subsidy. There will be subsidy for the tractor. There will be subsidy or people who will be given fertilizers. But those are not applicable under MFS. So those farmers who are willing to work on this, it means that they are not going to get anything because there is no assistance of that kind which is going to that type of agriculture. It's only going into conventional farming methods.*

Researcher: *But why is government not supportive of this?*

Facilitator: *You know the government, I would say, at policy level, they recognise MFS, they recognise Permaculture. Conservation farming is the cream, the priority but the people who are supposed to implement these things are not convinced that this is the way to go because their training is on conventional agriculture. So implementing those policies is a challenge because I can say even if they would like to do it, they are not ready...*

Researcher: *I don't know if there is something else you want to add to our discussion.*

Facilitator: *No but like I said, the battle faced by the MFS it's similar to the adoption of conservation farming here because although the ministry it's say conservation farming is a priority, that is not being translated into a budget. If you ask them, show me the budget for conservation agriculture, you won't get it but if you say show me the budget where you*

subsidised tractors, you will get it. So it's the same thing for MFS. It is there in the policies, and priorities but it's not translated into concrete actions that we can see in the budget. (Interview #L5)

Researcher: *Now, as someone with a very strong and deep background in Agriculture, what kind of difficulties did you find in accepting the MFS – before you went to Bulgaria and afterwards?*

Facilitator: *Before I went to Bulgaria, there was a general impression given to us by the powers that be, yes the government – that the MFS was primitive. It was very primitive. „This man was sending us back to where we came from“ [both laugh]. So my impression although it was not well-founded, but it was just what we heard from government, the officials, and the extension officers then. They were so much against it that we were not, even the teachers, were not allowed to talk about it at school. It was almost like a crime. (Interview #L6)*

In South Africa similar concerns and sentiments were raised in connection with agricultural education as discussed below:

Facilitator/farmer: *One of the largest stumbling blocks I have come across in working with trying to train people in small-scale agricultural development is the negative effect of the education system of apartheid years where if you were clever you went to a normal school, and if you weren't so clever but were good with hands you went to a technical school and if you weren't good with your mind or hands, you went to agriculture. There is a stigma attached to agriculture that prevents our society [from appreciating the importance of agriculture] to the core, where especially people who in the last two three decades, a lot of people got uplifted from agriculture areas into urban and have finally got a job through much hardships and much perseverance in the commercial sector. To hear that his son wants to do agriculture is like a knife in the heart. (Interview SA #2)*

The effect of the government policy was the stigmatisation of agriculture in general and the double stigmatisation of ecological agriculture in particular is pointed out below:

Facilitator/farmer: *Evolution was perceived along entirely different lines of western or industrialised culture, technological advance and education of course. And agriculture was in many cases in my experience seen as a step backwards and not a step forward, especially with this concept of ecological agriculture, not utilising the technological advances of the pesticide industry, not embracing the technological advances of genetic spicing and genetic manipulation, fertilizers, superphosphates, things like this. (Interview #SA2)*

The issues are similar in Case Study 1 though not as pronounced:

Researcher: *What policies have a bearing on the promotion and practice of Permaculture?*

Facilitator: *The dominant policy is still pushing for high input agriculture. It seems in the education the policy of education with production and linking the schools grounds to the curriculum was encouraging while that of promoting neat schools worked against Permaculture. There are ambivalent messages from government on this. (Interview #Z4)*

Some academics, who often have some input in policy making processes in the region, are doubtful of the effectiveness of sustainable agriculture practices such as MFS as the following interview reveals:

Researcher: *Now among your intellectual and academic friends, have you not encountered some who challenge you for working with the MFS?*

Facilitator: *Indeed, when I was principal at the college, Lesotho Agricultural College, I started talking about the MFS to my students, just talking like that, even taking them for practicals on my own, in my own time, without interfering with the school curriculum, because we had one system called Student Enterprise Project. So I used to take those who were in the project, the Student Enterprise Project and show them the MFS techniques. Now one day we had a meeting with our colleagues at the National University of Lesotho – because we were affiliated, the agricultural college is affiliated to the university. And we had a general meeting about how agriculture is being taught. Now some of my students were in that meeting. And they asked, „why is it that we do not practice the MFS?“ There is a colleague of mine who is a professor. He jumped. He was chairman of the meeting. He jumped and said, „Look, we have not come here to play. We have come to discuss serious matters about agriculture“ [both laugh]. „After all, do you have evidence to show that this thing you are talking about works?“ (Interview L6)*

The unsupportive attitude was also identified among officials in the Ministry of Agriculture and Food Security in Lesotho and noted by Grandin (2001, p. 13):

There is a general and prevailing scepticism to MFS within MoA [Ministry of Agriculture]. This stands out as the single biggest hindrance to mainstreaming the technology [MFS practice]. This scepticism effects [sic] opinion and support not only within Lesotho but abroad too. Partnership and a culture of understanding between MFS practitioners and agents of the MoA is essential if Lesotho is to address the pressing need of food security and resource management.

The study grappled with this „single biggest hindrance“ as will be discussed in Chapters 6 and 7. Meanwhile, this study noted that environment-related policies seem to be changing for the better according to one of the farmers interviewed.

Farmer Mu: *We planted bananas as a way of protecting the river bank, when in fact the government regulations were that we should not plant anything within a certain distance from the river bank. In 1992, the Natural Resources Board officers fined us for breaking the law. However, in 2004, the same authority awarded us a national prize for effective conservation practices for looking after the same river bank using the same methods for which it had fined us. (Interview #Z2)*

Some progress has been made also in recognising the potential of sustainable agriculture in the formal educational system as illustrated by the formation of SCOPE in Zimbabwe. And through the system, farmers in the communities that are served by the school have also had access to some training and education in sustainable agricultural practices. But there are still some notable tensions.

Researcher: *What constraints are being faced in promoting Permaculture?*

Facilitator: *One major constraint is the education system, especially the teaching of agriculture – because it comes from a different premise, which is high external input. It is a different mindset, encouraging mono-cropping. It is like managing land as if it were a factory, not as a living thing. (Interview #Z4)*

Some land tenure policies encourage sustainable agriculture practices because they are more secure, while others may discourage it because they are insecure and farmers do not want to invest in soil and water conservation when they know that the land can be taken away at any moment. These examples in Lesotho and South Africa illustrate the challenge:

Facilitator: *You would hire land today and tomorrow someone would like the land back. So it would be difficult. Once he sees that you are getting something out of the land, he will say aah, I am going to use my land now. So you will be forced to move to another land, so that disturbs the craft (Interview #L4).*

Facilitator/farmer BM¹⁹: *And I was explaining to Mutizwa how important it is for organic farming developing a land over 10 years, how land ownership is important.*

Facilitator EZ: *Also I found, if you don't own the land, you have got no interest in looking after it. (Interview SA#8)*

Seed policies are another important determinant of sustainable agriculture practice. For example, in Lesotho MFS farmers prefer open pollinated varieties but the government does not supply much of this.

Facilitator: *So they [government extension workers] would still continue supporting the conventional agriculture. Like now we have tried to promote OPVs, open pollinated varieties but the government people are still promoting hybrid seed. Even the seed input fairs that are running now; they would reject some of the OPV varieties and saying ,aah this one we don't know, this one we don't know. We do not support things we don't know".(Interview #L4)*

The problem of seed policies appears to have been worsened by the increasing availability of Genetically Modified Organisms, which are likely to increase farmer dependence on agro-companies and undermine the former's resilience:

Facilitator/farmer: *I think my biggest concern, which I would like to mention is the tragic loss of plant variety that we have experienced this century. ... I think that the atrocities of the genetic modification of seeds and plants needs to be severely addressed seeing that South Africa is the largest producer of GMO crops [in southern Africa].(Interview #SA2)*

As environmental and human health benefits of sustainable agriculture became better known, the tendency has been a gradual acceptance and promotion of sustainable agriculture at policy but generally not at practice level. In spite of these changes, conventional agriculture learning

¹⁹ BM attended the interview which I conducted with EZ and occasionally made input as he did in this case.

and practices are predominant and do get significantly more resources. Most agricultural colleges concentrate on conventional agriculture and extension officers do not know enough about different forms of sustainable agriculture to be able to train farmers in these (S. Worth, 2007; see Section 5.6.4). The following two sections below show there is a policy-practice disconnection in Case Study 3.

5.7.7 Societal values and attitudes

Honours such as this one, tell us something about how societies reflect upon themselves in history and finally come to see light. The example of Machobane shows that it is not the absence of talent that bedevils nations, but the extend [sic] of their willingness and will to recognise available talent and to institutionalise its achievements. (Robertson, 1994, p. 121)

The above eulogy, made when Machobane was awarded an honorary doctorate by the University of Lesotho, shows how dominant development discourse and powerful authorities can marginalise what holds promise and deny what Visvanathan called cognitive justice (see Section 2.2.4). In the above section (see Section 5.7.6) agricultural and environmental policies were discussed in relation to how they mediated (as rules) the relationship between farmers and the object of their farming activities, using CHAT lenses. The same kind of analysis within critical realism has been used to explain how structural mechanisms such as policies with embedded power relations constrain or enable sustainable agricultural practices. In this section the thrust is on how values embedded in individuals and societies also explain deeper processes that influence farmer learning of sustainable agriculture. The agriculture profession is not seen as „mental sport“ in South Africa, especially by communities that want to move away from being rural and agrarian to becoming modern and industrialised societies. The situation is even worse for sustainable agriculture which is seen as taking people backwards supposedly because it does not take full advantage of scientific and technological development. And that is why sustainable agriculture appears to have suffered double stigmatisation in two of the three case studies investigated (see Section 5.7.1.2). One interviewee indicated that the circumcision school values which were embedded in MFS made it difficult for outsiders to learn about it as indicated below:

Facilitator: *MFS has been kept as a „holy secret thing“ to prevent outsiders from knowing how it works, a sacred thing reserved for the few. The founders and his immediate followers were not keen to have scientific investigations into how and why the system was performing. For example, I was discouraged from taking soil samples from fields in which the MFS was happening. (Interview #L7)*

5.7.8 HIV and AIDS

HIV and AIDS offer some explanation as to why some farmers are learning and practising different forms of sustainable agriculture. In third generation CHAT (see Section 3.4.3), there

are some activity systems that produce subjects and new ways of dividing labour. In all three case studies under review, HIV and AIDS were producing new kinds of farmers: weak from recurrent illness and in need of more nutritious food than would ordinarily be the case. Orphaned children have also had to become heads of families responsible for such practices as farming. This has changed division of labour as children and the elderly have also had to assume duties normally done by the strong. Poverty and HIV and AIDS have a dual effect. Poverty encourages farmers to adopt sustainable agricultural practices because they are more affordable (see Section 5.4.1). At the same time poor people readily obtain and use free agricultural inputs such as hybrid seed and chemical fertilizers. In this way, poverty creates a dependency syndrome among some rural communities, undermining sustainable agriculture. Similarly, HIV and AIDS is pushing people to look for food that is nutritious, safe and fresh, which sustainable agricultural practices promote, while at the same time killing farmers and draining them of their energies during illness, factors that undermine agriculture, especially labour-intensive sustainable agriculture. In critical realism the state of the body, which is weak from inability to fight diseases and therefore to do work becomes an explanatory principle against a background of why land being farmed may be contracting when the number of people needing to be fed is increasing.

The HIV and AIDS pandemic is killing many people in the agricultural sector, thereby depleting the skills base, which undermines the practices according to the New Partnership for Africa's Development (NEPAD, 2003). In addition, it is causing many people to become too weak to work, especially when they are sick (Rau, 2006). In many communities, child-headed families have emerged. Some of these children have to become farmers but often they do not have the experience of farming nor the energy to do it (Ncube, 1999). The pandemic therefore has implications on the nature of technologies that may be necessary for as long as the pandemic prevails (Richards, 1999). In some cases, the orphans are too young to grow food for themselves and have to be assisted by the community, thereby increasing the local dependence ratio. This is why, for example, St Margaret Primary School established a nutrition garden dedicated to orphaned children both to supply food and generate income.

From the above subsection which looked at the socio-cultural implications of learning, we can see that context has a bearing on how people learn, what they learn and how they learn. Underpinning the discussions above is a clear message that farmers' engagement in farming is intentional, indeed, purposeful and that often they have to improvise given both the material and socio-economic circumstances in which they live and work.

5.8 SYNTHESIS: SUSTAINABLE AGRICULTURE PRACTICES AND LEARNING

In keeping with the interpretive nature of the focus of this chapter, I conclude by discussing the logic behind the emergence of sustainable agriculture practices; why farmers incorporate

sustainability in their workplace; and summarise the main structural and contextual factors that enable, constrain and are interwoven in its learning and practice. Table 5.2 below summarises the factors that shape farmer incorporation of sustainability in their farming practices.

Table 5.2: Synthesis of the main factors that shape farmer learning of sustainable agriculture

Sub-topic	Main conclusions and value to the study
History of sustainable agriculture practices	The different but related histories of sustainable agriculture practice revealed two main points: that MFS, Permaculture and Organic farming were developed in response to environmental risks; and that the contemporary tensions between agro-chemical industries and sustainable agriculture practitioners have historical origins. Therefore a risk epistemology and a dialectical approach to addressing some of the challenges embedded and embodied in sustainable agriculture, appears appropriate.
History of individual case studies	The specifics of a case study provide the context in which a practice may be learnt and implemented and the kind of enablements and constraints that are likely to arise. These may be associated with agro-ecological conditions; educational and agricultural policies; or societal values and attitudes; or affordances and power relations. Learning and development interventions need to connect with such specifics for relevance and effectiveness.
Farmer motivation to learn	Farmer learning is influenced by both intrinsic and extrinsic factors. Extrinsic factors include the need: to produce adequate safe and nutritious food and surplus to generate income; to improve their resource base for their own good and for the benefit of future generations; to generate ecological services. At the same time some farmers have ended up taking up the „trade“ because they have a passion for it; a concern for the future of the people and the Earth; and a disposition to farm.
Facilitators“ motivation to learn to „teach“ sustainable agriculture	The study suggests that sustainable agriculture facilitators are driven by the desire to develop agrarian consciousness ²⁰ which is underpinned by a care for the health of the people and the land upon which people“s health is dependent. Facilitators also expressed an interest in building community resilience.
How farmers learn	Farmers use different ways to learn. They learn through both vertical and horizontal movement of knowledge, from and with experts and promoters as well as among themselves. Much of their learning has a practical orientation and includes learning by doing, observation, trial and innovation. However, they do not appear to have systematic and joint mechanisms for continuous and strategic learning around their emerging needs and interests.
Factors that shape farmer learning and practice of sustainable agriculture	Time is a central explanatory factor in farmer learning of sustainable agriculture. It is necessary for mastering a practice; building soil ecology; enhancing agro-biodiversity and improving ecological services. Time is necessary to build the resource base so that farming becomes viable. Place determines what can be feasibly raised, when and where depending on seasonality, rainfall patterns, snow and frost periods, soil quality and topography. This has time implications in terms of rate of progress towards sustainable agriculture. Social and cultural backgrounds shape people“s dispositions to go into farming with those that have a history of farming in their families and neighbourhoods likely to develop an interest in it. Circumcision schools, <i>mafisa</i> , <i>matsema</i> and <i>lesielo</i> are some of the traditional practices being built on to incorporate sustainability into agriculture. At the

²⁰ “There is another way to live and think: it’s called agrarianism. It is not so much a philosophy as a practice, an attitude, a loyalty, and a passion – all based in a close connection with the land. It results in a sound local economy in which producers and consumers are neighbours and in which nature herself becomes the standard for work and production.” (Berry, 2002, p. 7)

	<p>same time, opportunities and work affordances can also encourage people to go into farming irrespective of their backgrounds. Gender relations also influence choices.</p> <p>Generally, the low economic capital of organisations promoting sustainable agriculture has undermined the quality of training as facilitators mostly receive short-term training. This in turn reduces the efficacy of training they offer to farmers, which results in a stunted growth and performance of the practices. Farmers' levels of formal education – a form of cultural capital, are generally low and training language and materials employed by facilitators are generally not suitable mediating tools.</p> <p>Mainstream agricultural and educational policies in the three countries where the study sites are found, are still inadequate and ineffective to support the growth and development of sustainable agriculture and generally favour high external input agriculture.</p> <p>Meanwhile, HIV and AIDS has been shown to have ambivalent effects on the learning and practice of sustainable agriculture. On one hand, it has created the demand for safe and nutritious food, while on the other it has killed able-bodied people who are better placed to deal with its labour intensive nature.</p>
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From the above table (Table 5.2) it is evident that it is not only cultural-historical factors that influence learning in agriculture but also the material and physical factors such as soils, ecology and weather patterns. In this case then, an exploration of farmer learning processes in this study appears to suggest not only a cultural historical activity system but one that may be called a socio-ecological and cultural historical activity system. Another important insight from the exploration of learning processes in the study is that it is not only the empirical and the actual that shape learning but also the real, even if those concerned may not understand that to be the case.

5.9 SUSTAINABLE AGRICULTURAL PRACTICES AND HOW THEY ARE BEING SHAPED

In the above Section 5.8, a synthesis of the exploration of farmer learning processes was provided. In this section, the thrust is on examining how sustainable agriculture practices and associated learning processes are being shaped. The analysis draws on Bourdieu's (1990) and Green's (2009) conceptualisations of practice (see Section 1.7.2 and 3.5) and shows that it is difficult to separate learning a practice, from the practice and nature of the practice itself.

5.9.1 Sustainable agriculture practices and learning are developed in response to risks

The research revealed that each of the three sustainable agricultural practices was developed in response to response to biodiversity loss, soil degradation, high risk agriculture, HIV and AIDS. Organic farming was developed in response to pollution cause by fertilizers, herbicides and pesticides in conventional agriculture, to its undermining rather than building of the soil, as well as to food safety concerns. The MFS was developed in order to address land degradation that was being caused by conventional agriculture methods of farming that were imported from elsewhere without taking adequate consideration of the local soils, slope

and rainfall patterns. Permaculture was developed in response to the negative effects of conventional agriculture on the environment. All the sustainable agriculture practices have a keen interest to conserve water, which is becoming increasingly scarce in the region because of more frequent droughts caused by climate change. Now there is a growing need to cut carbon emissions which come from making fertilizers and using machines to till the land. In addition, the need for more life in the soil so as to sink more carbon is making an even stronger case for sustainable agricultural practices. The learning processes associated with these practices are therefore steeped in risk epistemologies which are surrounded by uncertainties, and this requires reflexive learning (see Section 1.6.1).

5.9.2 Sustainable agriculture practices and learning are shaped by context

The development and shaping of practice is context dependent, with a lot of what farmers learn being based on local seasons, local soil conditions, local history and language. In the case of MFS, the learning approach is also informed by traditional practices such as circumcision schools, *mafisa* and *matsema* (see Section 5.2.3). Learning is also context specific because it uses fellow farmers to teach other farmers. The tradition-informed learning is also underpinned by innovation and adaptation, collective action, self-reliance and building individual, collective and ecological resilience. While traditional practices often form a good foundation for transformation, the secretive nature of circumcision schools appears to have generated a situation where a few, privileged MFS trainers know the „scared truth“ and the majority of the farmers and facilitators know „the profane“. There is also a perception that the protection of the „holy secret“ has resulted in limited scientific input into MFS (see Section 5.7.7).

5.9.3 Time and space as important shapers of practice and learning

The study also revealed that time and space is critical in the development of practice (see Section 5.7). The learning of sustainable agriculture also takes time because of the need to improve the soil, to build agro-biodiversity and well as to produce ecological services. Seasonality also affects what kind of crops can be planted when and what kind of livestock can be kept and whether this needs to be looked after or left to roam. Soil quality and climatic conditions also shape learning and practice. The building of a new practice needs even more time because a new consciousness has to be developed. This is particularly important in situations where the practice may be stigmatised as is the case with organic farming and other sustainable agriculture practices. As such, it is important to have a longer time frame for building such consciousness, even beyond one generation. New structures that support new practices have to be developed and elaborated so that children may grow in them and internalise them from when they are very young.

5.9.4 Practice is laden with experience

Farmers and promoters of a practice such as MFS or organic farming should experience the practice in order to master it and appropriate what is useful for their own use. Practice cannot simply be read about. The Permaculture facilitators who trained for about two years and gained experience in Permaculture during the training were more confident and inclined to try out new things (see Section 5.7.1.4). Those who did not practise after the workshops lost the knowledge and failed to gain experience. Trial and error is central to learning the practice as demonstrated by Permaculture farmers who farmed on the stream bank, introduced agroforestry and tried different mixes of crops (see Section 5.7.6). Some farmers say they are farmers because they grew up in farming families and experienced farming from childhood.

5.9.5 Interpretations of practice not easy from descriptions of them

Some aspects of the different sustainable agriculture practices are better taught through practice because some concepts are difficult to explain as is the identification of new plants. It is also difficult to teach because there are so many diverse options, such as which plants and seeds to choose, and when and where to plant them in the field. Consequently, in Permaculture the actual designing of the school into zones is done as a practical activity. New plants introduced into the area are not merely described but brought in for participants for feel, smell and even taste as was done by an MFS facilitator during our visit to one of the farmer groups when he introduced celery as a new crop (see Figure 5.11). Instead of describing how to plant a crop, a demonstration is done.



Figure 5.11: An MFS facilitator introduces celery to farmers during the study, giving them an opportunity to smell and taste it.

5.9.6 Practice is informed by interest and involves improvising

Motivation is central to the development of practice, and this cannot be pre-determined. Farmers will adopt practices for reasons; they will adapt practices in order to suit their

circumstances and address challenges that emerge. Most farmers link sustainable agriculture to their traditional farming, learning and appropriating that which is useful to them. ITC and FiBL (2007, p. 17) noted that “traditional skills and knowledge have been neglected in intensive agriculture” and that “such knowledge has also been described as a „reservoir of adaptations“”. In implementing Permaculture in communal areas and schools where solidarity was essential, the pioneer promoters of Permaculture in Zimbabwe improvised by adding the holistic goal at the beginning of the design process so that the people concerned work towards a visible and jointly constructed object. The adoption of practice will be shaped by the socio-economic and environmental conditions under which the people concerned live. They then have to make strategic decisions about different aspects of a practice. For example, Permaculture farmers who live close to a mountain with many trees collect and use humus from these commons in their fields and gardens (see Section 5.4.3, Box 5.2). When the impact of HIV and AIDS became more visible, the school decided to dedicate a garden to orphans as well as to grow more herbs to cure illnesses or symptoms of diseases that were becoming common. There was also a strategic logic in this, which could not have been pre-determined. The implication is that the intentionality in learning and doing sustainable agriculture must be understood and developed if the practice is to continue to grow.

5.10 CONCLUSION

This chapter explored learning processes in sustainable agriculture workplace contexts, with a strong focus on farmers and facilitators to answer questions on why and how farmers are learning. The chapter is therefore located in the exploratory phase of the study. The chapter worked with second generation CHAT to describe and represent the activity systems that were dealt with in each case study. Through the representation, the objects, mediating tools, community, division of labour and tools were depicted from the point of view of a specific group of people in the study: farmers, sustainable agriculture facilitators, government extension workers, and organic marketers (see Figures 5.1 to 5.8). The objects of these different subjects are similar and related and so are some of the rules that guide them. One of the key insights from the chapter is that there is a strong ecological dimension in the activity system discussed, with implications that the activity systems in such settings may better be described as socio-ecological, cultural historical activity systems. The chapter also worked with the theory of practice to illuminate some of the learning-practice linkages and processes in the three case studies investigated. Time and space configurations in practice seemed to have a strong bearing on the learning and practice of sustainable agriculture. The intentionality of people involved in the practices, depicted under CHAT as the object were „captured“ as influencing the improvisory and strategic logic of practice. Using the ontological lenses of critical realism, some explanatory principles were sought to understand how learning is shaped by other forces that are beyond the surface which suggested, for example, that women’s limited social power in families undermines their choices to attend

training. Another important explanatory principle was associated with the powerful effect of past land tenure and even educational policies on current sustainable agriculture learning and practice. The agro-ecological factors such as soil and climatic conditions also explain what may be grown where. In the process of the analysis, it becomes clear that the rules in CHAT and the explanatory principles in critical realism tend to refer to similar things, with the latter moving deeper into the reality – beyond the policies, for example. Using Engeström's (2008) agentive layer model discussed in Section 1.6.8 (Table 1.1), this chapter can be located mainly in the interpretative layer where the concern is about understanding and interpreting the logic of things, which was generated through inductive, abductive and retroductive analysis. The next chapter (Chapter 6) is located in the second layer of the model, which is concerned with surfacing contradictions in and between activity systems. The next chapter uses third generation CHAT which enables the illumination of contradictions between activity systems and therefore the consideration of a broader range of contextual matters than would be possible within second generation CHAT. This chapter therefore provides the necessary background for dialectical matters to be deliberated on in the next chapter.

CHAPTER 6: Surfacing Contradictions in Selected Activity Systems

6.1 INTRODUCTION

The previous chapter explored farmer learning processes in sustainable agricultural practices and also touched on trainer/facilitator learning. In this chapter the focus is on surfacing contradictions in and between the different activity systems in each case study (see Sections 5.2.1 to 5.2.3). The focus is located within the contradictory layer of Engeström's (2008) three layers of agentic talk for human action (see Section 1.6.3, Table 1.1). Contradictions are potentially fruitful for the growing of the practices under discussion and the learning of subjects in those activity systems. The chapter therefore addresses the second research question on limitations and contradictions in farmer learning processes (see Section 1.5). And in this sense, this chapter prepares the ground for the expansive learning described in the next chapter. The contradictions that are discussed are largely based on information that was generated during the first phase of engagement with research participants which used interviews as the main data gathering method. I conclude the chapter by looking at the contradictions across activity systems in different case studies to seek out explanatory principles. This information is augmented by data gathered from documents and from CL workshops, where mirror data was presented for validation and action.

The focus of the chapter is on those contradictions that were identified or raised through the study, in the three case studies because these appeared to be significant to the research participants. The research participants wanted to do something about the contradictions but could only feasibly address some of them. It has therefore not seemed necessary to go beyond those contradictions and discuss additional ones from document analysis. However, I have used document analysis to augment some of the analysis made by research participants to provide explanations for some of the contradictions. Since many of the contradictions are common, the chapter avoids repetition of the explanations by using retroductive analysis (see Section 6.6). For example, climate and climate change, agricultural policies, attitudes towards indigenous knowledge, provide cultural historical explanations in each case study.

This chapter draws on Engeström's earlier conceptualisation of third generation activity system (see Figure 3.3) because it enables better insights into the kind of contradictions arising in each activity system may be facing. In Chapter 7, however, I draw on his other conceptualisation of third generation CHAT because it is more useful for discussing interacting activity systems that have a shared object (see Sections 3.4.3.2, Figure 3.4 and 7.2.2).

6.2 CONTRADICTIONS IN THE SCOPE CASE STUDY

In this case study, contradictions are surfaced from three activity systems: the farmer activity system; SCOPE facilitators' activity system, and the St Margaret Primary School activity system which practises Permaculture (see Figures 5.1 to 5.3). The government extension system, which ordinarily has considerable interaction with the farmer activity system does not feature in this case study because data from and about that activity system was minimal. This subsection examines the nature of contradictions and supports this by drawing on deliberations during the study. At the end of each description, an illustrative example of an activity system is constructed and the contradictions are located (see Figures 6.1 to 6.4).

6.3.1 Contradictions in the SCOPE Farmer Activity Systems

Six contradictions are discussed here in the following Sections 6.3.1.1 to 6.3.1.6.

6.3.1.1 Between balancing the social, economic and ecological values of Permaculture practice

There was evidence that Permaculture is a contested practice that seeks to balance the multi-faceted nature of its object of ecological, economic and social sustainability. One of the most revealing methods that were employed during the study was to ask research participants to score out of 10, how they rated each of the three dimensions of the object (see Case Record Sections 2.3.1; 2.3.2; 2.4.1 & 2.4.2). The differences in scores by individual respondents and the variations in the scores suggested that there was potential for generating improved practice by looking at the tensions within their object – a primary contradiction. The follow-up questions on justifications for the scores suggested that it would be useful to produce a tool which farmers and facilitators could use to assess the sustainability of their practices in a given area at a certain point in time (see Section 9.4.1).

Researcher: *How would you score the economic, environment and social value of Permaculture? Say out of 10?*

Farmer AB: *I would give 100 % on the environment, 85 % on the economic and 95 % of the social.*

Farmer Mu: *I would also give similar scores if not the same.*

Researcher: *Could you explain your scores, especially the high score on the economic.*

Farmer Mu: *You see, there is very little one must spend in order to produce. Besides, with intercropping, you can produce a lot of crops at the same time, each with a different value. The other thing that we do here is to make sure that there is something growing in each part of the garden during most time of the year. You see that the tomato crop has been harvested. We have plans for these beds. What makes this kind of agriculture sustainable is that you produce one crop after another, continuously.*

Farmer AB: *The social is high because you do not talk about survival of the fittest. Everyone, even the poor people can practise Permaculture or sustainable agriculture. Most of the resources are locally available. For manure you can go and collect humus from the mountains. I know of some families whose lives were transformed by zero tillage. They used to wait until late in the season to plant because they did not have draught power, and those who have plough their lands first. So through zero tillage, they could plant at the beginning of the season. More people can benefit. (Interview #Z2)*

While farmers in the above discussion scored economic value the lowest, the farmer/facilitator cited below had a different opinion, which suggests that the way Permaculture is practised in the same area yields more economic than social benefits.

Researcher: *How would you rate Permaculture in terms of its ecological, economic and social value? What scores would you give it against 10, for each of the three dimensions?*

Farmer/facilitator: *I would give it 10 out of 10 under ecological sustainability because it improves soil fertility, conserves water and biological diversity. I would give it 9 out of 10 under economic sustainability because it builds on local resources and encourages self-reliance. The inputs are inexpensive and often do not have to be paid for. People can save and plant their own seed and use organic manure. On the social side, I would give it 8 out of 10. It has brought about a lot of positive interaction between the school and the community and between this school and other schools. A lot of knowledge and planting material has been shared. Poor people can practice Permaculture too. The school has food throughout the year, which pupils, teachers and parents can access at a reasonable price, sometimes free of charge... The surrounding community has good access to herbs... which is important given the problems associated with AIDS and the low availability of drugs. The school has even established a nutrition garden to support orphans. (Interview #3)*

The Permaculture facilitator cited below had a relatively low opinion of the performance of Permaculture in terms of social and economic outcomes and made the important distinction between the economic value in the short- and long-term.

Facilitator: *I would score ecological sustainability very high, especially when we are looking at the long term. I would score 9 or 10. Economic sustainability is also high though not immediate. It is generally lower in the short term. Social sustainability would score very low. This is how in integrated land use design courses, we ended up including holistic goal formation, which comes from holistic management. I would score 4 out of 10. This is actually a tough question because in fact Permaculture would also score high in the longer term as far as social sustainability goes because of its emphasis on localisation. It's just that it doesn't really have the „group approaches“ to engender the strong social bonds such as visioning and so on.*

Researcher: *Would you mind giving a score for economic sustainability. You said it was high but did not give the figure?*

Facilitator: *7 or 8 I would say. (Interview #Z4)*

Three Permaculture facilitators in the school each granted 100 % to ecological sustainability but gave relatively low scores to economic sustainability, which highlighted the contested nature of the practice and the potential for learning from it.

Facilitator LM: *Five out of 10 under economic because transportation of surplus fruits is problematic.*

Facilitator CM: *Five out of 10 because of low productivity, low turnover and producing in small quantities.*

Facilitator MY: *Four out of 10 because it does not compare as much with conventional farming where crops can grow rapidly and generate income. (Interview #Z5)*

The assessment of the economic sustainability by Permaculture facilitators in the school is similar, but the rating for each sustainability dimension of the object is different, creating a tension in terms of the intended and actual outcomes. This constitutes a primary contradiction.

6.3.1.2 Between short-term benefits and long-term interests

All three interviewees cited below underlined the tension that often accompanies decision-making for farmers interested in sustainable agriculture. They must almost always remember to consider and address both the short-term benefits and the long-term interests.

Facilitator: The main challenge is that it takes time for the results to show. Farmers are used to quick results and conventional farming is very good at that. Permaculture feeds the soil so that the soil feeds the plant and it takes a while to build good soil. With chemical fertilizers, you can just buy today and apply the following day and changes will show in a few days. Some of the benefits in Permaculture are not visible, at least not in the immediate future. An example is recharging water tables through swales and other water harvesting techniques. (Interview #Z3)

The comment above suggests that those farmers interested in short-term benefits are likely to get drawn towards conventional agriculture, which delivers short-term benefits. The same point is echoed in the statement below:

Researcher: What kind of challenges are you facing in promoting Permaculture or Integrated Land Use Design as you call it?

Facilitator AM: The main challenge is concerned with its acceptance. At times this does not come easily. One key reason for this is that Permaculture does not bring immediate results in contrast to modern agriculture. This discourages some people. We try to overcome this by conducting look and learn visits to other schools so that participants can see that it is possible. (Interview #Z1)

The Permaculture facilitator cited below brings in the object oriented nature of making the choice by referring to the need for a vision towards which someone, a farmer works. He suggests that without such a conscious effort, it becomes difficult to postpone gratification.

Researcher: What kind of tensions have you encountered in promoting Permaculture?

Facilitator: Something to do with combining the short term with the long term. You see, it can only make sense when it is part of a vision. The big picture is missing in the training among farmers, which makes it difficult for them to do those things that bring benefits in the long term. The big picture is missing because there is no general farmer education, looking at the big picture such as dangers of dependence so that farmers understand where they stand. To apply Permaculture and other forms of sustainable agriculture you need motivation as a foundation. It is that level of awareness, which is helpful especially for implementing longer term things. It is about understanding the why. (Interview #Z4)

The contradiction that arises from short-term and long-term interests is associated with the outcome of a practice and therefore with the object. It is therefore another kind of primary contradiction, primarily pitting economic against ecological interests.

6.2.1.3 Between principles of ecological practice and expedient high external input agriculture

Even though Permaculture farmers are keen to use ecologically sensitive pest control mechanisms, some are tempted to use pesticides that kill the pests and also the pest predators, which help in pest control. This tension has been attributed to the desire for seeing immediate results as well as to what farmers have been historically accustomed to through conventional agriculture as the statement below reveals:

Facilitator/farmer: If a farmer has a pest problem and you give him a pest repellent, he is not satisfied to see the aphids run away. He wants them dead. That is what they are used to. (Interview #Z3)

A similar issue is raised by another Permaculture facilitator, who brings in the additional dimension of the strong temptation to use chemical fertilizers which feed the crop but do not feed the soil and its ecology:

Researcher: As someone trained in an agricultural discipline, what reservations do you have about Permaculture?

Facilitator AM: None really. The main challenge is that the results take time to come. One needs to build up the fertility of the soil. Chemical fertilizers on the other hand bring immediate results, so do chemical pesticides. (Interview #Z1)

While the idea of using chemical fertilizers among sustainable agriculture farmers may seem unreasonable, one Permaculture facilitator makes the point that when soils are too tired or generally lack nutrients, as is the case in many communal areas where people were settled during the colonial period, there may be justification for their use, at least for some time:

Facilitator: The other tension is around being too pure and not being pure enough. For example, in many agricultural environments of southern Africa the soil has become so poor that it is difficult to grow much without fertilizer. So there may be need to use chemical fertilizers as people move towards sustainable agriculture. (Interview #Z4)

The transitional period referred to in the above statement will vary from place to place. Where rainfall is high and biomass is readily available, the building of the soil will generally take a shorter time compared to an arid environment where decomposition will take longer (Savory, 1990). The contradiction between the tool producing activity system and those of the central activity system as discussed here constitutes a quaternary contradiction.

6.3.1.4 Between individual-isolated and joint-continuous learning and practice approaches

In traditional agricultural practices of Zimbabwe, farmers had mechanisms for learning from each other through such events as *nhimbe* – the periodic working together of farmers in a given community to work on someone's fields for no pay and *Zunde raMambo* – the collective planting, weeding, and harvesting of crops in fields dedicated for potential bad times. The arrival of conventional agriculture, the market economy and the dominant research-design-develop-assimilate approach reduced farmers to consumers of knowledge generated by other people (see Section 2.5.1). Sustainable agriculture seems to require the farmer to play multiple roles, including innovations, questioning, challenging and sharing their experiences with extension workers and agricultural experts as the interview below shows:

Farmer Mu: *There is one kind of investment which is very important but which people tend to undervalue. This is investment in relationships and socialising. It is from these relationships that we learn to move forward. You came here. I establish a relationship with you. I learn from you and you learn from me.*

Farmer AB: *In fact, some of the things that were taught I already knew about, but it was good to have someone confirming that they made sense, that they were right. You see, it is like in the past there were n'angas [traditional healer] assisting people who had problems; nowadays we have mapositori [a Christian denomination]. If you remain as the only n'anga, you can feel so isolated that you begin to lose confidence in what you are doing. (Interview #Z2)*

The second statement made by a farmer during the interview cited above suggests that farmers value interactions with other people because this helps them with sense making and confidence building. But currently such interaction tends to be ad hoc and one-off, which poses challenges for those farmers seeking continuous learning and improving with others, as the following interview with a farmer who is also a facilitator, illustrates.

Researcher: *What learning and teaching challenges do you face?*

Farmer/facilitator: *For me the most frustrating thing is when we go far to train farmers and never have an opportunity to follow up. I did this once recently when I taught a group of farmers in Mashonaland Central. There is no way of telling whether the learning is being applied. What could easily happen is that the farmers did not get something right and they practice it and it does not work. They may conclude that the whole Permaculture doesn't [work]. There is need for post-training support. (Interview #Z3)*

Accompanying farmers in their learning processes through follow-up and post-training support is good but not sufficient to ensure farmer-centred learning. Local structures to drive such learning processes are necessary as the following conversation reveals:

Researcher: *What can be done to improve learning of Permaculture among farmers?*

Facilitator: *One of the keys is to try and get farmer education happening among farmers on a continuous basis. Farmers need to have their own study groups. There is need to develop a culture of learning at farmer level. This is how farming improved in Europe in the late 1800s and early 1900s. The idea of folk schools in Denmark is a case in point. It supports ongoing learning among small-scale farmers. Learning is a long process. (Interview #Z4)*

Another way of expressing this contradiction is that it is one between practice that requires ongoing collaborative learning and the current fragmented farming learning systems. The contradiction of the individual and the collective can be primarily seen as one that is relational and existing among the subjects, which makes it a primary contradiction. However, in cases where the lack of cooperation exists between subjects, such as farmers, and tools, such as Permaculture facilitators, the contradiction becomes secondary as it then exists between two elements of the activity system. In this case, there appear to be both layers of contradictions.

6.3.1.5 Between ecological affordances and socio-economic multiple farming needs

In Zimbabwe seasonal rainfall has influenced agricultural practices in many ways, one of which is that farmers do not herd their livestock in the dry season. They roam freely and often find their way into winter gardens, destroying crops. There is therefore a tension between grazing management and crop production which currently tends to disadvantage crop production in the dry season:

Facilitator: *The challenge people face in practising Permaculture in a farming situation is associated with Zimbabwe or other countries in southern Africa having seasonal rainfall. It is more complex because it makes zoning difficult. The whole livestock thing is difficult. It is difficult to do whole land designs because in the dry season, animals roam freely and one cannot protect trees and other vegetation from being browsed or grazed... The other thing is the water. Whereas in areas where water is not an issue, you can grow a lot of plants at the same time, when water is little, biodiversity is compromised because you must remove some plants ... This is especially the case in a dry season. (Interview #Z4)*

Seasonality in Zimbabwe also means that there is inadequate water during the winter season. Most small-scale farming is rain-fed and the desire for continuous food production is undermined by this climatic condition, which is worsened in drought years.

Researcher: *Coming back to challenges, what gaps or problems do you face in promoting Integrated Land Use Design?*

Facilitator AM: *The two main problems are not getting enough manure to support the production of crops; and the limited availability of water, especially in the dry season. We have tried to address the water shortage problem by encouraging the construction of water harvesting facilities and by providing cans and other watering tools. (Interview #Z1)*

The contradiction between ecological affordances and the socio-economic and multiple farmer needs can be seen as a secondary contradiction between rules and the object.

6.3.1.6 Between surplus produce and market conditions

The contradiction associated with transport and marketing on one hand, and surplus production of agricultural goods by Permaculture farmers on the other, became a central matter during the CL workshop and evidence of this is drawn from that workshop. The table below (Table 6.1) shows how the contradiction was conceptualised by farmers.

Table 6.1 Analysis of the supply-demand contradiction

Problem area	Causes	Effects	Trends
<ul style="list-style-type: none"> Marketing and transport 	<ul style="list-style-type: none"> Market identification of Permaculture produce Poor road networks Poor roads Fuel prices Lucrative businesses poor 	<ul style="list-style-type: none"> Low income Deterioration of perishables Perishables decay Buy expensive things No local markets Expensive transport Selling produce at a loss 	<ul style="list-style-type: none"> Problem has increased since production started Up to date produce is not marketed outside the locality 1994-2001 transport was good; 2002-2004, service was declining; 2005 to date, serious transport problems

6.3.1.7 Summary of contradictions

The supply and demand contradiction involved the farmers as producers and external markets as consumers since the farmers wanted to sell outside their immediate community. This contradiction therefore constituted a quaternary one. The contradictions in the farmer activity system in the SCOPE case study are represented below (Figure 6.1).

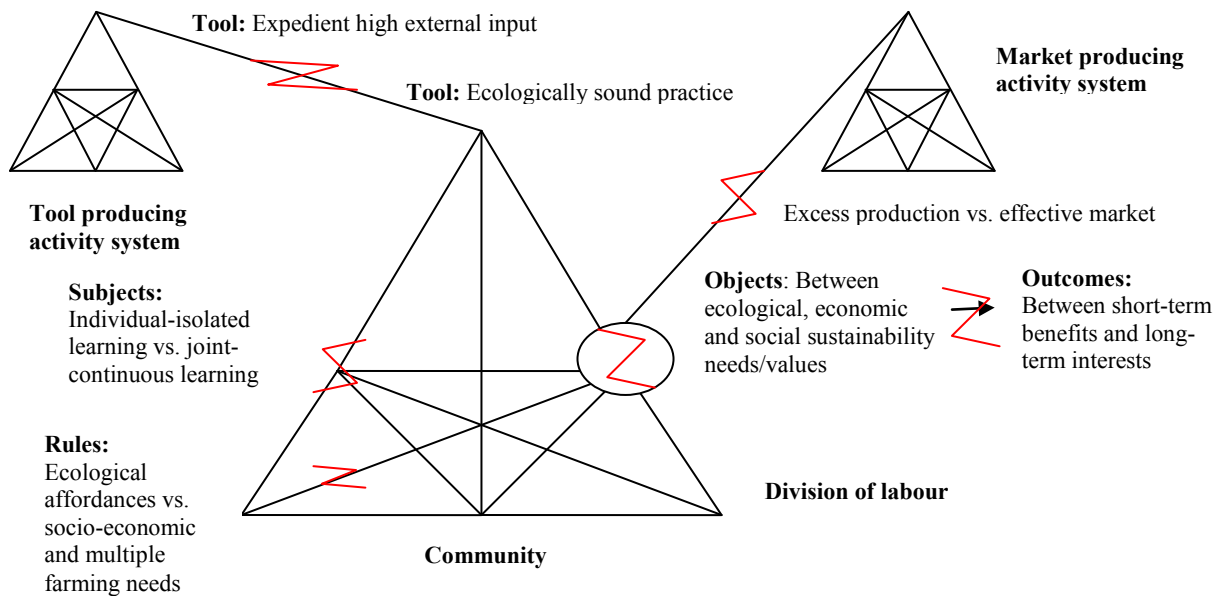


Figure 6.1: Contradictions in the SCOPE farmer activity system

Figure 6.1 above depicts the contradictions and their levels. The primary contradictions are:

- Individual isolated vs. joint and continuous learning;
- Competing ecological, economic and social dimensions of the object;
- Short-term vs. long-term interests.

The secondary contradiction is between the ecological affordances and socio-economic needs of farming. The two quaternary contradictions are:

- Excess production vs. effective demand; and
- Expedient high external input practices vs. the ecologically sound practices.

6.3.2 Contradictions in the St Margaret School activity system

The school activity system, whose subjects are Permaculture teachers and pupils, interacts with the central activity system of farmers around improving the learning and practice of Permaculture. There is some sharing of both ideas, experiences and planting materials. The school activity system is faced by three main contradictions as discussed below.

6.3.2.1 Between school-community learning needs and means of production and objects of formal curricula and structuring of modern schooling

Permaculture teachers in the St Margaret Primary schools are employed to teach pupils first and foremost. However, they have an extra-curriculum responsibility to teach neighbouring schools and farmers in the cluster system. Their challenge is how to meet both tasks effectively as the conversation below suggests:

Researcher: *What challenges or constraints do you encounter in running the course within one week?*

Facilitator CM: *Firstly, we can only run short courses because Permaculture training is not our core business as teachers. When we are not teaching our classes, someone else is asked to do that on our behalf. Parents and sometimes the pupils themselves do not like this. And we cannot be away from the class often, for too long. (Interview #Z5)*

The above shows that the object of SCOPE to integrate ecological principles into the curriculum and therefore environmental education in the school curriculum (Nyika, 2001) – an object yet to be attained is creating contradictions within the current activity system of the school. The kind of contradiction that exists here can be seen as tertiary because there is a tension between the object of the current school activity system and the desired future activity system which incorporates sustainability into the written and practised curricula.

6.3.2.2 Between conventional agriculture messages and Permaculture sustainable agriculture messages

When Permaculture facilitators engage with farmers they soon realise that they are giving them certain messages which conflict with those from the government extension system, which is built on conventional agriculture thinking. This tension is reproduced at farmer level as ambivalent messages.

Farmer/facilitator: *We have in the past experienced clashes with Agricultural Research and Extension staff who promote agriculture with different principles from those of Permaculture. Fortunately, more recently, the curriculum of agricultural colleges includes sustainable agriculture. So the clash is less frequent now, especially with new graduates. The old guard still poses problems though. The problem remains that when we talk about the bad effects of agro-chemicals we appear to undermine what Agricultural Research and Extension generally promotes. (Interview #Z3)*

Ambivalent messages from conventional agriculture and sustainable agriculture which were also identified in other parts of Zimbabwe (Pesanayi, 2008), constitute a quaternary contradiction between the tool-producing activity system (such as colleges which produce graduates and companies that produce agro-chemicals) and the central school activity system.

6.3.2.3 Between mediating tools and object of production

One of the main problems that the school was facing during the study was a drop in production, because water could not be pumped for use in the school garden. This not only reduced crop production in winter but also seriously undermined income generation through sales. The nutrition garden to support orphans in the school was being equally affected. The water problem was traced to a problem of electricity. But the real tension appears to lie in a choice between locally available energy resources and those which are externally supplied.

Facilitator CM: *One of the problems that we are facing now is the erratic power supply, which means that we cannot water the garden as regularly as we would like.*

Facilitator MY: *In 1996 we received a donation from the former Minister of Agriculture's wife in the form of a tank, which we use for storing water. It is essential for those zones needing regular supply of water. In 2002, we received an engine that pumps water and is driven by electricity (Interview #Z5).*

During the CL workshop, the school had no electricity, which they need for pumping water, which is then used for gardening activities. This undermined production substantially. The contradiction between the mediating tool of water and energy and of the object of production is a secondary one as depicted in Figure 6.2 below. The contradictions in the St Margaret Primary School activity system are shown in the figure below.

6.3.2.4 Summary of contradictions

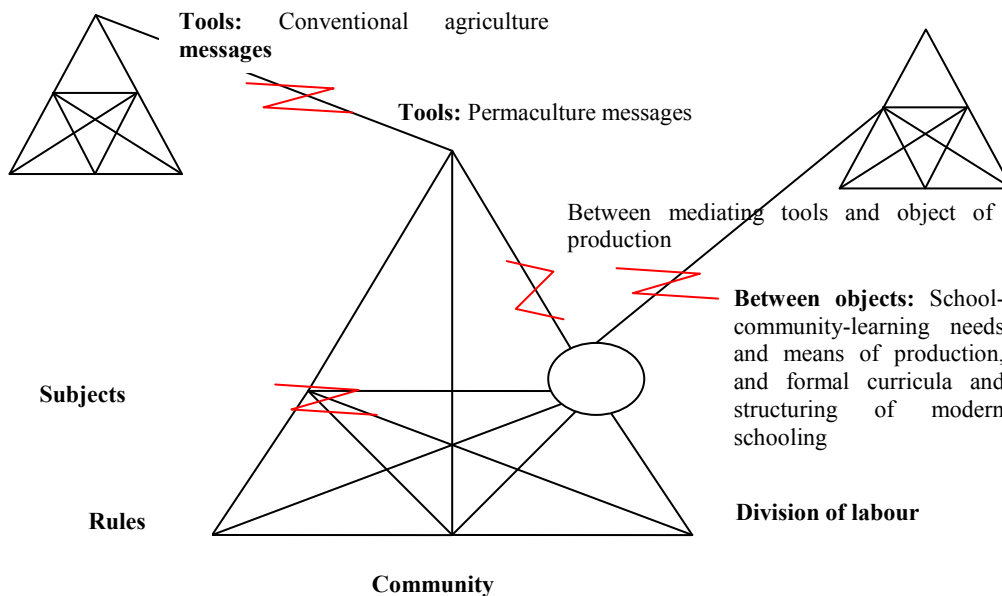


Figure 6.2: Contradictions in the St Margaret Primary School activity system

The above figure shows the three kinds of contradictions identified in the St Margaret School activity system:

- Secondary contradiction between mediating tools and object of production;
- Tertiary contradiction between formal curriculum object and intended curriculum object; and
- Quaternary contradiction between tools used for mediating learning and production in the school and those coming from formal agricultural systems.

6.3.3 Contradictions in SCOPE, the national programme

SCOPE can be seen as an NGO that promotes integrated land use designs in schools (Nyika, 2001; SCOPE, 2004). The schools then serve as a working model for the surrounding communities. Their intervention strategy includes the training of both school teachers and selected farmers from the community. SCOPE therefore has both a direct and an indirect interaction with the Permaculture farmers' activity system. SCOPE also introduced a country-wide cluster system where about eight schools in each cluster, work under the mentorship of a successful Permaculture school. This has placed added responsibilities on Permaculture teachers in the more successful schools who must serve both their school and communities and those of neighbouring schools in the cluster system. Two contradictions were analysed.

6.3.3.1 Between introduction of change oriented sustainability practice and the available capacity to make it work

SCOPE runs two-week courses for its Permaculture facilitators, who then run a one-week course for farmers and other teachers in the targeted schools. Some refresher courses are provided to the Permaculture facilitators. One of the main issues for this „tool producing“ activity system has been to produce adequate and well trained Permaculture facilitators without the necessary resources to do so. This challenge is a common one among NGOs promoting sustainable agriculture in the country as revealed below:

Facilitator: The challenge is that there are a lot of novices promoting sustainable agriculture, who must get their act together to offer more comprehensive education and training...
Facilitator: Permaculture is new and it takes time to develop skills to manage diversity. Two weeks is not enough. This is why we developed the idea of an apprenticeship programmes where people learnt and implemented Permaculture for a period of two years. One of the challenges was that the training was not registered with the relevant ministry so people were not very keen to do the course and not get a recognised certificate in the end. Nevertheless, we trained a number of groups, three or four, each with about six trainees. This was another constraint, the cost. A trainer had to work with only six trainees at a time ... Thinking about it more I really see this as a big issue - the need to develop longer term training and I think distance education is the way, combined with workshops now and again. (Interview #Z4)

The newness of Permaculture in the country makes it a suitable practice for interrogation using CHAT because new things, new practices tend to generate contradictions (see Sections 1.5 and 3.4.4), which are potential areas for learning and development. During the CL workshop, the contradiction of under-supply of Permaculture facilitators against a growing need for them was ranked as one of the five most important contradictions but could not be dealt with because participants felt it was outside their sphere of influence. The dynamics would have been different if SCOPE had representation in the workshop. From this process, it would appear that the presence of representatives from an activity system is important to

generate a nuanced understanding of the contradictions they face and that re-presenting the absent may not be adequate.

In the above discussion, the capacity to deliver can be seen as mediating tool while change oriented learning and practice can be seen as the object. This makes the contradiction a secondary one.

6.3.3.2 Between mediating language and farmers as learners

One of the core functions of SCOPE is to support the learning of pupils, Permaculture facilitators and farmers; however, the learning materials in use are not adequately tailored to suit the situation and needs of farmers that it works with and this raises a learning tension. The materials are written in English and designed for trainers not farmers nor pupils, as the three interviewees argue:

Facilitator CM: The other challenge is that the language in the handouts is too advanced for the readers. It may also need simplifying in English. The language is for intellectuals. Participants have to rely more on listening to the facilitator.

Facilitator LM: The other challenge we face is that of breaking the content to suit the participants. This challenge is further compounded by the fact that we often have a mix of participants, pupils from Grades 4 to 6; parents and teachers. (Interview #Z5)

Researcher: What language do you use in training and in the resource materials?

Facilitator AM: English. I would like to produce some of the materials in the local language because most of the ultimate users would find them more useful. I would also like to include more visuals in the materials than is the case now because visuals help people understand ideas better and faster. (Interview #Z1)

Facilitator: The materials we used for training were basically tailored for trainers not for farmers. This is a problem not only in sustainable agriculture. It is a general problem. (Interview #Z4)

The contradiction between language as the mediating tool and the farmers as learners from another activity system constitutes a quaternary contradiction.

6.3.3.3 Summary of contradictions

The two contradictions identified in the SCOPE activity system are represented in the figure that follows (Figure 6.3).

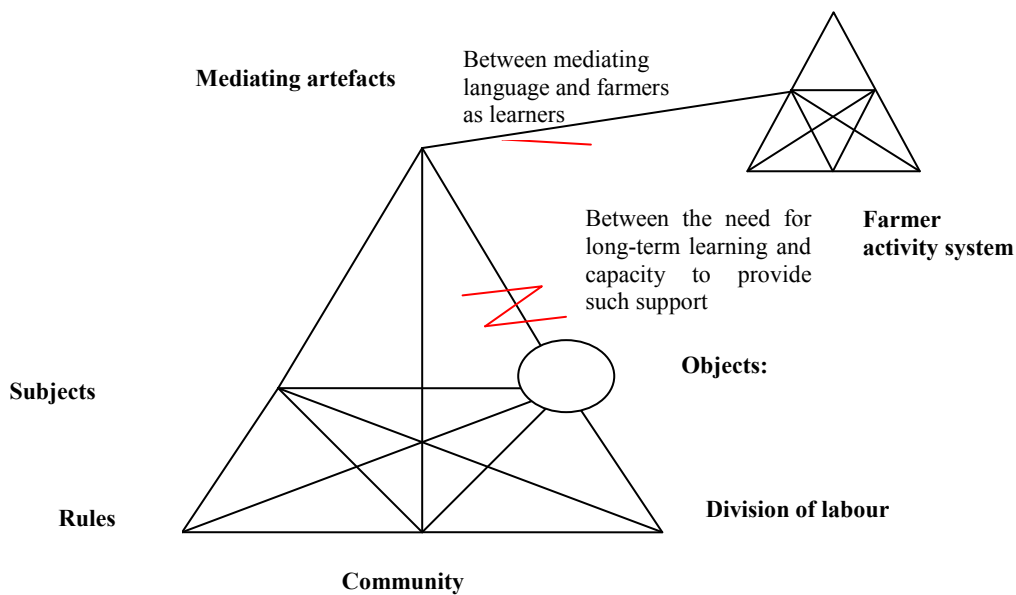


Figure 6.3: Contradictions in the SCOPE activity system

6.3.4 Conclusion on contradictions in SCOPE case study

The study identified several contradictions in the three activity systems (see Table 6.2). Some of the contradictions in one system affect the others. For example, the tension between resources available and the need for long-term training of Permaculture facilitators limits the quantities and quality of Permaculture facilitators available to farmers.

Table 6.2: Summary of contradictions in the SCOPE case study

	Farmer activity system (in St Margaret School community)	St Margaret Primary School	SCOPE national
Primary contradictions	<ul style="list-style-type: none"> • Between ecological, economic and social sustainability needs in the object • Between short-term benefits and long-term interests • Individual-isolated learning vs. joint-continuous learning 		
Secondary contradictions	<ul style="list-style-type: none"> • Ecological affordances and socio-economic needs of farming 	<ul style="list-style-type: none"> • Between mediating tools and object of production 	<ul style="list-style-type: none"> • Introduction of change oriented sustainability practices and available capacity to make it work.
Tertiary contradictions		<ul style="list-style-type: none"> • School-community learning needs and means of production, and objects of formal curricula of modern schooling 	
Quaternary contradictions	<ul style="list-style-type: none"> • Demand-Supply of agricultural produce • Expedient high external input principles and ecological farming principles 	<ul style="list-style-type: none"> • Ambivalent messages from conventional and sustainable agriculture facilitators 	<ul style="list-style-type: none"> • Mediating language of SCOPE and the farmers as learners

The contradictions identified in the three activity systems in Case Study 1 are historically, culturally and materially shaped. For example, the bad roads and lack of access to district and national markets could be traced to the national socio-political and economic environment of the country at that time, where the government tax base shrunk as only less than 10 % were employed and many industries had closed. The farmers were settled in this area after the creation of reserves for indigenous people during the colonial era and they were settled in less fertile areas where the rainfall was relatively low (Rukuni, 1994). The use of English as the medium of learning can also be traced back to the colonial era's use of English as the national language. Many of the farmers did not go far with formal education for reasons that include inability to afford the educational costs. The school curriculum of Zimbabwe was based on the British system for many years, which underlined the importance of formal and western knowledge. The failure of the Education with Production philosophy and its association with the less capable also undermines efforts at introducing change oriented sustainability learning and practices (Chigwedere, 1998). A noteworthy observation in the CL workshop and feedback meetings that were held in Case Study 1 is that no woman farmer attended (see Section 5.7.3), which could be related to work affordances in gender relations. The theft of electricity cables in the St Margaret community, which contributed to the disruption of power supply and was attributed to community ignorance and irresponsibility by research participants, can be traced to the liberation struggle in the country. Aeneas Chigwedere, historian, education and Minister of Education and Culture for some years, in his book *Abandoned Adolescents* (1998) pointed out that the liberation struggle taught people that government property belonged to the enemy and had to be treated as such but when independence was attained, there were no processes of unlearning this. Consequently and ironically school buildings, phone booths, dip tanks and other forms of infrastructure seen as public property, are still being treated as enemy property.

6.4 CONTRADICTIONS IN THE ORGANIC FARMING, ISIDORE COMMUNITY, SOUTH AFRICA

In Case Study 2, contradictions were surfaced in three activity systems: organic farmers; organic facilitators; and organic marketers (see also Section 5.2).

6.4.1 The farmer activity system

The farmers who were involved in the study ranged from those using small plots in groups to those with as many as four hectares. Altogether, five farmers were involved in the research. Two of the farmers were also involved in other activity systems in the study. Their experience in sustainable agriculture ranged from a few years to 40 years. Four contradictions are discussed here.

6.4.1.1 Between the ecological, economic and social objects of the practice

Some of the discussions we held around the issue of needing to address the three sustainability dimensions of sustainable agriculture revealed the contradictory nature of the object.

Researcher: *Now if you were to score out of 10, these three aspects, of the ecological, economic and social, how much would you score the kind of farming that you are practising, out of 10?*

Entrepreneur: *Ecological rating I would score it at – 10 out of 10 is nature, 10 out of 10 is somewhere in the bundu where nobody is doing anything but because we have to eat, ours will have to score 9 out of 10 because we are still manipulating a natural system to a certain degree because we have got to eat and we are putting crops in there that aren't indigenous and we are using nature to sustain ourselves.*

Researcher: *And economic?*

Entrepreneur: *That depends on which year you are in. Year 1, you get 1 or 2 out of 10 because you are able to eat some lettuces because you don't have to spend money buying some lettuces. And I would say year 15 or 20, I would say 9 or 10 out of 10. But that depends so much on the individual. It depends on where your own values lie. If you want to drive a Jaguar, this is never going to be a 10 out of 10 for you.*

Researcher: *How about addressing social issues?*

Entrepreneur: *10 out of 10.*

Researcher: *Can you explain the score?*

Entrepreneur: *When people are growing things and when people in communities are growing stuff, to stay in the community and you are doing it properly, you are involving other people in the community, poverty doesn't exist. And if you have got food and your food is poison and pesticide free and your community isn't riddled with disease, immune diseases and deficiencies, your brain power will be so much better, your community will be so much better. (Interview #SA1)*

The above conversation underscores the need to consider time when assessing the relative values of sustainability. This suggests that judging a practice too soon could unduly disadvantage it. Worth noting is the fact that the economic dimension got the lowest score in the above interview as well as in the following two interviews. This seems to suggest that the zone of proximal development for organic farming in the case study (as well as of MFS and Permaculture in the other case studies) may be related to the economic dimension of the object.

Facilitator: *In terms of social out of 10, I give 7 and environment, I give 10 out of 10 and then in terms of economic for a person who is in the rural area doing organic farming wants to do as a business is very difficult but I give 3... In terms of social, you are looking at the whole farming practice, socially its good for the person because I am looking at it from HIV perspective. Socially its good because is something you can do which really doesn't give you a bit of therapy you know is also for someone who has been bed-ridden for a long time, it really brings back that strength and also seeing your plants grow ... I think in terms of that, that is why I give 7.(Interview #SA5)*

Rau (2006, p. 37) noted that the immediate impacts of HIV/AIDS on farming communities are: loss of labour due to illness, death and caring; cutbacks in food available for

consumption; loss of income and increased medical and funeral expenses; loss of knowledge and essential skills for agriculture; and loss of assets.

Farmer: *Oh, I can give it 90%*

Researcher: *For the environmental value?*

Farmer: *Yes.*

Researcher: *For the economic?*

Farmer: *And for the economic, 60%.*

Researcher: *And for the social? About how it is good to the people and how it helps the ordinary person how much would you give it?*

Farmer: *Percentage?*

Researcher: *Yes.*

Farmer: *It's 100% for social although it is for those that are poor. (Interview #SA3)*

6.4.1.2 Between economic viability (short-term) and ecological soundness (long-term) of farming

The ecological logic of time and the logic of economic benefit (immediacy) also clash within organic farming. It takes far longer to build the ecology of the soil so that it supports production to a level where business may be considered viable. The transitional period in organic farming goes beyond improving the productive potential of the land to include safety dimensions, which is why there is a re-conversion period in cases where the land was under conventional agriculture.

The interviewee cited below explains how it is problematic for farmers to meet organic farming conditions and the role that standards and policies play to create this contradiction:

Facilitator: Organic farming, it's a good thing. It's just that we still have a long way to go... it's the very slow process. ... The agents that certify organic farming in SA we don't have that many, and find that the people who influence our certification are the European ... The whole process is not straight [forward] for someone who is not as intellectual [about it] as in the rural[areas]...[People] can't read or write it [and] becomes ... a challenge for them you know so with that regard it's really sad we don't have our own accrediting agents to grade our farms ... All these policies come here, they want the products they are very strict. I mean we are still a new country and we need to integrate things slowly but then yes, there is a future definitely for organic farming but it's a very slow process...And another problem is not exactly in teaching but in production ... because we doing organic farming we find diseases and pests, if you use organic method they are not as effective as your chemicals because if you put chemicals now, tomorrow there is nothing ... but then when it comes to [organic farming] the result, they take a very long time, so that is another thing I find as a problem, even when you have aphids in cabbage. (Interview #SA4)

Using her personal experience, one farmer/entrepreneur explains the challenges she encountered in moving towards viability:

Researcher: *What difficulties would you say you have faced in the learning of Permaculture or organic farming and its practice?*

Entrepreneur: *I would have to say a biggest obstacle would be trying to convert organic farming into a financial sustainable project in too short time. We also at beginning thought*

we will do like quick, quick but it wasn't going to work... We've been doing a lot of soil feeding and all of that at the beginning we did try quickly turn to a profit by overnight, quickly putting in crops and harvesting but we encountered many difficulties with that because our farm, infrastructurally, wasn't ready. Our farm labourers, everybody had to be taught the way our system was, but it didn't happen overnight. Our own learning on our own particular farm... it took much more time than we estimated. (Interview #SA1)

This shows that productive capacity is not just material and physical, that is good soils and adequate water supplies but also social capacity to perform agriculture and economic capacity to be able to both invest in and generate viable business.

6.4.1.3 Between external organic farming rules and the socio-ecological conditions of farmers and farming

Small-scale farmers living in communal settings and who are interested in organic farming face further challenges, between the organic farming regulations and the size of their land, which does not allow them to raise the necessary registration and membership fees. However, there have been a few instances where this tension has been resolved as explained below.

Researcher: In terms of time investment, how much do you need to spend with the farmers so that they become competent?

Facilitator: To get to be certified as an organic farmer you need to pay anywhere between 20,000 and 30,000 rand just to make the application. Inspectors come to see your place, and they decide if you are not organic, which programme to embark on to get organic. And then the annual inspection fee costs another 20,000 rand. Now, if you are a small-scale farmer who has got 3-4 ha of land, can you imagine paying 20,000 rand, you can't afford it. So the way we thought about it though the Rainman Landcare Foundation is that you set up all the organic small-scale farmers into an organic cooperative and you certify the group only as organic but in order to do that, you have got to choose the key people in the group. A good example is Mvulo Farmers Association, which has got about 200 members, who each has got anything between 1-5 ha and there is a leadership group that were trained as internal inspectors. (Interview #SA8)

The contradiction that arises from the above discussion is associated with small-scale producers in much of the region not having ready markets in their own areas where standards and regulations for organic produce can be locally determined to take account of socio-ecological conditions. The internal market capability is therefore weak and causing clashes with the external market power, largely located in the developed world at the moment. This formulation of the contradiction makes it a quaternary contradiction. Having discussed this contradiction in this light, it is important to note that the Participatory Guarantee System has been designed by IFOAM as a response to this contradiction (see Section 2.5.5.2). Chapter 7 discusses how the research participants in Case Study 2 decided to use this mechanism to address this contradiction.

6.4.1.4 Between agricultural messages brought by conventional agriculturalists and those brought by sustainable agriculturalists

Farmers live in a community where both high external input agriculture extension workers and low external input facilitators exist and compete for their attention. In the process, they receive conflicting and ambivalent messages. The interview below suggests that there are reasons behind the messages which make organic farming a contested practice.

Farmer/facilitator: And after years and years and years it has come down to the actual issues that we are facing sort of being disseminated and the realisation of the social issues and the cultural issues, the lack of desire to farm, the sort of negative attitude towards farming, you know the attitude of people they become a major inhibiting factor. People who didn't want to be, who didn't perceive being a farmer – there is evolution in their society. Evolution was perceived along entirely different lines of western or industrialised culture, technological advance, education of course and agriculture was in many cases in my experience seen as a step backwards and not a step forward, especially with this concept of ecological agriculture, not utilising the technological advances of the pesticide industry, not embracing the technological advances of genetic spicing and genetic manipulation, fertilizers, superphosphates, things like this. (Interview #SA2)

But another farmer/entrepreneur cautioned against throwing the baby out with the bath water. There are many good things to learn from conventional farming, and this essentially, is what expansive learning seeks to do, to move beyond either/or.

Entrepreneur: Definitely, some things like we say Permaculture that we definitely learn stuff out of the practicality of conventional agriculture and monoculture. There is reason why they do things the way they do things. So by blocking out of that side of things you are actually blocking a door to learning ... We tried it but didn't work for ourselves and for sake of our people work the land for us, needed more organised system and we certain realize that the reasons why they do this like monoculture system are for certainly for practical reason. One of them has been harvesting. (Interview #SA1)

The quaternary contradiction discussed above comes across to farmers as ambivalent messages (Pesanayi, 2008) who are at the receiving end of them because of the manner in which they are discussed. This contradiction raises an issue of what constitutes sustainable agriculture cognition, which is discussed in Chapter 8 and Chapter 10.

6.4.1.5 Summary of contradictions

The main contradictions that were identified in the organic farmers' activity systems are depicted in the figure below (Figure 6.4).

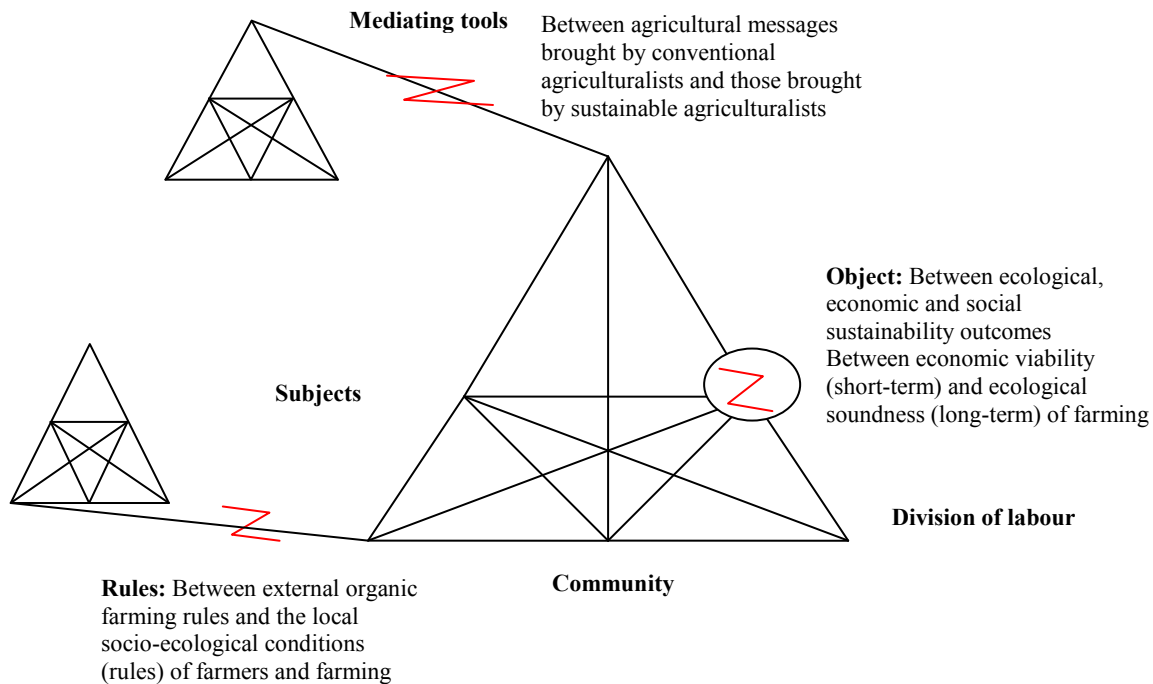


Figure 6.4: Contradictions in the Isidore Organic farmer activity system

The four main contradictions identified in the farmers' activity system of Case Study 2 are:

- Two primary contradictions: one concerned with the three competing intended outcomes and the other concerned with short-term economic viability and long-term sustainability; and
- Two quaternary contradictions: one between the external market demands and the internal market capability; and the other between messages on high external input agriculture and the internal input ecological agriculture.

6.4.2 Organic facilitator activity system

At least four organic farming facilitators were involved in the study. In addition, there were six trainers and development workers with an interest in agricultural and developmental education who attended the CL workshop where „mirror data“ was presented (see Section 7.4). Two main contradictions were identified in their activity system. The contradictions have an impact on farmer learning and practice of organic farming.

6.4.2.1 Between the pedagogical strategies employed and farmer learning and practice needs

The quality of training that organic facilitators are receiving so far does not seem to meet the needs of the farmers that they work with. This contradiction between knowledge supplied and demanded has a bearing on the quality of „delivery“, where facilitators are mediators in the learning of organic farming. An organic facilitator who received nine months of training and who also has an agriculture diploma qualification underlines the challenge:

Researcher: *How long were the courses and how many did you attend?*

Facilitator: *I first attended the two weeks course and then after that I attended facilitator course, organic facilitator course which ran for about nine months if I am not mistaken.*

Researcher: *Nine months*

Facilitator: *It was NQF Level 5 qualification, I did that so, that was only organic farming courses that I have done.*

Researcher: *What is your feeling on it for your training?*

Facilitator: *I still want to know more things about organic farming and when I am not sure about things I tend to refer some of our people, some of our patients [referring to HIV positive people with whom he works] to X so he does give them some skills and I also try to give them some skills and help them out. (Interview #SA4)*

The issue of quality of learning was also raised by another farmer who attended a different course, who complained about the quality of facilitators:

Farmer/entrepreneur: *I did a proper Permaculture course, a proper Bill Mollison accredited Permaculture course.*

Researcher: *How long was the course?*

Entrepreneur: *It was also only a seven or eight day course maybe two weeks. I can't even remember. It was actually a very incomplete course... The course was run by the people that were at that point also in the beginning of the teaching sort of career. (Interview #SA1)*

The contradiction raised in the above discussion occurs between the tools of learning and the object of the facilitators' activity system, which is the learning of the farmers. This makes it a secondary contradiction.

6.4.2.2 Between time and resources allocated for supporting farmer learning and time and resources needed for it

The quality of training has also been undermined by the time-resources tension, where there is need for a lot of time to learn the necessary skills but the resources are often not enough to allow for that amount of time. Courses run for farmers have not only been rather short, but also one-off.

Facilitator: *They were doing a three-day training course, down there and basically to show the people composting and how to make the ground capture the water, the basic principles because we thought, anyway, by culture, the African has been farming for thousands of years. I mean he was growing his food long before 1820 settlers and anybody else came onto this continent. So what are we trying to do? People know how to grow things, basically. What we are trying to say there might be a better way of doing it so you get better productivity out of what you put into the ground, try rotation and what have you.*

Farmer/Facilitator: *Three days. The expected results after a three-day workshop in agriculture pretty much amounts to exposure. It is not enough time to effectively... it is a very brief overview of agriculture, and in many cases results in information overload. (Interview #SA10)*

The interview cited under this tension of time and resources suggests that there is a limit to what can be covered in short learning courses, wherever they may be conducted.

Facilitator: *What Newlands has been doing, they have been going out directly to beneficiary communities. They go to people's homes, people's community gardens they train the people hands-on around their homesteads.*

Researcher: *How long does the training take?*

Facilitator: *Two to three days.*

Farmer/facilitator: *It's basic. It is actually implementation. The training involves you going in as a combining factor. If there are ten houses that need to be trained, you take those ten individuals and you start at the first house that is the first day of training. And you develop that first house, and the next day you develop the next house and the following day you develop the third house. Now you have three houses that are done and we go there with vertiver grass, seed packs. (Interview #SA8)*

The resources to enable farmer learning to take place come from outside the facilitators' activity system, mostly from government and this results in a quaternary contradiction.

6.4.2.3 Summary of contradictions

Figure 6.5 that follows shows where the contradictions are located within the organic facilitators' activity system.

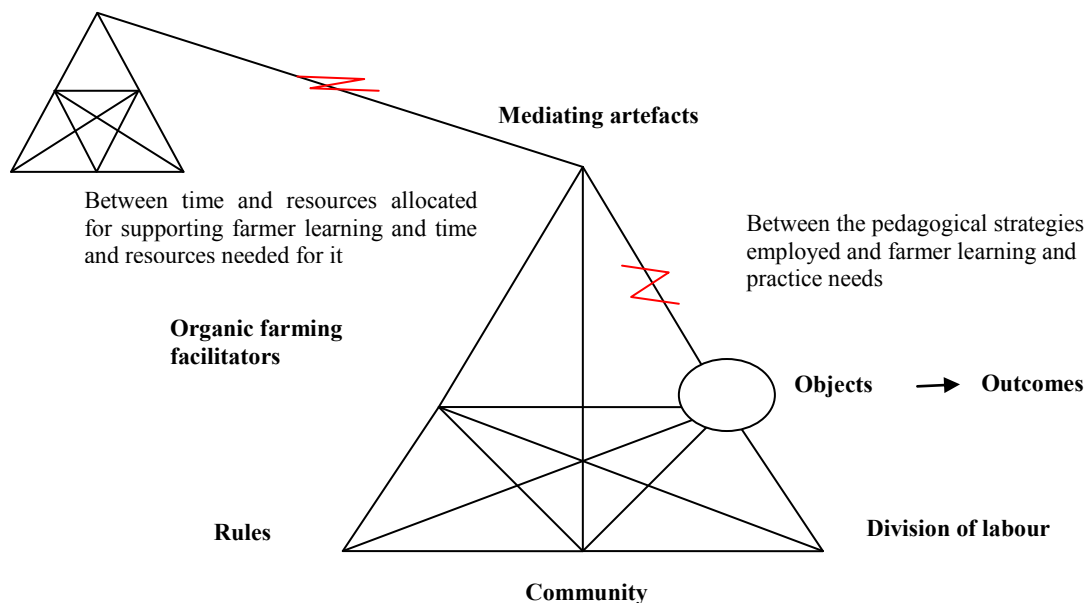


Figure 6.5: Contradictions in the Organic farming facilitator activity system

The two main contradictions discussed in the Organic facilitators' activity system are the secondary contradiction between mediating tools and the object of facilitation; and the other is a quaternary contradiction between the resource providing (a form of tool) activity system and the central activity system of facilitators.

6.4.3 Organic entrepreneur activity system

Two organic farming entrepreneurs were involved in the Isidore Organic Farm case study and they work together. Their business experience in the sector spans nearly ten years. An interview conducted with one of them shows how they have encountered tensions and resolved them, and this will be discussed towards the end of this chapter (see Section 6.7, Table 6.5). One of the contradictions is discussed here.

6.4.3.1 Between seasonality of local vegetable production (ecological affordances) and daily demand for them (human wants and needs)

The study site is located in a seasonal rainfall area where most of the farmers do not use irrigation facilities. Certain vegetable varieties do not do well during the rainy season. The conversation below describes the nature of a contradiction that was encountered in the past and how it was dealt with. However, I have raised it as a standing contradiction here because the current solution of importing is likely to face the problem of fuel costs in future, especially given the pressure for cutting down on greenhouse gases.

Entrepreneur: And then the market in Durban they also reached their ceiling because the veggies [vegetables] are very seasonal, the income was very, very determined by what season we were in. When we went to the winter season, spring it was great but the minute you go towards the end of summer became not sustainable because the vegetable production went down very, very badly because here in this region, the end of summer is like the middle of winter in Europe. We haven't put, it's too hot to put the new crop, the new baby seedlings in and the old stuff is going out so we haven't got succession throughout the rest of the year there is the succession from about February but its pushing it already. January, February, March, April, there is very dry period in vegetables. We had to find another route. (Interview #SA1)

Seasonality is a material factor which determines what can be produced and therefore serves as a rule, which clashes with the object of the entrepreneur to get a continuous supply of vegetables and be able to generate income throughout the year. This results in a secondary contradiction.

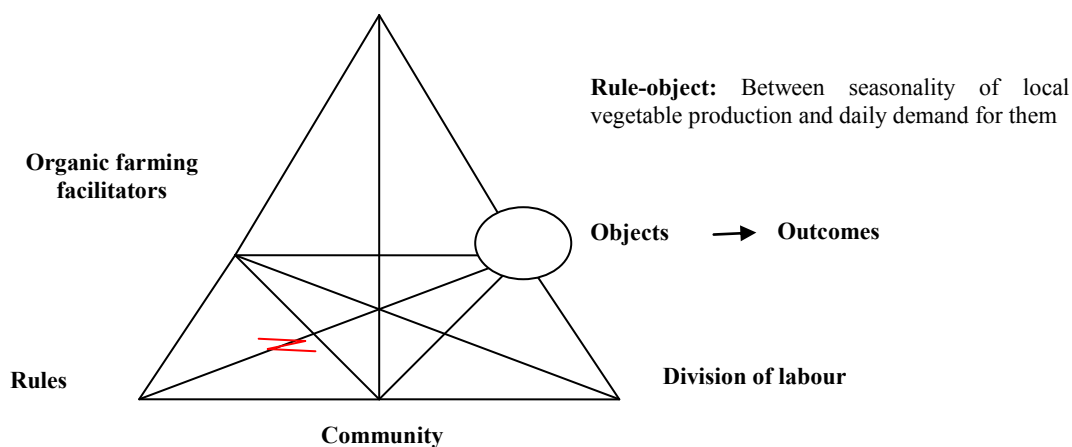


Figure 6.6: Contradictions in the small-scale organic entrepreneur activity system

6.4.4 Conclusion on contradictions in the Isidore case study

The contradictions discussed in the Isidore case study are several but not exhaustive as is the case with the other two case studies. Table 6.4 below summarises the contradictions and their levels. It is also interesting to see how the contradictions were reconceptualised during the CL workshop when participants defined a shared object (Chapter 7).

Table 6.4: Summary of contradictions in Isidore case study

	Organic farmers	Organic facilitators	Organic entrepreneurs
Primary	<ul style="list-style-type: none"> Between time needed to make money and time needed to build the productive capacity and safe production of food. Between the ecological, economic and social objects of the practice 		
Secondary		<ul style="list-style-type: none"> Between the pedagogical strategies employed and farmer learning and practice needs 	<ul style="list-style-type: none"> Between seasonality of local vegetable production and daily demand for them
Quaternary	<ul style="list-style-type: none"> Between messages agricultural messages brought by conventional agriculturalists and those brought by sustainable agriculturalists Between external organic farming rules and the local socio-ecological conditions (rules) of farmers and farming 	<ul style="list-style-type: none"> Between time and resources allocated for supporting farmer learning and time and resources needed for it 	

The contradictions identified in Case Study 2 show the significance of socio-ecological considerations in the different activity systems. The ecological affordances have implications on what might be imported or on the flow of certain types of produce. The case also illustrates how externally set standards of organic farming, which are implemented largely by outsiders can fail to achieve their ends due to not taking full account of local realities. The introduction of Participatory Guarantee Systems (see Section 2.5.5.2) however serves to illustrate the reflexivity being exercised in the organic movement. Economic and cultural capital affordances, which are limited among small-scale producers in the case under review, appear to result in wrong or inadequate mediating tools by facilitators. The clash between conventional and organic agriculture messages, which is evident in the case study suggest that there is potential for learning and development from each approach (see Section 8.4).

6.5 CONTRADICTIONS IN THE MFS CASE STUDY

This case study focuses on three activity systems: the farmer activity system the MFS promoting activity system and the government agriculture extension activity system. The analysis is based on data gathered from MFS facilitators and farmers during interviews and the CL workshop held with them as well as from document analysis.

6.5.1 Contradictions in the MFS farmer activity system

As discussed in Chapter 4, over 30 MFS farmers participated in the study, most of them through two group interviews and others through CL workshops. The farmers practise in two districts of Lesotho, namely Mafeteng and Mofale's Hoek. They have been practising MFS for at least the past four years but others for far longer. Data generated from interactions with them suggests that they are facing several contradictions in their learning and practice of MFS. Six contradictions are discussed here (see Sections 6.5.1.1 to 6.5.1.6).

6.5.1.1 Between balancing the social, economic and ecological values of MFS practice

The conversation below suggests MFS is addressing the three sustainability objects relatively well and that the area with the lowest score and therefore the greatest need for attention is economic sustainability.

Researcher: Now, if you were to rate the MFS in terms of its economic value and contribution, its environmental or ecological value, its social value, how would you rate each of these three out of 10?

Facilitator: Yes, let me start with the social, the MFS talks and encourages and practises, mafisa. In that way, it unites people who live in the same area and have the same problems, to work together, to help each other. We always tell the people that you cannot solve your problems alone. You can't. It's either you do it with your family, you do it with your kith and

kin, or you do it with your neighbour. ... I think we have it in all our African languages – „A man is a man because of other men”²¹, something like that.

Researcher: *So out of 10 how much would it score?*

Facilitator: *Out of 10, I would score say 7, the social, yes. Now the economic one, which was the main reason why Ntate Machobane decided, to say let me sit down and see how we can help our own people to do things for themselves, to use locally available material for their own good, that is the first thing and also now to be able to produce more than the family needs so that you can be able to sell.*

Researcher: *So how much?*

Facilitator: *Well, I would give it six, 6.5.*

Researcher: *And the ecological?*

Facilitator: *The ecological take care of the basic natural resource. That’s also a Machobane cornerstone, Machobane philosophy. Don’t destroy what you use. Use it in such a way that next time, the next generation can be able to use it. We practise the rehabilitation of dongas, we tell the people to practice the growing of trees. Keeping the land always covered right through the year so that there is no erosion. Yes, that one we do practise but the results are not so good.*

Researcher: *Why is that?*

Facilitator: *The people they are told and they don’t implement or they do not do as they are told. Also there are these people now who come with all sorts of projects. They tell them do this, do that, do this, do that so that people end up leaving things just like that – getting confused.*

Researcher: *They get ambivalent messages?*

Facilitator: *Yes that is right ambivalent messages. But as a teaching of the MFS, it’s very good. Those who practise it, I would give eight, 8 out of 10. (Interview #L6)*

The contradiction that is evident here resides in the dialectical relationship that exists between the three-dimensional nature of the object of MFS, which is also the same as that of the other two activity systems. Farmers have to continuously seek to address the economic, social and ecological intentions of their farming. This is a primary contradiction.

6.5.1.2 Between long-term and short-term interests

The time logic in ecology and in economics cannot be synchronised in MFS and this creates challenges for farmers who want to achieve both at the same time. What tends to happen is that the farmer needs income here and now but the soils take years to build before they can support high productivity. This puts farmers in a Catch 22 position as they get tempted to use chemical fertilizers which produce immediate results. These points are well illustrated in the two conversations cited below:

Farmer group 1: *We are not saying conventional agriculture can be better than MFS. What we are saying is the use of organic manure needs time but if you plant on time, you get better results but if you are not on time – that’s why we need chemical fertilizer because it can push more faster than organic manure. The organic manure will be slow, so that is the difference. (Interview #L1)*

²¹ This statement essentially defines the African philosophy of *ubuntu*, which Lupele (2007) associated with Emirbayer’s philosophy of relationalism.

Researcher: *After how many seasons or years do farmers become competent in practising the MFS?*

Facilitator: *Actually, we were saying 5 years. If you persist for 5 years, we will be sure. Our point of view, we are looking at the soil. So we are saying in 5 years time, the soil will have improved so that would be the basis. (Interview #L4)*

Contradictions between interests of subjects in the same activity system as discussed here constitute a primary contradiction.

6.5.1.3 Between the familiar seasonal patterns and the changing climate

Climate change, which has been attributed to human activities, is causing changes in rainfall and frost timing and quantities which are making it difficult for farmers to plan (see conversation below). Farmers are finding it increasingly difficult to determine when to plant rain-fed crops. Thus climate change is reducing certainty and predictability. Climate change creates shocks and risks of an environmental nature and such shocks generate contradictions in CHAT.

Facilitator: *We used to know that, particularly in the southern districts, we are going to have winter rains. And of course there will also have rain in summer. But nowadays it's difficult... You no longer know when frost will hit... it hits any time it likes. (Interview #L5)*

Farmer group: *Another problem is climate and usually in order to achieve the produce, what we do is that we plant very small patches so that we can manage them by irrigating those, so that we harvest. ... We build some dams and the other structures so that we collect the water but when the disaster of drought is there, everything is just finished. (Interview #L2)*

The statement made by MFS farmers below suggests that climate change may be encouraging some farmers to use chemical fertilizers which make crops grow faster in a situation where the growing season has shrunk:

Farmer group 1: *So with the weather that is, this kind of climate, we will be able to plant in November, which will be late for us. So if we have [chemical] fertilizer, we can also speed up the growth of the plants so that we can have a harvest. (Interview #L1)*

The problem of climate change in Lesotho has also been noted by Mohapeloa:

Lesotho exported food to the Republic of South Africa from the early 1900s until the 1960s when it became a deficit producer. Over the years, it has experienced a further decline in agricultural yield... Much of the food insecurity is caused by wide inter-annual fluctuations of production as a consequence of harsh and unpredictable weather, exacerbated by landlessness, unemployment and poverty. (Mohapeloa, 2002, pp. 12-13)

The discussion further highlights that MFS farmers are not merely interested in maximising production, but also in minimising risks and therefore in building their resilience. The tension discussed above suggests that there is a need for a risk epistemology in agriculture (see also

Sections 1.2 and 5.8, Table 5.2). Climate change triggered contradictions, which are induced by human activities, generate quaternary contradictions.

6.5.1.4 Between corporate and government tools (and interests) on one hand, and local community resilience on the other

The study revealed that there are competing interests that try to influence farmer practices. On one hand government and agro-industries that produce pesticides, seed and fertilizers promote high external input agriculture while on the other hand, development NGOs seek to build farmers' resilience and reduce their dependence on fertilizer, seed and pesticide companies and others. Robertson (1994) noted that the government of Lesotho and the corporate sector had worked hand in glove to promote farming practices that did not empower the farmers and gave this as one of the reasons for the undermining of the MFS. There were other methods used to undermine and stigmatise MFS as one facilitator pointed out.

Facilitator: Before I went to Bulgaria, there was a general impression given to us by the powers that be, yes, and the government – that the MFS was primitive. It was very primitive. „This man was sending us back to where we came from“ [both laugh]. (Interview #L6)

Facilitator: Even the seed input fairs that are running now, they would reject some of the open pollinated varieties and saying aah this one we don't know, this one we don't know. We do not support things we don't know. (Interview #L4)

The above described tension makes MFS a contested practice and contestation brings with it contradictions which can be fruitfully utilised for learning and growing the practice (see Sections 1.6.3; 1.8; 2.6 and 3.4.3).

Job opportunities in South African mines appear to have had an ambivalent impact on agriculture in Lesotho. In the first place the mining industry in South Africa provided a market for its produce, then later, attracted men from the country who sent back resources, some of which were used in agriculture but their knowledge and physical power was lost. The recent reduction in the number of men employed in the South African mines has been blamed for reduced investment in agriculture and an increase in stock theft noted by Turner (2003). The number of men in South African mines rose and fell between 1982 and 2002. For example, in 1982 Basotho men employed in SA mines were 117, 641 and reached a peak in 1989 at 126,773 before beginning the descent from 1990 onwards. In 1992 119,596 were employed and after ten years the number was about half at 61,778 (Central Bank of Lesotho, 2003 in Turner, 2003, p. 33).

Stock is stolen because there is very little else to steal in the mountain districts... It is clear that the overriding cause of stock theft is poverty. Respondents consistently rate joblessness and poverty as the primary reasons that theft has become endemic ... unemployment has

increased substantially throughout Lesotho since 1990... Not surprisingly, it is reported that stock theft increases following poor harvest... stock theft is a result of poverty, stock theft increases poverty and stock theft begets stock theft. (Kynoch & Ulicki, 1999, in Turner, 2003, p. 39)

This clash of interests between subjects in one activity system and those of another or others, that is between that of MFS farmers on one hand, and government and corporate sector on the other, is a quaternary contradiction

6.5.1.5 Between environmentally friendly methods and efficient but harmful chemicals

Farmers are sometimes faced with difficult choices in managing pests in their fields. When pest populations boom, often a sign that the pest-predator balance has been upset, they have to use „destructive“ pesticides in order to salvage something from their field. This however, often means they worsen the ecological balance in and around their fields as predators get killed too:

Facilitator: You can only use chemicals as a last resort where you see that the damages are going beyond threshold. And we are saying okay, you try integrated pest management, whereby you start with cultural methods. You prepare your land in such a way that it is clean, free of pests. You buy quality seed. Not just from anywhere, then yes those cultural methods. Thereafter, if you see some pests, you can use chemicals. You can scout through the fields and you pick, you say okay we have locusts here, we have stock borers here. But if you see the damage is going beyond the threshold, then you say let my try natural remedies. They know how to make concoctions. We have taught them how to make concoctions. You can take tobacco cigarettes. Take your smelly plants, garlic, chillies, put them altogether and then use them. But if they do not work, that is when you go to the chemicals. But you need to be knowledgeable about the chemicals. How to use it, when to use it, what are the side effects that could be brought by using them? (Interview #L4)

The contradiction described in the above interview is a quaternary one which exists between a tool producing activity system and the central activity system of the farmers in this case.

6.5.1.6 Between land and agricultural government policies and MFS practice needs

The government policy is supportive of MFS in theory but not in practice. There is no budget to support the positive policy statement and the government has no technical capacity to support the practice (see Section 5.7.5). The MFS promoting NGOs on the other hand have not done much to support government learning of MFS and have been accused of protecting the „MFS secret“. This has created a double bind situation that needs to be addressed by both parties. Interviews L5 and L6 show the disconnection between government rhetoric and its practice.

Researcher: But why is government not supportive of this?

Facilitator: You know the government, I would say, at policy level, they recognise MFS, and they recognise Permaculture. Conservation farming is the cream, the priority but the people who are supposed to implement these things are not convinced that this is the way to go

because their training is on conventional agriculture. So implementing those policies is a challenge because I can say even if they would like to do it, they are not ready. ... There is still a programme within the Ministry which is promoting MFS but for the five years it has been implemented, there is no single plot of MFS.

Researcher: This block farming system which they are supporting and promoting now, how is it going to affect conservation agriculture?

Facilitator: It's not. That is one question that we are struggling with to explain... They want to put 100,000 hectares under block farming. And there is a budget for that. And then they want to put 100 hectares on conservation agriculture.

Researcher: [laughs] One hundred only?

Facilitator: Yes and then we were asking, which block is going to contain this 100 and then you find that it is not there. They think that there will be a piece somewhere [both laugh], which has conservation agriculture. ... I think conservation farming and MFS is suffering the same fate because, especially when you look at the technology being used, the hand hoe under MFS ... animal draught under MFS... the ministry is much more interested to invest in tractors. (Interview #L5)

Researcher: And from the government's point of view, how much investment and support does the government give?

Facilitator: No, absolutely none. But support, especially now, this building is government [referring to his office building].

Researcher: Okay, that's good.

Facilitator: Yes it given. We are fortunate in that the government has finally also accepted that the system is good for the people. So we are now working together in fighting, alleviating poverty in the country. We were allowed by the Ministry of Agriculture to teach the MFS. (Interview #L6)

The seed discussion below illustrates how some government policies have tended to undermine the self-reliance that MFS seeks to build among farmers and that promotion of MFS by government will mean reviewing not only the extension system but also policies that have a bearing on agriculture.

Researcher: Any other difficulties?

Facilitator: I think it is to do with the seeds.

Researcher: Seeds?

Facilitator: Yes, seed networking in the country has really collapsed so even if farmers have money, sometimes they cannot access seed. Seeds are not available. It's worse with potatoes.

Researcher: Do you not encourage them to produce their own seed?

Facilitator: It's only like, we have a programme which is doing seed multiplication. But it has not yet developed well because we have met some challenges and the challenges are to do with inspection of such seeds to declare them as quality seed. And because of conventional agriculture people are being told which seed to buy. So if it is not treated and packaged well, then they are not able to sell even when there is this government programme where they are buying seed. (Interview #L5)

Current land tenure policies are also militating against the spread of MFS and create contradictions for farmers who want to practice it but have short-term or uncertain lease arrangements as the facilitator cited below suggests:

Facilitator: *You would hire land today and tomorrow someone would like the land back. So it would be difficult. Once he sees that you are getting something out of the land, he will say aah, I am going to use my land now. So you will be forced to move to another land, so in that disturbs the craft. (Interview #L4)*

Turner (2003, p. 24) pointed out that as far back as 1980 12 % of the Mafeteng district households were landless and that on average each household farmed 2.3 hectares but this had fallen to 0.48 hectares in 2000. Sechaba Consultants (2000) noted that 33 % of land holders in 1999 were women, most of them widows who inherited land from their husbands. The same report noted that the number of households that owned cattle was 54.6 % in 1999, down from about 80 % in 1989. There has been a gradual increase in the area allocated for growing maize compared to that for other grains that are drought resistant.

6.5.1.7 Summary of contradictions

The MFS farmers' activity system contradictions are depicted in Figure 6.7 that follows and show that there are contradictions within elements and between elements of the activity systems, as well as between the activity system and that of the neighbouring activity systems. The policies of government which have a bearing on the farmer activity system can be seen as producing quaternary contradictions.

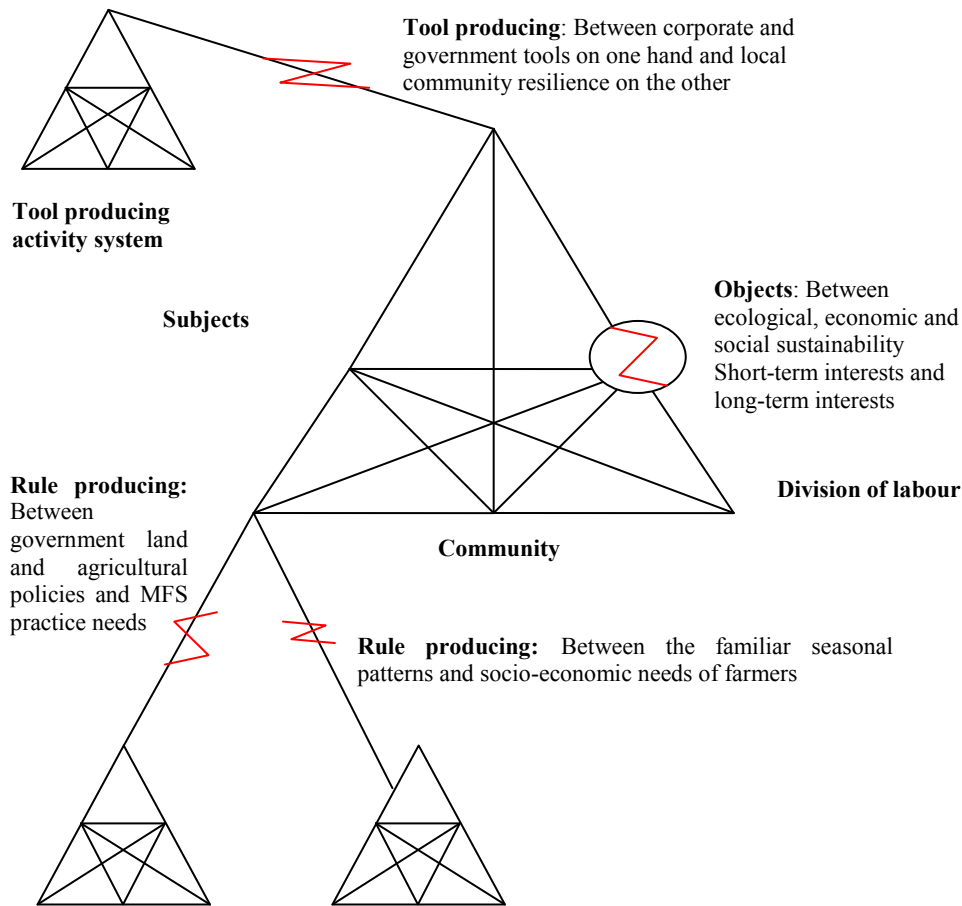


Figure 6.7: Contradictions in the MFS farmer activity system

The one primary contradiction discussed in this case study is the dialectical nature of the object of MFS in which farmers seek to achieve social, ecological and economic outcomes; short-term interests and long-term interests. The rest are quaternary contradictions between:

- Government land and agricultural policies and the needs of farmers;
- Climate change and socio-economic needs of farmers; and
- Tools produced and promoted by government and corporate sector and the MFS farmer needs.

6.4.2 Contradictions in the MFS facilitators' activity system

The study worked with MFS facilitators from two NGOs, one which was primarily tasked with the promotion of MFS and other which has MFS as one the practices that it supports promoting self-reliance among farmers and farming communities in the country. The directors and trainers in these organisations are both referred to as facilitators or tutors in this study. In addition to these two NGOs, facilitators from another NGO were also interviewed in one group interview soon after the CL workshop. Altogether, seven MFS facilitators took part in the study (see Section 4.6, Table 4.6). Two contradictions are discussed below.

6.4.2.1 Between the use value and the exchange value of MFS

The use value of MFS can be said to reside in what it can help its users do. There is strong evidence in the case study to show that it enables farmers to produce a significantly more from the same piece of land. For example, Robertson (1994) reported that a comparison between conventional farming and MFS conducted by the government showed superior yields for MFS. But the exchange value is undermined in two senses. One is that the ecological value is not factored into the prices when produce is sold. The other is that it cannot be effectively marketed to other potential users because there isn't enough information to explain why it works. Part of the problem has been that there has been relatively little research and documentation and another part is the strong practical how-to orientation.

Facilitator: The limitation is what I talked about – that it's not documented. That is the major limitation. And it's not documented because nobody is like, working on the research part of the MFS because if we were researching, then there will be documents to that effect. So that is what I see as limitations... That is why it is not very easy to convince even the policy makers – because we have not researched enough. (Interview #L5)

The lack of scientific explanation for the success of MFS has resulted in academics and technical people dismissing it on one hand while some farmers have adopted and worked with it for decades on the other. It has also created curiosity among a few academics that have begun engaging with it in a constructive way which is likely to generate the necessary explanatory power, as one interviewee pointed out:

Facilitator: Now one day we had a meeting with our colleagues at the National University of Lesotho – because we were affiliated, the agricultural college is affiliated to the university. And we had a general meeting about how agriculture is being taught. Now some of my students were in that meeting. And they asked, „why is it that we do not practise the MFS?“ There is a colleague of mine who is a professor – he jumped. He was chairman of the meeting. He jumped and said, „Look, we have not come here to play. We have come to discuss serious matters about agriculture“ [both laugh]. „After all, do you have evidence to show that this thing you are talking about works?“ ... I also worked at the institute of research, from the Lesotho agricultural college I was transferred to the Director of Research – Department of Research ... But even there I was rebuffed by fellow researchers.

Researcher: How have you tried to resolve that? How are you responding?

Facilitator: Fortunately, the system really works. It defends itself, provided you practise it properly. People keep on talking about it, even Radio Lesotho, although the Ministry of Agriculture was against it. (Interview #L6)

The emphasis on letting results speak for themselves is also well captured in a conversation with the MFS founder himself who emphasized getting results and not necessarily explanations: “With the Machobane approach, the system is a true-to-heart system. The people see for themselves, they do things practically, not reading from books” (Machobane & Berold, 2003, p. 94).

6.4.2.2 Between the need to obtain government buy-in of MFS and government interest and capacity

MFS facilitators realise that in order for substantially more farmers to be reached, there is need for the government extension system to embrace and promote the practice. However, there are two challenges that work against this ideal situation. One is that the government agriculture system looks down upon MFS and the other is that the MFS promoting organisations are seen as suspicious about government intentions or seem to protect knowledge about the practice. The first is a lack of attitudinal capacity on the part of government and the second on the part of MFS facilitators. This creates a double bind situation. The two interviews below highlight this tension:

Facilitator: But the people who are supposed to implement these things are not convinced that this is the way to go because their training is on conventional agriculture ... because I can say even if they would like to do it, they are not ready... they don't have exposure ... they don't know what is there. (Interview #L4)

The perception that MFS „secrets of success“ have been kept a secret and can therefore not be learnt are captured in the interview below:

Facilitator SL: MFS has been kept as a „holy secret thing“ to prevent outsiders from knowing how it works, a sacred thing reserved for the few. The founder and his immediate followers were not keen to have scientific investigations into how and why the system was performing. For example, I was discouraged from taking soil samples from fields in which the MFS was happening... Machobane's distrust of the Ministry of Agriculture officials' capacity to deliver on the MFS was graphically illustrated in 1997 when the SADMA programme was launched and instead of letting the ministry officers do the job, it was outsourced. (Interview #L7)

While the perception that the „secrets“ are kept hidden may prevail, there is good reason to believe that this perception is misplaced because one of the internal weaknesses of the system as discussed in the first contradiction under the MFS facilitator activity system is the logic of „it works because it works“. Explanatory principles have not been sought. Even the quote below alludes to the „how“ and not the „why“ of MFS and concludes by suggesting that it is the attitude of the authorities that needs to change. The other attitude that has been described as problematic is that farming is seen as a domestic and female chore rather than a profession, and men's ambitions are outside the agricultural sector (Boehm, 2002).

Farmer group 2: We should try to train the authorities, these people. But how do we do that training? It's a problem you know because they overlook it. They know about it, they have heard about it, they have seen it, people doing it, but they tend to overlook it. (Interview #L2)

The use value and exchange value contradiction discussed here can be seen as a tension between the tool of the practice and its object – what makes it work as the tool and the object of making it get adopted and obtain true value.

6.4.2.3 Summary of contradictions

The two MFS facilitators’ related contradictions are depicted in Figure 6.8 below.

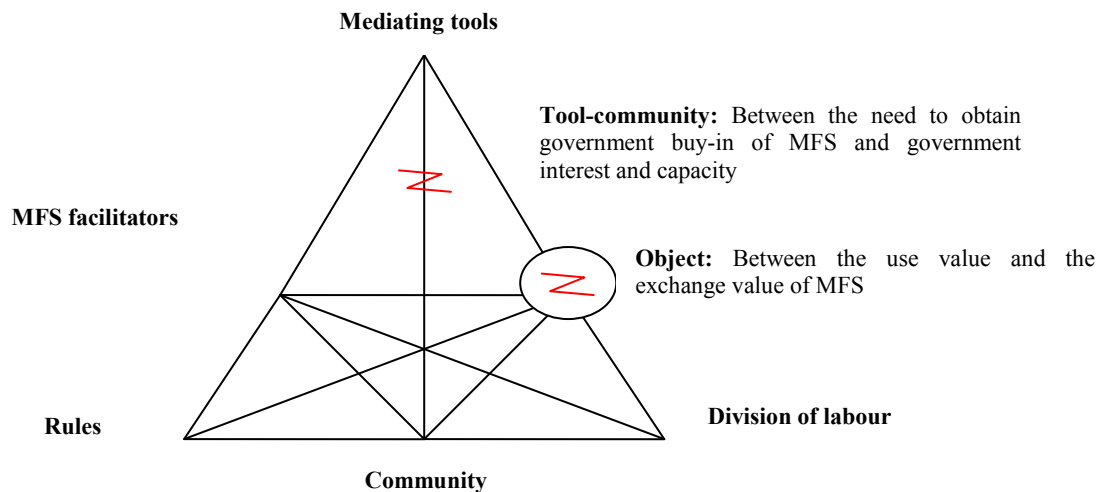


Figure 6.8: Contradictions in the MFS facilitator activity system

6.4.3 Contradictions in the government extension workers’ activity system

Only one contradiction is discussed here.

6.4.3.1 Between taught curriculum and farming realities

Three important issues that have been raised concerning agricultural extension by government in Lesotho is that there was no effort to make full use of the growing season; there was always high risk of failure should the season be difficult due to drought, too much rain, early or late frost, pest and disease attacks; and crop rotation was not practised as often as it should be (Mosenene, 2000; Grandin, 2001; RSDA, n.d.). This suggests that extension messages are ill-adapted to the ecological environment in which they operate. O’Farrell et al. (2009, p. 38) noted “drought highlights social and biophysical connectivity, and coping with and adapting to drought requires acknowledgement and engagement with both processes.” This is a secondary contradiction between the mediating tool (methods of farming) and the object of enabling farmers to produce enough food in their agro-ecological environments. However, when this contradiction is seen in relation to the farmers’ activity system, it becomes a quaternary contradiction from the point of view of farmers who receive inappropriate messages. Figure 6.9 that follows depicts the contradiction as a secondary one.

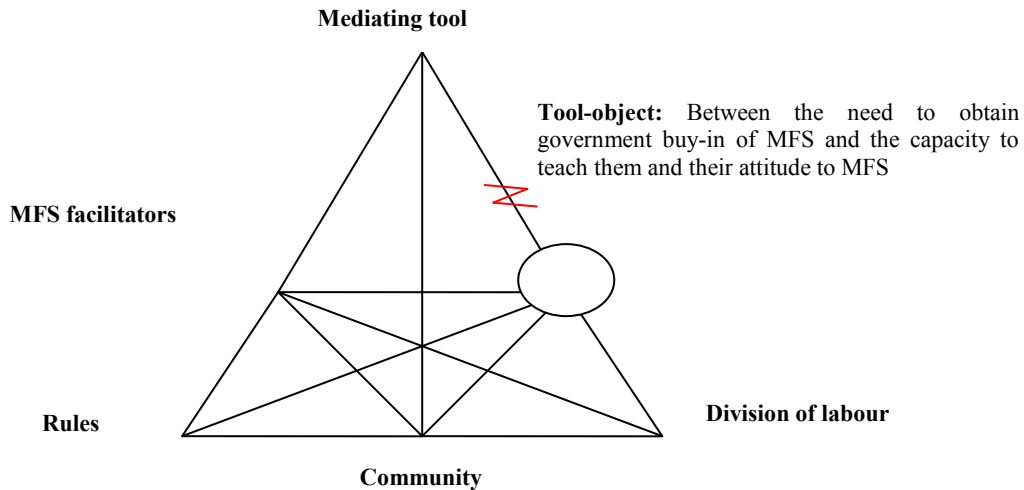


Figure 6.9: Contradiction in the government extension workers' activity system

6.4.4 Summary of the MFS case study contradictions

Table 6.3 below summarises the contradictions discussed in Case Study 3.

Table 6.3: Summary of contradictions in the MFS case study

	MFS farmers	MFS facilitators	Agricultural extension workers
Primary contradictions	<ul style="list-style-type: none"> • Between environmentally sensitive methods and efficient but damaging agro-chemicals • Between short-term and long-term interests • Between ecological, economic and social sustainability outcomes 		
Secondary contradictions		<ul style="list-style-type: none"> • Between the use value and exchange value of MFS • Between the need to obtain government buy-in of MFS and government interest and capacity 	<ul style="list-style-type: none"> • Between taught curriculum and farming realities
Quaternary contradictions	<ul style="list-style-type: none"> • Between corporate and government tools (and interests) on one hand and local community resilience on the other • Between government policies and MFS practice needs • Between the familiar seasonal patterns and the changing climate 		

The contradictions identified in the MFS case study show that there are contradictions between agricultural policies and the needs of the people whom they are meant to serve. And this can be traced to the history of agricultural development during the colonial period and the need for mine labour in South Africa which created „widows“ with living husbands (Mosenene, 1999). However, the men in the mines continued to exercise decision-making over what to farm (Moeketsi, 1990) because of skewed traditional power relations between men and women. The agro-ecological affordances are in tension with the agricultural production strategies which are promoted by mainstream extension systems. For example, Moeketsi noted:

The growing season in the mountains is short. This, coupled with heavy and early frost poses a disadvantage as far as crop production is concerned. The unfavourable growing season and hostile weather team up with low productivity in the mountainous parts of the country to expose households living in the mountain district of Lesotho to higher risks of food insecurity (1990, p. 24).

The other clashes are associated with a contradiction between two knowledge systems, with MFS being firmly located in the local, practical and tacit while mainstream education policy is located in the formal, explicit and scientific knowledge. For farmers, there are primary tensions on the object which are concerned with short-term interests and long-term interests as well as with addressing economic, social and ecological outcomes.

6.6 CAUSAL MECHANISMS INFLUENCING CONTRADICTIONS

Discussions in this chapter suggest that there are some commonly found contradictions across cases, encountered by research participants in their different agro-ecological and socio-economic contexts. The contradictions that are commonly found in the case studies are:

- Primary: the contested nature of the object; and the clash between long-term and short-term needs.
- Secondary: Mediating tools for learning and practising agriculture versus the object of learning and practising it.
- Quaternary: ambivalent messages from within and without sustainable agriculture activity systems; expedient high external input tools versus ecologically sound principles; ecological affordances versus human needs and wants.

This means that the practices may be facing similar challenges but more importantly that addressing one practice could provide useful clues to solve contradictions in the other. Many of these contradictions are quaternary meaning that they arise from broader contextual factors. This informs my argument for developing tools that can be used across the cases and from a broad system view of the activity systems that have been studied and beyond (see Section 9.4).

Using retroductive analysis from critical realism this section seeks out causal mechanisms to establish what *may* be causing the contradictions within and across activity systems. Drawing on the history of sustainable agriculture, the study found that agro-business interests and those of ordinary farmers often pull in opposite directions (see Sections 2.3 and 5.3). This history therefore provides an explanatory principle (see Section 3.6.10). In particular the stigmatisation of all forms of sustainable agriculture can be viewed as an indicator of the contested nature of the practices under discussion. The stigmatisation in South Africa and Lesotho can be traced back to colonial and apartheid era tactics to discredit agriculture so as to create labour reserves for gold and diamond mines (see Sections 2.3, Box 2.1 and 5.7.1.2). Baker (1986, pp. 80-81) made a noteworthy and related explanation which has a bearing on all three case studies:

Another serious weakness of the educational policy of the colonial era, not unconnected to the previous one, was that there were two separate education systems – one for blacks and one for whites. This had the effect of making the blacks covet intellectual excellence as the only ultimate goal ... To be „educated“ was to achieve a position *where one did not soil one's hands*... Had such a separation between the two systems not existed, perhaps this distorted concept of the true nature of education may not have been so powerful ... So powerful was the myth to take hold that, as with the other educational problems left to newly independent nations, it is proving, indeed, extremely difficult to eradicate. [my emphasis]

A commonly found contradiction is that of climate change and the socio-economic needs of the farming communities in the cases under review. Boehm (2002) drawing on Mehta et al. noted that farmers have to navigate along three kinds of uncertainties:

First, livelihood uncertainty, which describes the vagaries of international labour and capital markets. Second, ecological uncertainty, which stress that ecological systems are influenced by variation and disequilibrium. Third, knowledge uncertainty, indicating that knowledge is always situated, contested, plural and partial. (Boehm, 2002, p. 3)

J. Worth (2009) provided a useful explanation concerning ecological uncertainty which touches on the other forms of uncertainty in her deliberations on climate change injustices: the polluter does not pay, the poor are affected most, and the poor cannot do much about it (see Sections 1.7.4.2). The explanation appears to reside in the power gradients that exist between the rich and the poor consolidated in developed and developing countries. This is the current burning issue as world leaders deliberate climate change and what different actors can do about it, evidenced in the Copenhagen talks (Annan, 2009). The risks ultimately affect everyone and invite cooperation and responsible action across the globe. Annan, former UN Secretary General further noted that for the climate change deliberations in Copenhagen to become successful, “climate change justice must be at the heart of the agreement. An unfair deal will come unstuck.” (2009, p. 21)

In South Africa the education system diminished the status of agriculture as one respondent noted:

One of the largest stumbling blocks I have come across in working with trying to train people in small-scale agricultural development is the negative effect of the education system of apartheid years where if you were clever you went to a normal school, and if you weren't so clever but were good with hands you went to a technical school and if you weren't good with your mind or hands, you went to agriculture. (Interview #SA2)

The general nature and of the education system in Zimbabwe also reflects a strong academic orientation but has not had a similar effect on agriculture because gold and diamonds were not as significant in the country (Murwira et al., 2000). The second and related explanatory principle is associated with power relations that exist between different actors. Government has the political power to decide on policies, the corporate sector has the economic and cultural power to push high external input agriculture. They hire the bright and learned in the community. Universities and colleges have modern and institutional forms of intellectual or cultural power, which has generally tended to reproduce western knowledge and agricultural practices (Shava, 2008). The economic power of government, partly derived from donor aid from pro-conventional agriculture countries, has resulted in some programmes that entice farmers by providing free or subsidised inputs (see Section 5.3.2). Within rural communities in Lesotho there are power relations between the landlords and the landless, with the latter being dependent on the former (see Sections 6.4.1.3 and 6.5.1.6). Those who rent land – often on leases that last a few years – are discouraged from building the ecology of the soil because the lease can be terminated at any time.

Women in the case studies under investigation tend to be the ones who do not have land and generally do not get as much access to agricultural education as men. In Lesotho however, it was worth noting that there all the four agricultural extension officers who attended the CL workshop were women and that most of the farmers who attended the workshop are women. In Zimbabwe no women farmers attended the workshop (although some participated in the interviews). But the better presence of women in the workshop and in agriculture in general in Lesotho masks the uneven power relations that exist here as they do in Zimbabwe and South Africa. The decisions and what to grow, and when to grow it in the fields are still made by their husbands who are miles away in South African mines (see Sections 6.4.4 and 6.5.1.6). These uneven power relations between men and women in agriculture appear to need further investigation in terms of how they affect sustainable agriculture practice learning and development. I therefore recommend studies in future to examine gender and agricultural learning and practice.

Ignorance about sustainable agriculture explains why government extension workers cannot effectively promote it. This was a common issue in all three case studies as there are limited places to learn about it and no fully accredited courses on sustainable agriculture are being offered at undergraduate levels in the agricultural training colleges and degree programmes under review. New qualifications are being developed at NQF level 5 in South Africa, but

these are poorly utilised and remain outside the mainstream. Not knowing much about sustainable agriculture also occurs in other places that matter: at government policy-making level; in higher institutes of learning; among curriculum development workers; and bureaucrats who allocate resources. The absence of sustainable agriculture in the mainstream schools and colleges, and the lack of focus on it, sustains the ignorance. On the ground, among farmers, lack of government material and financial support towards sustainable agriculture perpetuates conventional agriculture at the expense of sustainable agriculture. At the same time, skills development has been viewed from a short-term perspective rather than as a long-term process focusing on a practice (see Section 5.7.1.1). This calls for mechanisms to foster ongoing reflexivity in the education and training systems concerned.

The inclusions and exclusions in terms of what goes into the mainstream curricula also explains the structural contradiction that pits local knowledge against western, practical against theoretical, marginalised against dominant. Visvanathan (2006) argued for cognitive justice, which draws on and recognises different knowledge systems and sources. Whose knowledge matters and what knowledge matters has often been determined by those who conquer others and therefore exercise some form of power over them. This study, being located in the field of environmental education and having therefore a strong interest in knowledge generation and learning, has a special interest in cognition and what this might mean in sustainable agriculture contexts (see Sections 8.4 and 9.2.4). This will call for not only understanding and reflexivity but also for agency to be exercised. There is evidence to suggest that local agricultural practices were producing surplus food when colonialism and related processes disrupted the local learning and development trajectories. Robertson (1994, p. 120) noted that:

The Sotho reputation for agricultural incompetence is a latter-day slander. The question, as Murray insists, is not why the Basotho are „still“ poor, but how they *become* poor. In the nineteenth century, Basotho farmers like Machobane’s grandfather were without parallel in the region, supplying grain and agricultural services to the impoverished white immigrants ... In the 1950’s it was particularly difficult for those in authority to believe that the Mosotho could be an agricultural genius, far less that he could reckon to be so with the pretension of *science* [emphasis original]

Murwira et al. (2000) raised a similar point in connection with traditional agricultural knowledge in Zimbabwe.

Rodney describes how indigenous people had made advances in agriculture and mining well before the settlers had arrived. He pointed out that Zimbabwe had produced hydrologists who had diverted countless small streams for irrigation. These streams were „made to flow around hills in a manner that indicated an awareness of scientific principles governing the motion of water“... One of the misconceptions about pre-colonial agriculture in Zimbabwe is that it was subsistence; it was not. When the settlers arrived in the country, black farmers were ready to exploit the market and provided settlers with grain and livestock for food ... Subsequent

pressure from white farmers brought about deterioration in black agriculture, first by pushing for legislation which protected white farming against black competition. (p. 13)

More recently, in the organic farming sector movement tribute has been paid to local farmers who used traditional and local knowledge to build sustainable agriculture practices as pointed out by Auerbach, when he responded to a report on the Organic Farming Sector submitted to the Department of Trade and Industry:

Ignoring the pioneering contribution to organic farming of Robert Mazibuko is a major oversight, especially when the [Institute of Natural Resources] INR conferred a Special Award and illuminated scroll on Mazibuko in recognition of his contribution to conservation and organic agriculture. (2009b, p. 4)

Section 5.9.6 refers to these histories and such knowledges as „reservoir of adaptations“. They provide important mechanisms for cognitive and reflexive justice and for practising „abnormal science“ as discussed in Chapter 2.

6.7 CONCLUSION

This chapter was devoted to discussing contradictions that are being faced by different actors in the field of sustainable agriculture. It noted that some of the contradictions are within the elements of the activity system, others between elements and yet others between different and interacting activity systems. Many of the contradictions are commonly found and others are situation specific. The chapter used retroduction to explain and identify the likely causal mechanisms that result in the emergence of the structural contradictions discussed. Two main sources of explanation were identified: one is concerned with power and power relations between and among different people (historical and contemporary); the other is concerned with what the agro-ecological affordances, that is, the soils, topography and plant and animal diversity, can offer as well as how weather may enable or constrain practices. In the next chapter I report on how some of the contradictions discussed here were used as material for joint reflection, learning and action. As a way of bridging this chapter and the next, I share an analysis of one of the participants“ account of the growth of her organic business (outlined in Table 6.5 below): the contradictions encountered and how they were resolved, and how new ones emerged and were dealt with in the evolution of the business over about eight years.

Table 6.5: Evolution of an organic business in the case study

Stage	Contradiction	Solution
Working as flower shop assistant	Not enjoying the job, feeling underpaid, not being able to sponsor own yoga lessons.	Earn extra income by selling organic vegetables to women attending yoga lessons using a small car.
Organic vegetable seller	Demand for organic vegetables found beyond the yoga group; potential to earn more money noted but car too small for the necessary volumes.	Approach spouse for a bigger truck, and sister to increase investment in buying in bulk and selling together. Selling off the back of the truck.
Organic vegetable	<i>Double bind</i> reached when the law did not	Adopt a two-pronged approach: make

seller with sister as business partner	allow them to sell off the back of the truck. And yet they needed to grow the „enterprise“ as the demand was there.	deliveries to households and at the same time identify farmer markets to sell organic vegetables in different parts of Durban on different days.
Business partners delivering to households and selling at five main markets and at special events	Sisters hit a snag in the summer months because there weren't enough local vegetables to meet market demands. Business needed ongoing trading so that entrepreneurs would have enough for their upkeep. Sisters did not have the money.	Approach parents for the necessary capital which they got. Import bulk produce from Europe summer and benefit from economies of scale.
Selling imported and local organic produce as team	Selling imported produce at the farmers markets presented new challenges. The imported stuff was too bulky to be sold through retailing by the two. The prices of the imported food were too high for buyers at the markets. Storage costs were also high and the open environment was not good for preserving the good looking quality of the branding. And yet the sisters had a hunch that there was potential for profitable business in this.	Sisters (business partners) register as a company and look for proper premises from which to sell produce in a location where appropriate buyers could be found. They seek professional input in business development, divide the business into two: a wholesale business which would ensure the fast movement of imported stuff and the retail department to sell local and imported organic produce to consumers. Establish a professional accounting system supported by the necessary software and hardware.
Operating as a registered business	The site of the business was not appropriate yet; the potential of the venture seemed high. The function of retailing still needed to be supported by regular contact with suppliers in and around Durban to ensure the right quantities and quality of vegetables.	Ownership as shareholding in the business. Look for a more appropriate and spacious business site in Durban. Add a „slow food“ dimension to business – value-addition. Hire staff to help run the retail and café. Establish website.
The venture with a wholesale, retail and restaurant	Some customers begin to ask nutrition-related questions to the retailers who are not trained in nutrition. Local organic supply volumes drop partly due to aging population of suppliers, while demand increases.	Attend course in nutrition (employee). Identify „new“ organic farmers and supply them with seed and seedlings to get them started. Arrange for a form of contract farming based on principles of fair trade and trust.
The future business	Uncertainty about contract farmers' ability to deliver on promise. To expand the business further afield or to stay put in one town? To join big established retailers or to be their competitor?	Not yet developed...

Chapter 7: Expansive Learning Processes in Three Case Studies

7.1 INTRODUCTION

The journey along the expansive learning process began in the previous chapter (Chapter 6) with the questioning and critiquing of the manner in which sustainable agriculture practices were being learnt and practised. Through that process, contradictions were surfaced. This chapter shows how some of the contradictions were identified and analysed in the second stage of the expansive learning process. It also describes the third stage in which solutions were modelled with and by research participants (see Section 3.6.5). This is achieved through an analysis of how shared goals were identified and a description of the boundary crossing that took place between activity systems in the three case studies under review. The main method employed at this stage of the research process was CL workshops (see Section 4.3.4).

CL workshops were employed to help research participants analyse contradictions and model solutions which were implemented after the first round of CL workshops and reported on during feedback workshops. The feedback workshops took place between three and six months after the modelling of solutions. Change Laboratory (CL) workshops were used to analyse selected contradictions, model solutions to them and initiate a solution examination and implementation process along the expansive learning cycle. This was the intervention phase of the study. The Change Laboratory method was developed along the lines of double stimulation. The first stimulus is „mirror“ data which is gathered from participants and their contexts and presented to them in ways that stimulate reflexivity. The second stimulus is a conceptual model, which is commonly but not exclusively an activity system (Engeström, 2007). These formative interventions in the Vygotskian sense need to be understood as formation of critical design agency among all parties: researchers, teachers and students “what is initially presented as the problem or the task is interpreted and turned into a meaningful challenge several times over in the process of the intervention” (Engeström, 2007, p. 370). The CL workshop develops work practices where participants dialogue and debate among themselves, with management and clients and with the interventionist researchers and are a place where „disturbances“ of daily work processes are materials for analysis and interpretation as well as seeds for defining the zone of proximal development of the activity (Ala-Laurinaho & Koli 2007, p. 26). Below is a table that shows details of the six sessions of the CL workshop conducted in the three case studies (see Section 4.3.4, Table 4.3):

- Session 1: Orientation to the workshop and tools and doing a historical timeline of the practice and individuals in practice;

- Session 2: Identification of contradictions by participants and presentation of mirror data (contradictions) by researcher;
- Session 3: Analysing contradictions and developing solutions in groups;
- Session 4: Sharing and critiquing solutions in plenary;
- Session 5: Planning the way forward; and
- Session 6: Feedback on implementing solutions.

The learning process discussed above encompasses Wals' (2007) notions of deframing and reframing (see Sections 4.3.4 and 4.8.5) and the views of Wals et al. (2009) who proposed a stepwise process to social learning which resonates with expansive learning (see Section 2.6). In a nutshell, this chapter tells us about how farmer learning was expanded and is therefore central to the research topic and main question (see Section 1.5). Finally it is important to point out that Engeström's version of third generation activity systems (see Figure 3.4) provided a useful guide to carry out boundary crossing CL workshops, which were the focus of the expansive learning process (see Table 4.4). It was also important to note that experiences of research participants showed how they sometimes learnt expansively but without being so aware of it and therefore not deliberately and repeatedly following expansive learning as illustrated in Table 6.5.

7.2 THE SCOPE CASE STUDY

7.2.1 Change Laboratory workshop participants and process

Participants in the SCOPE CL workshop were Permaculture facilitators in the school, Permaculture pupils and farmers, and a government agricultural extension worker from the community (Table 7.1). By bringing these three groups of people together, I wanted to ensure that each important subject group in the activity system „had a voice on the table“ (Hill et al., 2007, p. 366). In addition we had an agricultural extension officer from the area who usually provides technical input in the system although he comes from a different activity system and a former Permaculture facilitator in the school who had joined a NGO operating in the area and promoting sustainable agriculture and natural resources management. The mix (Figure 7.1) had the potential for boundary-crossing. In February 2009, a five-session, four-day CL workshop was run and in September 2009 a feedback workshop was held.



Figure 7.1: (left) Researcher presents activity system and expansive learning concepts; (right) participants maintain group sitting arrangements during the plenary session

7.2.2 Identifying a shared object

Based on data generated as reported in Chapter 5 (on motivation for practising sustainable agriculture), a shared object between farmers in the community and Permaculture facilitators in the school was developed and is depicted in the figure below. The shared object of the two activity systems was food production, income generation and ecological well-being of the area (Figure 7.2). After identifying this shared object, research participants sought ways to address some of the tensions that they had already identified in a way that allowed them to move towards the shared object.

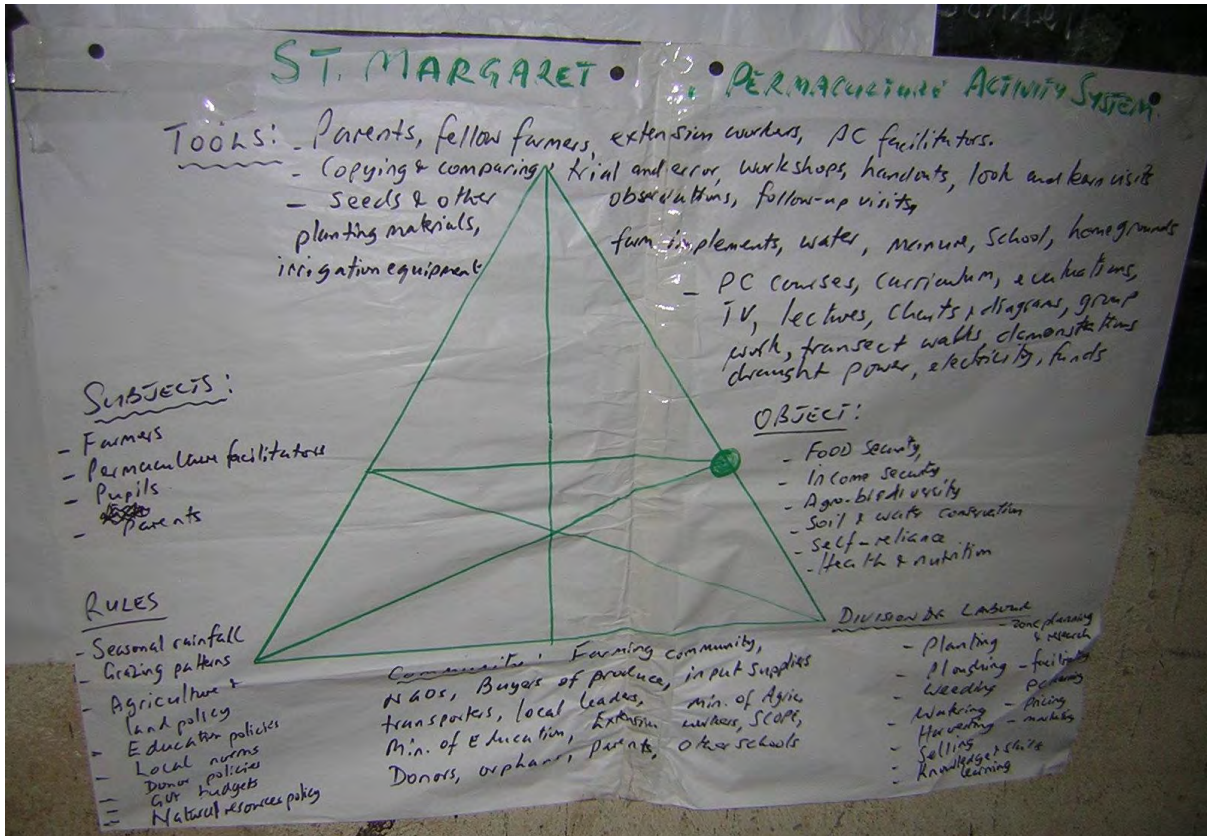


Figure 7.2²²: Showing the shared object of farmers, Permaculture facilitators, pupils and parents as presented during the workshop

7.2.3 Analysis of contradictions

Research participants selected a number of problematic issues in the activity systems of the school, and that of the farmers and analysed them before proposing model solutions and planning the way forward along the expansive learning cycle. In this sub-section however, the chapter concentrates on two sets of related tensions and aims to explore how they were addressed: the tension between means of production (water) and object of production in the school – food and income, which can also be understood as education with production and sustainability; and the tension between farmers’ production of surplus food and access to markets because both had a direct bearing on the shared object of the two interacting activity systems (see Sections 5.2.1 to 5.2.3).

²² This figure conflated the school activity system and that of farmers in the community but served well in terms of showing the shared objects. The elision was subsequently corrected.

Table 7.1 Contradiction analysis in SCOPE activity systems

Problem	Causes		Trends/History	Size/Scale
Between means of production (water) and purpose of production (food and income)	<ul style="list-style-type: none"> •Electricity cuts •Droughts •Seasonal rainfall 	<ul style="list-style-type: none"> • Poor yields • Loss of income 	<ul style="list-style-type: none"> • 1994-2000: school was not in control of diesel engine; • 2000-2007: electric engine, school in control; • 2008 to date : (a) national strikes (b) destruction of electricity wires 	<ul style="list-style-type: none"> • Poor distribution of water to the school • Yields improved. This period invited international visitors • No yields at all
Between surplus production by Permaculture farmers and poor access to farmers (transport and marketing)	<ul style="list-style-type: none"> •Poor roads •Fuel prices •Lucrative businesses poor • Expensive transport 	<ul style="list-style-type: none"> • Perishables decay • Buy expensive things • No local markets • Selling produce at a loss 	<ul style="list-style-type: none"> • 1994-2001: transport was good; • 2002-2004: service was declining; • 2005 to date: serious transport problems 	<ul style="list-style-type: none"> • Efficient • Slightly efficient • Inefficient

The contradictions above were slightly reconceptualised in view of the shared object by the different actors but also in view of new and emerging developments. The production in the school garden had continued to fall while among the farmers, production had continued to rise but the nearby community which is made mostly of farmers was not buying enough of their produce. Essentially both contradictions are concerned with supply and demand forces pulling in different directions. A critical realist reading of the contradictions suggests that the structures that have power to make decisions (see Section 6.6) about when to mend roads or to repair damaged electricity cables were not performing their duty and agency was needed to transform the situation. Engeström (2008) has highlighted that the point of interventionist workshops is to build the agency of research participants.

7.2.4 Solution modelling

After conducting an analysis of the problematic situations, the next stage was to analyse them, with a view to developing solutions. Contradiction analysis belongs to the second layer in the causality table (see Section 1.6.3, Table 1.1) and to the second stage of the expansive learning cycle (see Section 4.8.5). Solution modelling marks the beginning of the Engeström's agentic layer (see Section 1.6.3) and is the third stage of the expansive learning cycle (see Section 3.6.5, Figure 3.6). The analysis and the model solutions are captured in the two letters that research participants developed in relation to their shared object and the production and marketing related tensions that they were facing. In order to draft the letters, participants conducted an analysis of the problematic situations which they had ranked. The analysis involved looking at the history of the issue, its causes and effects. Research

participants then broke into two mixed groups where they outlined solutions before tasking some members of the group to design letters, which were read out in the respective groups for improvement before sharing in the plenary. The letters that were shared in the plenary, which are of interest to this thesis are indicated below.

7.2.4.1 Letters to responsible authorities

The task to which the research participants were responding was:

Write a letter to the responsible authority outlining the problem²³ that you are facing, its causes, effects and trends. Conclude the letter by making concrete and specific recommendations as agreed by the group. As far as possible, indicate who should do what, when. Be as realistic as possible.

a. Letter to address agriculture production problems in the school (excerpts of solutions)

To: The Headmaster, St Margaret Primary School

RE: Water problem at St Margaret Primary School.

Dear Sir/Madam

This letter serves to enlighten you about the level of water problem at this institution. We will include the problems, cause, effects and trends in this write-up. At the end I will try to make recommendations for this problem.

The real water problem came when there was an electric breakdown along the line which leads to our school.. Remember teachers will be motivated to work where there are enough resources. Hence with this shortage of water, your school might end up with less qualified personnel..

After all Permaculture activities were generating income for the school. Because of this situation, the school is no longer benefiting from the project. As a means of trying to alleviate this problem, we have decided to write this list of recommendation for you to consider:

Recommendations

We thought you could start by educating the community about the importance of water and its sources. The community should also respect electric wires as they provide a service to the community. Another important recommendation is that you should provide alternative ways of providing water for the school such as drilling boreholes, use of windmills which uses wind instead of electricity. If funds permit, you should think of buying a diesel engine or a solar powered engine. Generators also can substitute electricity problem.

If you and your committee still insist on Zimbabwe Electricity Supply Authority (ZESA) power, you should try to form a committee, which should have to communicate with ZESA to find out what stops them from coming to make the repairs. Once the committee gets communication from ZESA, it will sit down with the local community to arrange for

²³ I used the word 'problem' and not tension or contradiction because it was a more familiar term among participants, and conveyed a similar meaning. See also Section 3.4.2.3.

what the ZESA people want. If it is possible for ZESA, then the community will have to do it.

Yours faithfully

Group B

b. Letter to address marketing problems faced by farmers (excerpts of solutions)

To: The Councillor

RE: Marketing and road network

I write to let you know the above project which is in your ward has some problems which need your attention urgently.

The problem has reached a high level of production of Permaculture produce..

Marketing: The produce is of high quality and toxic free because we discourage the use of artificial chemicals both for spraying and soil enrichment... At the same time, most of the perishables are decaying and being sold at a loss.

Road network: Since our road is not regularly serviced, the few motorists who use it are charging unmanageable fares of which we end up working for them and not for our reward. So if this situation remains, there is going to be a decline in the group's production and general development in your ward.

Hence we are requesting you to forward our plea for assistance as you sit for council meetings. As a group, we have agreed ourselves to fill in some of the bad patches in the roads which have been caused by erosion. This is a temporary solution. We ask you to put a proposal for a tarred road in your agenda. Once our proposal meets a positive response, we believe there will be great change in the group, community and the ward at large.

Yours sincerely

Group A (Group Secretary)

7.2.4.2 Formation of committee to spearhead implementation of solutions

Research participants decided that for their solution to be implemented, they needed a structure to carry this forward and they formed a committee during the fifth session of the CL workshop. Its task was to polish the draft letters and present them to the responsible authorities for action. The committee further committed itself to recruiting more members from the community in order to strengthen its capacity. The formation of the committee was therefore part of the third stage of the expansive learning cycle and part of the agentive layer of the causality table (see Table 1.1). The actual taking of the letters to other groups in the community, which happened outside the CL workshop, was the fourth stage of the expansive learning cycle.

Table 7.2: St Margaret plan for taking expansive learning forward

Activity	By whom	When
1. Select a committee to spearhead finalisation and implementation of solutions	Workshop participants	05/03/2009 <i>(This was done during the workshop)</i>
2. Make further improvements to the letters (examining solutions)	Committee	10/03/2009
3. Identify and recruit other people, including the influential, to join the group (of solution seekers)	Committee	To be decided on
4. Identify and meet appropriate decision makers with clear recommendations to selected problem	Group and committee	To be decided on

7.2.5 Solution examination, implementation and reviews

Seven months after the development of the solution, I met with research participants to provide and get feedback on progress. In the meetings, which constituted the fifth session of CL workshops, it was clear that the research participants had proceeded along the expansive learning cycle and were considering another intervention in anticipation of new contradictions. About a week after the fourth session of the CL workshop the committee met the relevant authorities and communicated proposals from the workshop. The local councillor supported the idea and encouraged the community to contribute. A headmaster from the neighbouring school also joined the initiative. A decision was also made to approach ZESA as not only the school but also the surrounding community needed electricity for domestic, industrial and commercial purposes. The marketing and income generation solution was adjusted and the committee approached local bus companies and negotiated fair prices.

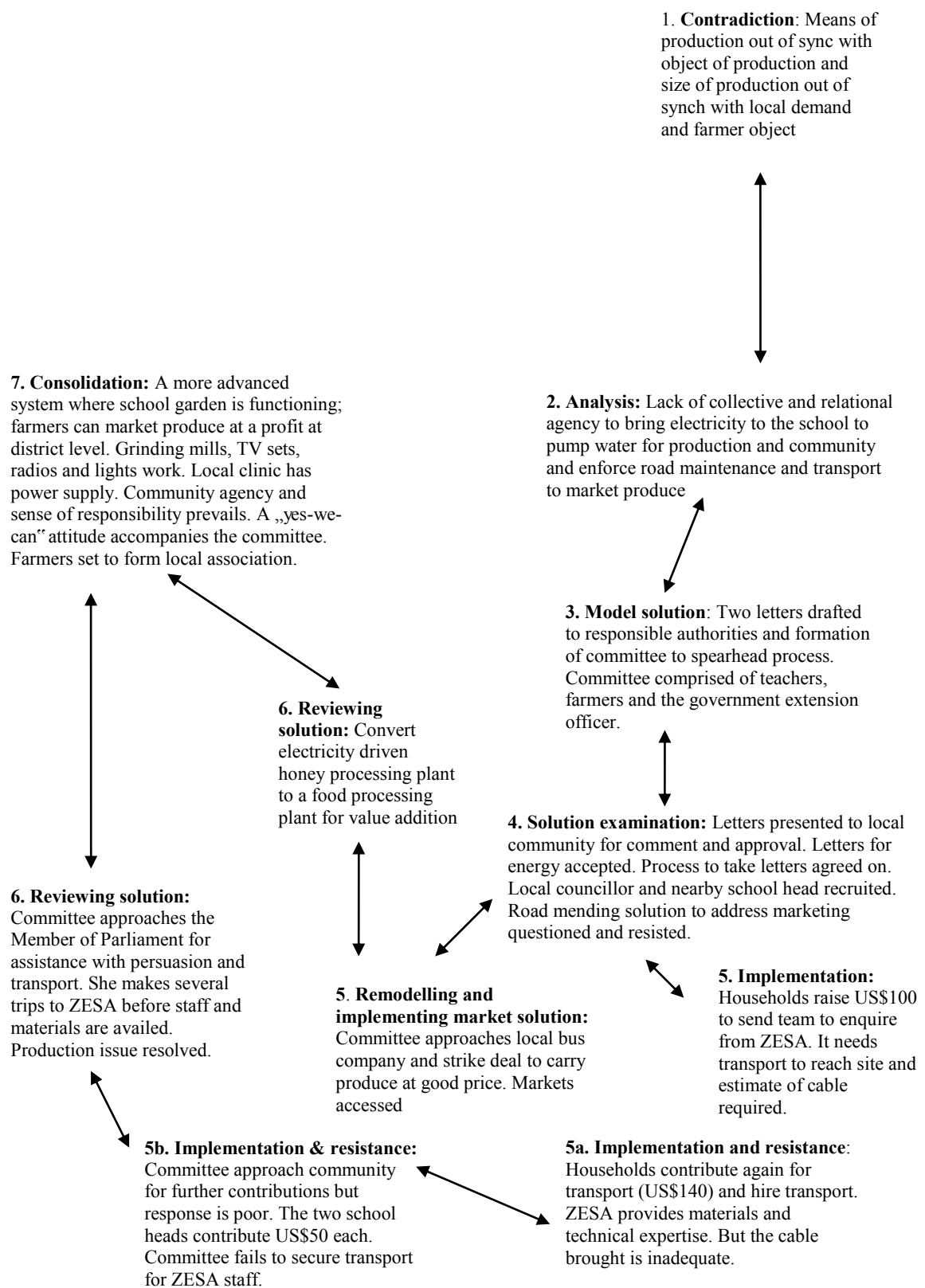


Figure 7.3: Expansive learning process in the SCOPE case study

This was made more feasible because two bus companies began operating in the area (not at the request of the committee) and operated more frequently. This reduced monopoly. The farmers, who were working with an environmental NGO promoting honey, were in the process of completing the setting up of a plant to process honey for marketing. This made the need for electricity even more compelling. But more importantly, the farmers realised that they could also use the same honey processing facility for processing their agricultural produce to add value as well as to reduce loss of produce through perishing. The plant is yet to be completed but the NGO has agreed to the farmers' idea. The farmers further decided to form a farmer association that has a „voice“ and legal persona, capable of obtaining such facilities as loans. The resolving of the energy problem was done in several stages partly because some resistance was encountered along the way. ZESA had the expertise and the materials but no transport to get to the site (about 100 km away) and money was raised three times to support trips to meet them and bring them to the area to solve the problem. Firstly, each household contributed US\$6 in a space of less than a month before the two neighbouring schools contributed a second time. The figure above (Figure 7.3) summarises the entire solution development and implementation process in the SCOPE case study.

7.2.6 Analysis of the expansive learning process

Figure 7.3 above summarises the expansive learning process that happened in the farmer and school activity systems, which culminated in improved real life situations – or change oriented learning and sustainability practices. They drew on the distributed knowledge and power that was available in their activity systems. Their actions were creative and transformative. The germ cell of the process appears to be two layered: the formation of a (developmental) committee to work on the transformation of the situation; and the drafting of concrete proposals as to what could be done to address production and marketing limitations in the face of the need for food in the school system and the lack of water to produce it; the excess production among Permaculture facilitators and the high cost of transport to market the produce. This involved identifying and articulating contradictions, deliberation and reflection, and „agentive talk“ (i.e. articulating intentions to act, and showing how prior experience can be mobilised into feasible practices) (See Section 8.2). A number of obstacles were encountered along the way which made the path to a more advanced system non-linear. The process of addressing the issue appears to have increased the capabilities of the members of the community in terms of negotiating, making connections with those with political and cultural capital as well as for mobilising resources from the community. The other capability which appears to have been built is attitudinal which generated a „yes-we-can“ mentality, despite substantive contextual complexities (e.g. high costs etc.). In short the research process increased the group's individual, relational and collective agency.

The two main interventions that were planned were the seeking of a windmill to provide renewable energy in the school system and reduce reliance on external energy sources. What this process also illustrates is that solutions to environmental and economic problems may lie outside the economic and ecological spheres and could be found in the socio-political sphere.

7.2.7 Conclusion on the expansive learning process in SCOPE

The expansive learning process in SCOPE shows how empirical research by interviewing several actors in the SCOPE activity system revealed the understanding and logic of farmers and Permaculture facilitators in learning and practice of Permaculture. In the process of gathering evidence, the research was able to surface contradictions beneath the problems that were highlighted by research participants through looking at their collective activities – as farmers in the school community and as a school practising Permaculture – illuminating contradictions in two interacting activity systems in one case study. The study also shows how letters were used as tools in taking concrete actions that not only marshalled the contributions of the headmaster and the councillor to whom the letters were addressed but also resulted in the recruiting of more members of the community, including a nearby school and the local Member of Parliament. Households in the community contributed money that was invested in addressing the contradiction. The action of addressing the need for production in the school and the lack of tools to produce resulted from the mobilisation of individual, relational and collective agency (see Section 3.6.6). During the process of implementing the solutions, a series of problems were encountered and research participants, together with other members of the community demonstrated reflexivity (see Section 1.6.1).

The case study suggests that the expansive learning process can be an effective tool for researching change-oriented learning and sustainability practice where the intention is to stimulate responsible action and set change in motion. From a critical realism perspective, the research participants exercised their agency by engaging with structures and systems of local governance (councillors and headmasters), the district political head (Member of Parliament), ZESA (quasi-government), the NGO which constructed the honey processing plant (civil society) and the corporate sector (bus company). The agency, which lay „dormant“ in them, was activated through engagement in CL workshop (event). This culminated in the emergence of new solutions generated between the research participants and the local institutions, some of which had already transformed the context in which the participants lived and worked, demonstrating morphogenesis.

7.3 WORKING WITH THE EXPANSIVE LEARNING PROCESS: THE MFS CASE STUDY

7.3.1 Introduction

The change laboratory workshop in Lesotho took place in March 2009, about 7 months after the first round of data collection. It was attended by 15 local people: 7 MFS farmers; 2 MFS facilitators (one from Machobane Agriculture Development Foundation and the other from RSDA); 4 government extension officers from the Mafeteng district in which the workshop was held. The latter two groups have hardly worked together but both work with farmers, often not with the same group of farmers. The farmers came from two districts of Lesotho: Mafeteng and Mohale's Hoek. The four extension workers came from Mafeteng district, where the first four sessions of the MFS CL workshop were held. The sessions lasted about 12 hours, with each session lasting about three hours (see Section 4.3.4, Table 4.4). The sessions were spread over two days at the request of the farmers and the hosting NGO so as not to disrupt farming activities for as long as four days. Farmers had to commute to the venue. Six hours of reflecting, exercising creativity and discussion in a day seemed to pose challenges. There were three activity systems represented in the CL workshop. This, together with mirror data collected prior to the workshop, set the stage for cross-boundary engagement. In addition there were two researchers, my colleague and I. Participants worked on five problematic situations.

7.3.2 Conducting historical time lines of two farmer groups in the workshop

Before going into discussions about contradictions, participants discussed their histories in connection with MFS, the subject under discussion. Among the different histories discussed, were those of two farmer groups, one from Mafeteng district, the other from Mohale's Hoek. Their historical analyses focused on what happened when and the significance of events. Discussing this history led to horizontal learning in the group when, for example, a farmer from one group presented an innovation which the other group did not know about and were pleased to learn about.

7.3.2.1 History of two farmer groups

The groups compiled their history on flipchart paper in the local Sesotho language and presented this in a plenary session. One of the MFS promoters did the translation into English for the benefit of the facilitator/researcher and the research assistant. The table below (Table 7.3) shows the translated version of the Thabaneng group while the second table (Table 7.4) shows the Ha-Moletsane group's work.

Table 7.3: History of Thabaneng farmer group from Mafeteng district

Dates	Events	Causes and effects
1995-1998	a. This is the time when we knew about Machobane from Ntate Machobane the founder b. People did not like it saying it is labour intensive c. The system increased yields and people from Thabaneng in Mafeteng joined Machobane farming system	<ul style="list-style-type: none"> Increased membership as there was support in terms of seeds Soils were improved with locally available resources Increased yields
2000	a. RSDA stopped providing seed assistance to farmers (this involved farmers paying back with an additional 20 % of seed loaned) b. Farmer group started to buy inputs collectively	<ul style="list-style-type: none"> Membership started to decline in great numbers Those remaining continued to implement the system We became independent because of the decline in seed support
2002	a. We improved our seed saving and buying system	<ul style="list-style-type: none"> The yields became better than before
2008	a. We managed to get legally registered with the Law office	<ul style="list-style-type: none"> Became legally recognised as a farmer group

Table 7.4: History of Ha-Moletsane farmers group from Mohale's Hoek

Dates	Events	Causes and effects
2003	a. Knowledge about Machobane farming system b. Training in Machobane system c. There was a group of interested volunteers that agreed to practise Machobane d. The volunteers named their group Ipheliseng Bataung and elected a committee e. The group drafted the by-laws to govern themselves	<ul style="list-style-type: none"> Poverty was the cause of why people got involved in MFS Lack of jobs was another cause People's knowledge about Machobane improved
2004	a. People started practising MFS	<ul style="list-style-type: none"> Yields improved
2005	a. We visited Zimbabwe, Zambia and Malawi	<ul style="list-style-type: none"> Learnt new farming methods, including pot-holing
2006	a. Our members visited Qacha's Nek	<ul style="list-style-type: none"> Learnt from other farmers
2007	a. We started fundraising	<ul style="list-style-type: none"> Raised funds for buying seed
2008	a. We managed to buy seeds	<ul style="list-style-type: none"> We managed to have our fields planted

7.3.2.2 Lessons from the histories

The main lesson learnt which arose from group presentations was one concerned with improving the design in MFS through adjusting plant spacing. The farmer innovator was asked to prepare a presentation for the following day. The Figure 7.4 that follows shows the nature of changes as he presented them and the process of the innovation was summarised as follows:

- a. Farmers who were trained on how the MFS works were eager to get the benefits associated with MFS, that is, increased yields, so they adopted the practice;
- b. Farmers did realize the results, but the amount of output was not what they expected and they asked MFS facilitators whether there were ways of manipulating the system

so as to optimize the spaces that were between crops especially potatoes (two metres apart).

- c. The farmers and MFS facilitators from RSDA negotiated and agreed to reduce the spacing between rows of potato plants from two metres to one.
- d. Some of the farmers took it upon themselves to try the new system (changes were in spacing and intercropping patterns) i.e. reducing the space from two to one metre.
- e. The other changes were that in the old system, maize, sorghum and beans would be sown in one row, in the new system, maize would be sown with beans in a row and in another line it would be sorghum and beans. This reduced competition for nutrition between grain crops that are non-nitrogen fixing and had been planted together.
- f. In addition, another line of beans was added with the idea of increasing the yields of this crop and indeed farmers realized that there is more yield in the new system than the old system.

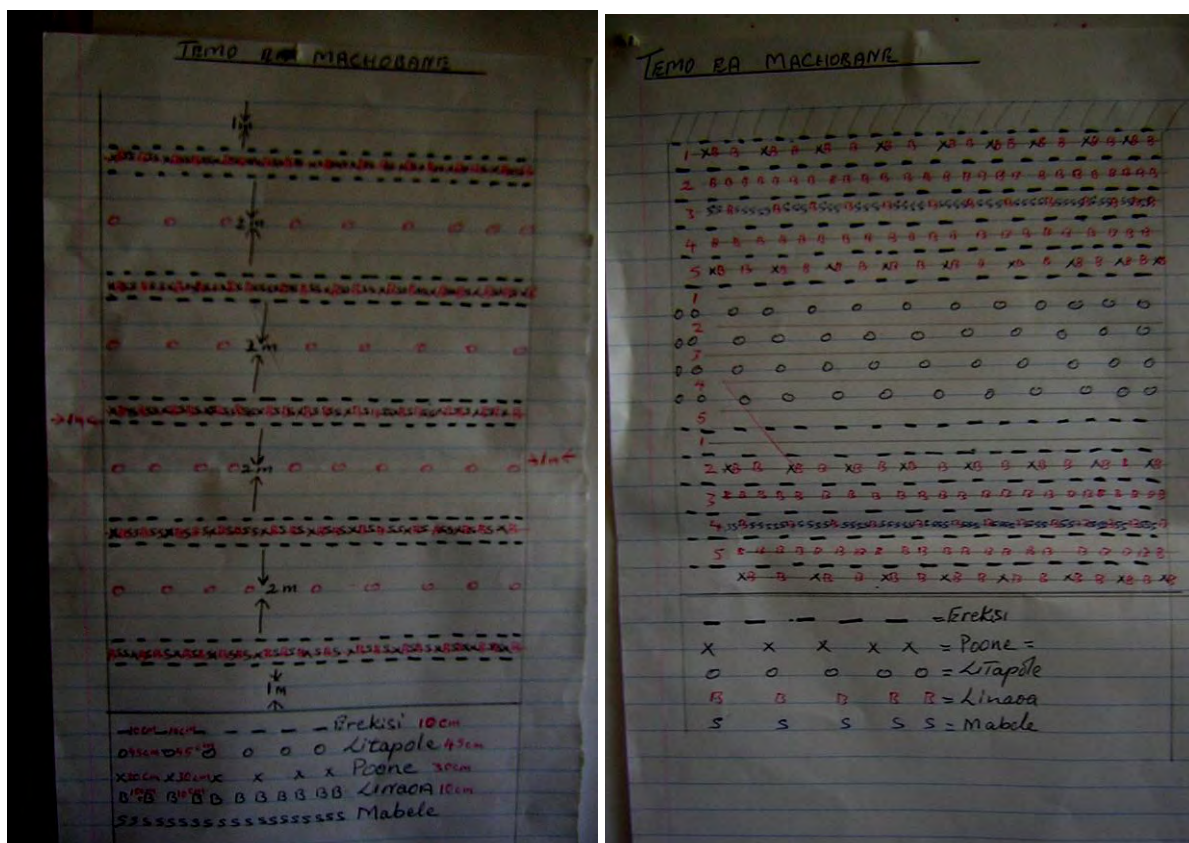


Figure 7.4: Comparison of MFS cropping system before and after the innovation

Participants congratulated the farmer group for the innovation and invited one of the farmer innovators to make a presentation to the full group of MFS farmers in Mohale’s Hoek district after the workshop. The sharing of this innovation is a good example that shows how farmers learn everyday as well as how the CL workshops were used as sites for horizontal learning.

7.3.3 Selection of contradictions to work on

Of the nine contradictions identified and discussed earlier (see Sections 6.4.1 to 6.4.4, Table 6.3), MFS CL participants worked on two (the other three were real problems and not contradictions). Selection of problems to work on was achieved through scoring and ranking. One of the contradictions, between the need to obtain government buy-in of MFS and government interest and capacity (see Section 6.4.2.2), manifested in mutual distrust and lack of cooperation between the government extension workers in the districts and MFS promoters. The second contradiction that was examined between corporate and government tools and interests on the one hand and local community resilience on the other (see Section 6.4.1.4). With regards to the latter, the workshop focussed on how the seed policies are currently skewed in favour of seed companies at the expense of building local capacity and therefore resilience, as opposed to dependence.

7.3.4 Analysis of contradiction between the need to obtain government buy-in of MFS and government interest and capacity

Participants in the MFS CL workshop analysed the tension between government policy and practice in terms of causes, effects and the evolution of the contradiction.

Table 7.5: Contradiction between the need to obtain government buy-in of MFS and government interest and capacity

Contradiction	Causes	Effects	Trends/History (with additions from Machobane & Berold, 2003)
Between the need to obtain government buy-in of MFS and government interest and capacity	<ul style="list-style-type: none"> • In the past there was fear that the innovator had a political message and ambition. • There is no joint planning. • NGO don’t report to government/Ministry. • Government does not allocate budget specific for MFS practice. • Local government does not budget for MFS practice. • Extension workers do 	<p>Farmer who work with MFS NGOs ignored by government extension system.</p> <p>MFS work is stigmatised and marginalised as backward.</p> <p>The potential of MFS is lost to most farming communities as only about 2,000 households practice MFS in the country.</p>	<ul style="list-style-type: none"> • 1944-1956: Machobane conducts his 13 years of research on MFS at Nqechane. He establishes a college which offers a 5-year MFS course for farmers. • 1957-1959: The Machobane Farming System gets taught to farmers for the first time and 200 farmers produce bumper harvests of potatoes. • 1965: The Machobane Agricultural College is forced to close by government and he lives in semi-hiding till 1980. • 1990-1993: Machobane awarded doctorate in honour

	<p>not know about MFS because the practice is not taught to them.</p> <ul style="list-style-type: none"> • MFS organisations perceived as protecting MFS sacred wisdom from outsiders. 		<p>of the MFS by the National University of Lesotho. Several NGOs adopt and promote MFS and Foundation set up.</p> <ul style="list-style-type: none"> • The government acknowledges that MFS has an important role to play in the agriculture of Lesotho and MFS now forms part of government policy.
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7.3.4.1 The initial group solution

The proposed model solution was to have farmers mediating talks between the government and NGOs. The idea was for farmers to serve as mediators, and the aim was for NGOs to listen to government. But the model solution did not sit well with other participants in the workshop who felt that the “whipping of NGOs into line” was not the answer. This solution therefore became the subject of examination during a subsequent session of the workshop.

7.3.4.2 Examination of the group solution

The following discussion was held in Sesotho and translated into English during the session. It was important to highlight the source of the contribution because in the end, it became clear that it was not government agricultural extension workers but farmers who were arguing for government to exercise power over NGOs (participants included the head of the district agricultural extension)

Participant (extension officer): *It is not farmers who can force or influence NGOs to work with government. NGOs should align their mission with that of government. NGOs should realise that their interventions are short-term. Government should train NGOs.*

Researcher: *How would this address the problem of lack of support for farmers?*

Participant (farmer): *If these two can work together then the farmer will get better support. Now, for example, you can have some farmers in a village supported by NGOs while others get support from government. When the NGOs project ends and it leaves, the government cannot take over or help the farmers who were working with the NGOs because they do not know or understand what was going on.*

Participant (farmer): *If these two work together, what would happen when directives are given by government?*

Participant (farmer): *In that case, the NGO person would stay with the people and the civil servant goes away to another area or to do another assignment following the government directive.*

Researcher: *What else can be done to address the problem?*

Participant (farmer): *Who exactly are these government people going to train?*

Participant (farmer): *They can train the NGOs on how to work with farmers, on approaches because we should not confuse farmers by coming with different farming methods.*

Researcher: *Who should decide on which approaches to use in working with farmers and what methods of farming to promote?*

Participant (extension worker): *The government and NGOs must come together and decide on which approaches and methods to adopt.*

This discussion in the plenary showed how participants moved from blaming one development actor to seeing the two actors – the MFS-promoting organisations and the government agricultural extension department – as occupying different but related development niches, which could be synchronised. An important but hidden message in this conversation is what appears to be the „territorial“ behaviour of both NGOs and government. The NGOs seem to keep the government in the dark about what they are doing, or perhaps more accurately in the case of the MFS, how they are doing what they are doing, making it impossible to take over. This leaves farmers whom they were working with vulnerable, and excluded from government support because they were working with NGOs. The revised solution of coming together to strategise jointly is sound, if it is carried out in the spirit of synergy, not co-optation of one by the other. The agreed model solution therefore was: MFS-promoting organisations and the district agricultural extension officers should meet and discuss how best to work together so that MFS can be better practised in the Mafeteng district. Such a meeting had potential to shape future NGO-government relations on government support of the practice.

7.3.5 Analysis of the contradiction between corporate and government tools and interests on one hand and local community resilience on the other

Research participants also examined the above contradiction and modelled a solution to it during a CL workshop. The solution, generated in group work, was presented and critiqued in a plenary session. Table 7.6 below shows a summary of the analysis of the contradiction.

Table 7.6: Contradiction between corporate and government tools and interests and community resilience

Problem	Cause	Effect	Trends	Solution
Lack of seed supply	<ul style="list-style-type: none"> • Limited seed production (there are only two seed producers in the country) • Import dependency • Tough seed certification requirements 	<ul style="list-style-type: none"> • Late planting resulting in low yields 	<ul style="list-style-type: none"> • Declining as there are some initiatives in place to address the problem • Started since the introduction of hybrid seeds • Employment opportunities in mines made it easy for procurement of hybrid seeds • Due to retrenchment, farmers resort back to Open Pollinated Varieties of seed and depend heavily on Government donations 	<ul style="list-style-type: none"> • Farmer training on seed production should be held • Follow up on seed policy

The two-pronged solution that was developed here was agreed upon by the participants. Worth noting is the fact that one aspect of the solution is educational and knowledge-based, and the other is political and dependent on the collective agency of participants in a policy

space. The progress made by participants in addressing the contradictions in their workplaces through the expansive learning process is summarised in Figure 7.5.

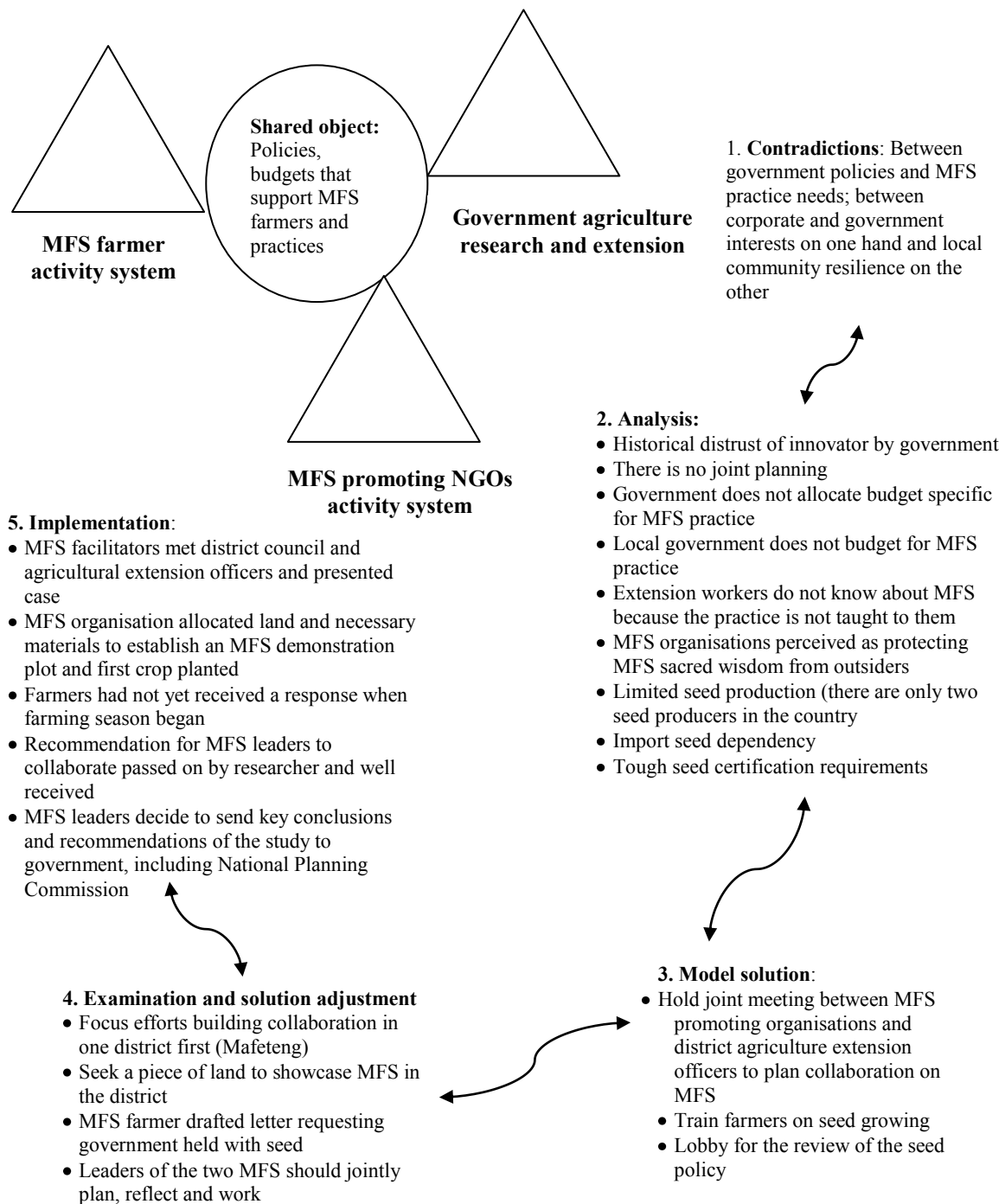


Figure 7.5: MFS expansive learning process

7.3.6 Implementation of model solution

About seven months after the development of the solution, a feedback workshop was conducted with MFS farmers and facilitators. Extension officers could not attend because

they were distributing agricultural inputs. The leaders of the two MFS organisations could not attend either but a group interview was subsequently held with them.

The main progress that had been made with regard to the model solution was that MFS facilitators and Mafeteng agriculture extension officers met to deliberate further on the nature of cooperation. This resulted in an MFS facilitator being invited to attend a council meeting in which the idea of setting up a demonstration plot was presented to the council and accepted. The council undertook to provide material resources and human labour while the MFS-promoting organisation agreed to provide the expertise. The plot was planted using MFS design principles and in it potatoes, peas and wheat were intercropped (I visited the site). This was an important step towards the planned collaboration.

MFS farmers from Mafeteng indicated that a month before they had written a letter seeking agricultural input assistance (seed) from the agricultural authorities in the district but they had not yet received a response. The feedback workshop invited MFS facilitators to help the farmers and the government officials to talk on the matter.

Commenting on the summary of key findings and recommendations, participants agreed but added another contradiction which was concerned with the current „individualistic“ approach of the leaders of the MFS-promoting organisations versus the need for partnership between them. I added this concern and conveyed it to the leaders when I met them on the same day and they undertook to work together. One of the important developments from the feedback mission was that one organisation got to know that another was producing and selling manure and this one learnt that the other was keeping dairy cows (which produce dung that can be used for compost making) (see Section 8.5.4).

7.3.7 Conclusion on expansive learning in the MFS case study

The MFS case study expansive learning process shows how actors from the related activity systems met in a CL workshop, identified a common object, surfaced critical issues and developed model solutions to some of them. It also discusses farmer innovation and how the CL workshop was utilised to share an innovation as well as to plan for its wider spreading. An analysis of participants' evaluation of the CL workshop suggested the horizontal learning about the practice; and the meeting and thinking together between farmers, MFS facilitators and government extension personnel was valued.

In response to the question of „any other comments“, the following responses were made (again comments meaning the same thing or too general have not been included here):

Trainers must give us more knowledge about the system next time when we meet in workshop like this one.

- a. The most important thing is to share knowledge and information with farmers.
- b. Training like this shouldn't take long time to happen again. And I would suggest that they be held in every three months to refresh our minds about this useful information.
- c. Next time we have a Machobane system workshop we would like to have at least some leaflets or booklets explaining the technique in depth.
- d. How can I be trained with Mohale's Hoek farmers if I don't have farmers in Mafeteng?
- e. We need to work with the Government to spread Machobane system.
- f. I would suggest that whenever there is this kind of training every sector should be represented e.g. Ministry, NGO's, Chiefs as well as farmers who practice different farming systems.
- g. I think it would be good if I was trained on the system before I come to the workshop that is why it's difficult on my side to say (a way forward) or to answer that question.
- h. Is there anything that the researchers are going to do with the information got from Basotho people? (see Case Record Section 4.6).

Comments (a-e) above seem to suggest that participants viewed the workshop as a learning opportunity; they mentioned training, information sharing, knowledge sharing, refreshing our minds and time to learn. This view is in line with the object of the study. The next two comments (f and g) reveal that participants are aware of the „causal powers“ of government, especially the Agriculture Ministry, the Chiefs, who are local leaders and the NGOs. Comment (h) appears to be an appeal by an agricultural extension officer to be taught MFS in order to be able to participate better. The final point is raising an interesting question about the research, whether it was going to be fully beneficial. There is a clear idea here that this is our information – mirror data, the analysis and the solutions, and a question about what will be done with this information. In this workshop as in the others, I made it a point to leave all written flipcharts with research participants. I also compiled and shared reports of each workshop and a summary of what emerged from the interviews. But more importantly I went back seven months later to give and obtain feedback (see Section 4.3.3.2). Some internal challenges emerged within Developmental Work Research (DWR), namely time spent in the field and the relationship between the field and the cabinet. To address this tension, I have developed a set of tools that can be used by NGOs and farmers themselves in developing DWR as an extension methodology (see Section 9.4).

7.4 EXPANSIVE LEARNING PROCESS: ISIDORE ORGANIC CASE STUDY

7.4.1 Introduction

The Isidore CL workshop took place over four days (3-6 August 2009) at Isidore Organic Farm in Assegai, Durban. Each day's meeting lasted an average of three hours. It was attended by organic farmers; organic trainers; environmental educators; retailers; NGO leaders promoting rural development; community development facilitators; organic farm workers and a smallholder farming development sponsor. Most participants attended less than

four days of the workshop due to other commitments. The process of the workshop enabled those who joined late to catch up with others as there was a recap at the beginning of every session/day. Daily levels of attendance fluctuated, with the highest attendance being 12 research participants, and the lowest, six. All in all, 16 research participants in the Durban organic sector plus the researcher and research assistant attended the workshop.

7.4.2 Developing a shared vision

From the deliberations on motivation, the following overarching shared vision emerged: *“Human health, wealth, and environmental sustainability”*.

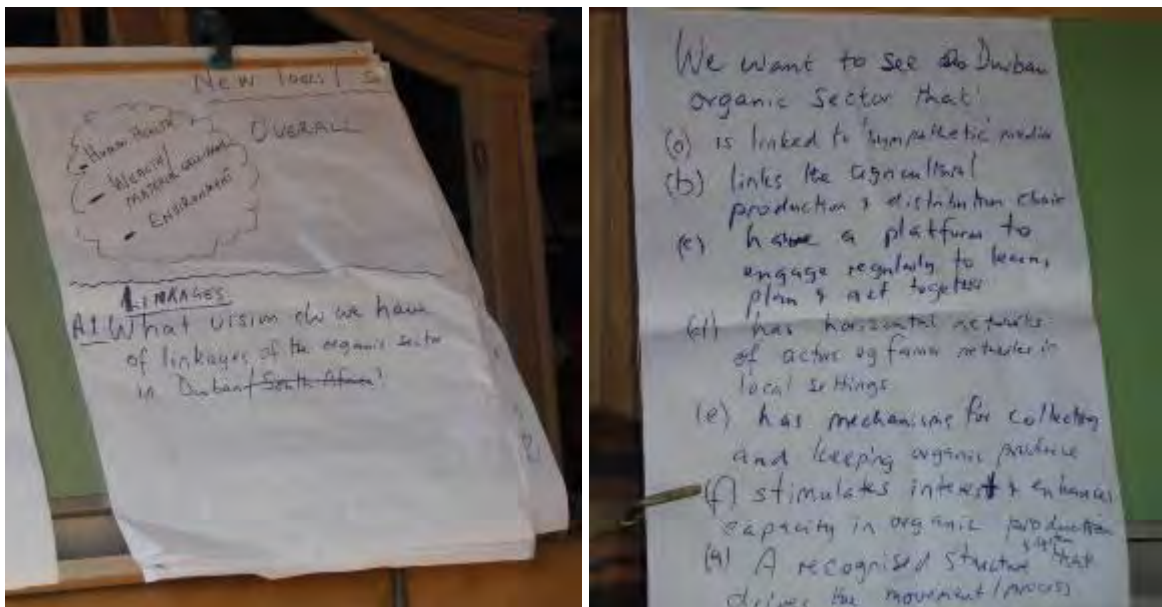


Figure 7.6: Isidore research participants’ vision of organic farming

Research participants in Case Study 2 developed two levels of visions: one was the bigger and more general. The other (see Figure 7.6, picture on the right) was their shared object of the organic sector in Durban. The shared object underlined the need for establishing a recognised structure made up of organic farmers, organic trainers and marketers as well as local government. The shared object was also around building vertical and horizontal linkages in the sector as well as having moments for collective learning, planning and reflecting, while at the same time recruiting more relevant groups of people to join.

7.4.3 Problem analysis, synthesis and selection

After the definition of the shared object, participants went on to synthesise learning and practice issues that they were facing (see Sections 6.5.1 to 6.5.4). In order to choose the contradictions on which to work, each participant was asked to choose their most important issue by indicating the number on a piece of paper and the following were selected in

descending order. Only three of the contradictions were scored against with totals as indicated below:

- Between the pedagogical strategies employed and farmer learning and practice needs (6).
- Between time needed to make money and time needed to build the productive capacity and safe production of food (2).
- Between external organic farming rules and the local socio-ecological conditions (rules) of farmers and farming (1).

From the above scoring, the problem contradiction of pedagogical strategies and farmer learning needs and practices ranked highest while the one on external market requirements versus local internal market capacity ranked lowest (third). I shared a framework for analysing problems before developing solutions which was linked to the expansive learning process. I recommended that the workshop process and the learning and development method being employed in the study preferred to follow the four steps in this framework because the solutions generated were likely to be deeper and superior to those generated without going through the necessary steps. Figure 4.4 summarises the process, which allows its user to pause and look beneath the surface, the obvious and the immediate.

7.4.4 Analysis of contradictions concerned with linkages

As the facilitator of the workshop, I negotiated with participants so that they work on their third choice because of its relative concreteness to their experiences and they agreed. The process of analysing the problem and developing a model solution was guided by the expansive learning cycle. The participants concluded that there are limited linkages between: trainers and retailers; farmers and retailers; farmers and agro-processors; farmers and seed (open-pollinated) producers; farmers and producers of tools and equipment for organic agriculture; NGOs and consumers; donors and organic farmers; government and organic farmers; environmental education bodies and the organic farming movement; the organic farming movement and opinion makers such as the Nelson Mandela Foundation. Other poor connections were identified in terms of consumers not knowing enough about nutrition; the public not knowing the effects of agro-chemicals on the health of the soil, water and biodiversity; the disconnection between lay/local knowledge and scientific knowledge, the old and the young.

Workshop participants gave the following reasons for the lack of effective linkages in the organic sector of Durban:

- a. It is currently difficult to make money in the organic sector and meet the costs of relating and networking;

- b. There are cultural barriers which are manifested through poor understanding of one another and low levels of trust;
- c. Poor communication across the sector is coupled with poor listening to one another;
- d. A strong culture of individual approach to work and little in the form of joint work fostered by failures of cooperatives in the past; and
- e. Inadequate infrastructure to support the organic farming movement, ranging from lack of collecting centres in rural areas, to monitoring, mentoring and inspection capacities.

One of the interesting points to note from the analysis is how participants brought in some of the contradictions which had been identified as separate and distinct from that of linkages, the main ones being:

- Between messages agricultural messages brought by conventional agriculturalists and those brought by sustainable agriculturalists; and
- Between time and resources allocated for supporting farmer learning and time and resources needed for it (see Section 6.4).

7.4.5 Modelling a solution to address poor linkages in the sector

7.4.5.1 Developing and choosing between two models

Participants broke into two groups, to develop a solution to the linkages problem. The discussions took about 45 minutes. Both groups focused on a solution to establish a structure that would mobilise the actors in Durban towards the stated vision (see 4.4). However, there was a difference in terms of where to begin, which can be summarised as:

- a. Group A proposed the development of linkages around a structure that was already there – a retail business, Earth Mother Organic.
- b. Group B proposed the establishment of a new structure, a Durban Organic Forum.

After plenary discussions, participants agreed on the establishment of a Durban Organic Forum, because they felt it was important for the forum to have a distinct and separate identity from that of Earth Mother Organic as it was intended to draw in actors and stakeholders along the length of the value chain (and not only those focused on retailing). Under the agreed arrangement, Earth Mother Organic would become one of the many potential members of the forum. Figure 7.7 that follows shows a representation of what was agreed as to who would constitute the members of the forum (subjects in CHAT) and the main stakeholders of the forum (community in CHAT).

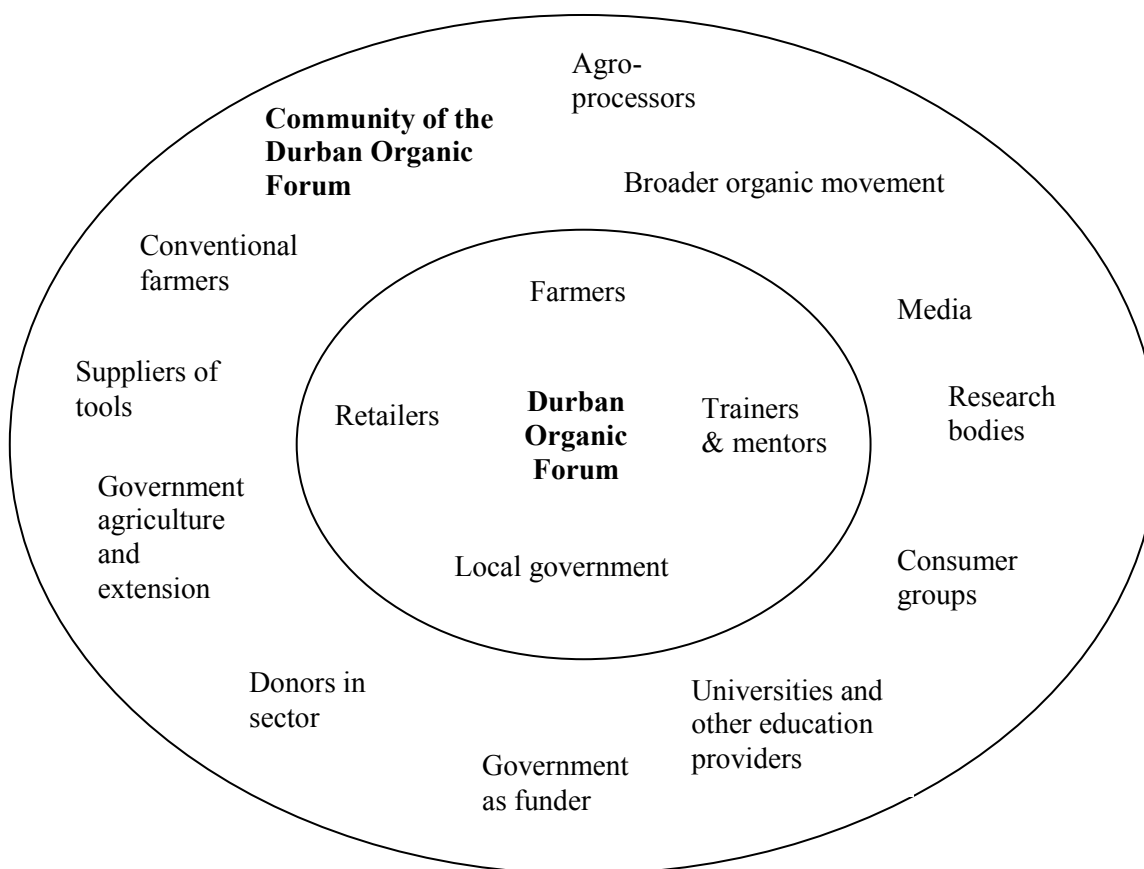


Figure 7.7: Durban Organic Forum composition and stakeholders

The next part of the solution generation process was to define details of who would do what in the proposed forum. Research participants found it imperative to make further distinctions among three of the four actor groups because they would contribute and benefit differently as the table below shows (Table 7.7).

Table 7.7: Roles of members of the proposed Durban Organic Forum

Who should be part of the forum?	Why they should be part of the forum:
Retailers: <ul style="list-style-type: none"> • Informal • Formal 	<ul style="list-style-type: none"> • To provide the infrastructure and income that drives organic farming • To link producers and consumers; demand and supply
Farmers: <ul style="list-style-type: none"> • Subsistence • Emerging • Successful/ Established 	<ul style="list-style-type: none"> • Subsistence farmers to initially focus on seed and seedling production because they have small holdings • Subsistence farmer improvements are instrumental in community development • To enhance farmer self-reliance across the board • To link selves to markets and suppliers • Farmers provide „Jay“ and local knowledge and receive other forms of knowledge • Emerging and successful farmers provide opportunities for local employment

Trainers: <ul style="list-style-type: none"> All levels of trainers Mentors 	<ul style="list-style-type: none"> Support farmers to learn new agricultural and marketing ideas Provide „neutral“ and ongoing support to farmers in terms of production, marketing, pricing and quality control Gather lay and local knowledge and share it
Local government	<ul style="list-style-type: none"> Help in the provisioning of local infrastructure for farmers and retailers Develop by-laws that govern the marketing of produce and where this can take place

7.4.5.1 Guidelines for setting up a core group for the Forum

Participants agreed to establish a core group of people to coordinate the further development and actual implementation of the forum to address the weakness of linkages issue in Durban.

Members of the core group should:

- Have vested interests in the success of the idea;
- Have demonstrated passion for organic movement;
- Have the time to invest in the implementation of the idea; and
- Be chosen from the four main groups identified by the workshop.

Some of the proposed principles to guide the formation and functioning of the Durban Organic Forum were suggested as:

- Members of the forum should commit to providing community services in the organic sector, especially to farmers in order to grow the sector;
- The forum should start small and grow organically;
- The forum should develop a vision of growth which would ultimately expand to include some of the actors in the outer circle (Figure 7.7);
- It should promote values of organic farming, which include fair trade, accountability and transparency;
- The forum should build and enhance the spirit of partnership between and among the actors along the agricultural production chain towards the holistic organic movement picture of *human health; material well-being and ecological health*; and
- Work towards establishing linkages with like-minded organisations in the sector, within Durban and beyond.

Activity	Person responsible
1. Compile minutes of the Durban Organic Farming workshop and circulate them to all participants.	Researcher
2. Identify interested individuals from each stakeholder group to form the core team that will drive the process of setting up the Durban organic forum.	BM
3. Identify existing organic movement structures in Durban and build a „database“ of them.	Core group
4. Identify further issues and working ideas in the organic sector.	Core group
5. Convene a meeting to deliberate on the identity of the forums, including on how it would operate, who would be members.	Core group

The diagrammatic presentation of the Isidore Organic expansive learning process is represented in Figure 7.9 that follows.

7.4.6 Examining and remodelling the solution

Nearly three months after holding the CL workshop I conducted a feedback visit and was able to meet four of the research participants and hold semi-structured interviews with them. They were built on two three main questions concerning what they did since the last workshop, the challenges they faced and what they planned to do in the future. The responses suggested that considerable progress had been made with regard to the elaboration of the solution that emerged from the workshop. The elaboration was achieved through obtaining relevant information from the Internet, attending food security meetings and talking to professionals in the field of organic agriculture. However, this research had been conducted by two research participants, which remains an area of concern. The following have happened in connection with the elaboration:

- The formulation of a name for the forum into the Green Growers Association;
- The development of a logo for the Association in order to have a clear identity (see Figure 7.8). The logo will be used to label products from members of the Association. This will be through the use of stickers.
- Recruitment of other actors in the sector such as Information, Communication and Technology ICT specialists and organic inspectors.
- The re-definition of the forum/association in line with the international concept of Participatory Guarantee Systems (see Section 2.5.5.2), which provides for peer review and transparency in the „approval“ of organic products and avoids the expensive route. One of the roles of the forum would be to link consumers and producers in the district and even provide for events where consumers of organic produce could visit producers. Depending on how this is operationalised, consumers may join the inner group and become subjects.



Figure 7.8: Green Growers Association logo

The other important feedback from the research participants in Case Study 2 reflected that even though progress had been achieved in expanding and elaborating the object, and even including more people, some stakeholder groups had so far been left out. This was to constitute a new contradiction within the new activity system that actors were to handle on their own. In particular, the following issues were raised concerning the Green Growers Association:

- Its treatment as a quasi-family initiative;
- Its limited geographical coverage, which was seen as primarily urban (Durban);
- Its focus on drawing produce into Durban rather than help producers to establish selling/marketing hubs in their areas; and
- Having a strong economic dimension but inadequate social thrust partly reflected in who was invited to join the core group that was to drive the initial process.

The most important next step was for them to convene a meeting of the members of the core group and discuss details of how to move forward, as well as the framing of a constitution for the association. The figure below (Figure 7.9) shows the expansive learning process in Case Study 2 during the course of the research.

7.4.7 Implementation of the model solution

About one month after the CL workshop, the process of implementing the model solution had begun. The organic marketer was invited by one of the funding partners who had attended the workshop to visit two different groups of small-scale organic farmers in rural Durban. Her talk was presented to both NGO members who support the farmers in agricultural production and to the farmers who produce organically and who had surplus to sell. However, there were some challenges connected to open engagement between the farmers and the organic marketer on one hand, and the NGO representatives from the local community and the marketer on the other, which could be seen as a form of resistance to the new solution. From the data generated in the study, this arose from the history of not having worked together:

Donor FV: I think EV was presenting an invitation to all of us, let's work together. We can do the marketing if you link up with the farmer. But there was that silence that other side. There was a lot of dynamics at play. Some of it had also to do with the racial balance of the evidence. You know the Zulu side kept quiet, the white side was talking and challenging and seeing the opportunity and potential so it was to me a bit of a weary feeling in the sense that there is this inhibition to cross racial lines and talk openly without any inhibition. And there was also the NGO sector that was sitting there passively listening and then going home with what kind of idea I do not know... I mean I would have hoped that the NGO representing would have immediately talked to Eva and said, „Give me your number“. (Feedback interview SA #11)

Newly emerging tensions and contradictions reported in the feedback data shows that expansive learning is an ongoing and open process and that change oriented learning is not a

one-off event. This poses challenges for DWR processes particularly relating to prolonged engagement in the field. Figure 7.9²⁴ below shows the expansive learning process in Case Study 2 during the course of the research.

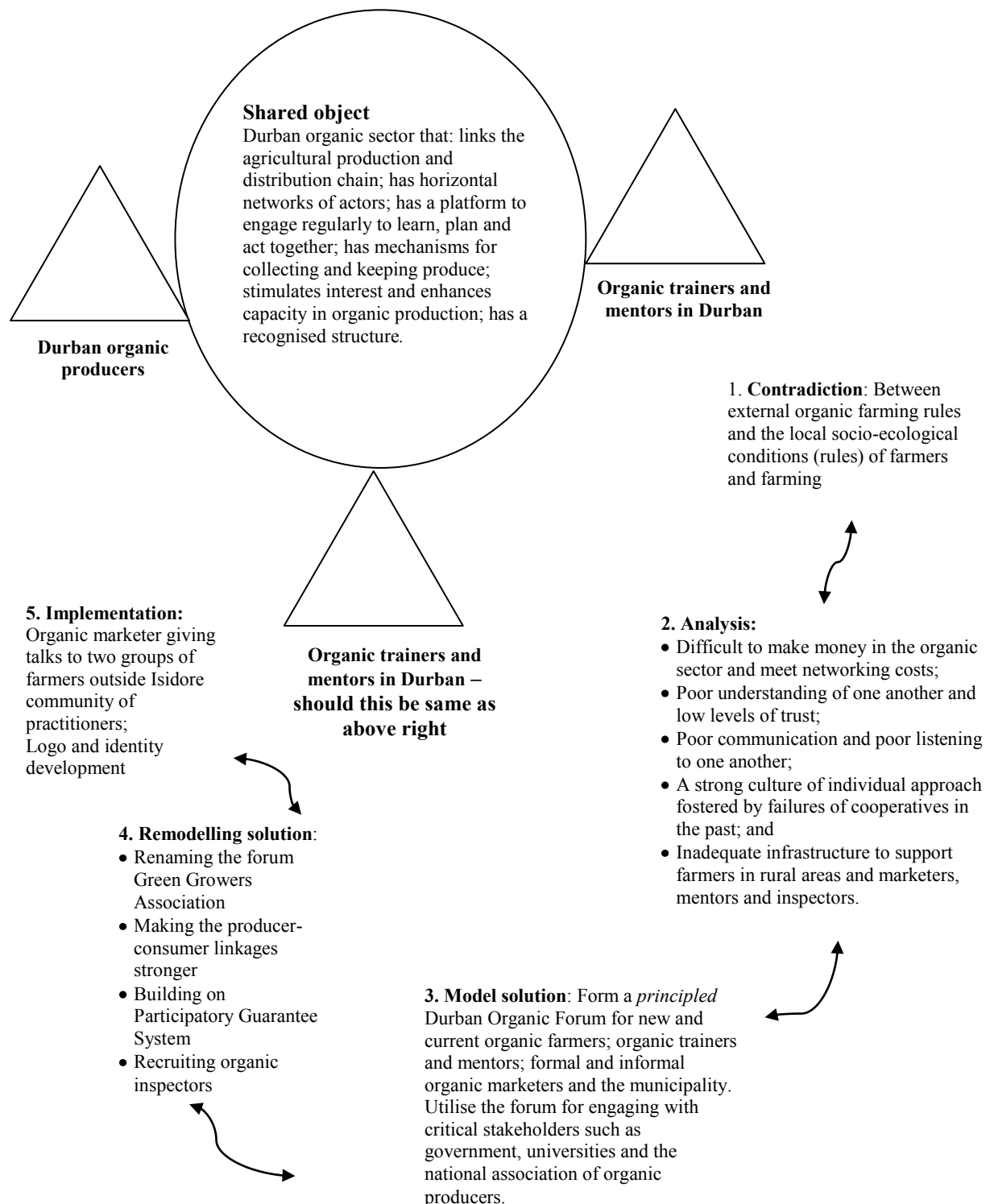


Figure 7.9: Isidore Organic expansive learning process

²⁴ The table has several 5s because there were many instances in which the modelled solutions were reviewed.

7.4.8 Conclusion on the expansive learning process in Isidore Organic

The expansive learning cycle in Case Study 2 benefited from lessons learnt from processes conducted in the other case studies (see Section 4.8.3). What is evident in the expansive learning cycle is that it is likely to take several months before the Green Growers Association can function and make a difference. At the same time, it is clear that the CL workshop helped to activate this learning and development process. Using a critical realist perspective the causal mechanism that explains the linkages related contradiction being addressed can be defined as indifference as Dean (2006), put it:

In the Marxian account, contradictoriness inheres in the spatio-temporal separation of necessary relations, practices and processes which promote the „indifference“ of these separated elements to one another. „Indifference“ expresses here a kind of „objective“ unawareness of necessary interdependence (i.e. between production, circulation and consumption of goods) which, beyond a certain point, results in crisis. (p. 136)

The solution that was generated in the study exemplifies how interdependence can be recreated and the absence of elements and people that were necessary for the proper functioning of the organic sector addressed.

7.5 CONCLUSION

This chapter discussed how the research participants and I, as a developmental work researcher worked together along a learning and development journey each playing a role and contributing something to the questions under review. Change laboratory workshops were a place where research participants were able to gain distance from their daily activities in order to reflect on them – from their fields and offices. In a sense therefore, the CL workshops served as the cabinets in the field. CHAT was used, drawing on the Developmental Work Research methodology to provide a vantage point from which to surface contradictions faced by farmers, sustainable agriculture facilitators and organic marketers and to work on them drawing on the distributed cognition²⁵ available in the „room“. This allowed us to elevate issues into sight for a more profound engagement with them. The learning that took place in the workshops was based on farming practices and related activities of the research participants. The research process and approach illustrates the „researching with“, the „joining of hands“ orientation characterised with a levelling of the traditional power gradient between researcher and participants, without erasing the distinct roles that each played. The chapter also shows how the research was harmonised with what was going on in the lives of the research participants and how they exercised their agency to address some of the learning and developmental issues that they faced – situated learning (see Section 2.5.4.3).

²⁵ This refers to knowledge, expertise and ideas being found across different members of a social group.

The expansive learning process helped participants to develop model solutions to some of the problems they are facing in workplaces, including the invisible dimensions. They appreciated the expansive learning process and are likely to work with these processes of collaborative engagement beyond the intervention workshops. This was evidenced by the processes that took place in each case study between the first CL workshop and the feedback meetings and workshops that occurred several months later. The workshops provided opportunities for improving relational and collective agency. In the case of the Permaculture teachers, pupils and farmers in St Margaret in the SCOPE case study, the research showed how intervention workshops can transform practices. The next chapter (Chapter 8) focuses on micro-aspects of the research process in order to provide further depth to expansive learning explanations provided in this chapter and to draw out lessons and concepts that can be useful beyond the study sites.

CHAPTER 8: Micro-analyses of Expansive Learning Processes across Case Studies

8.1 INTRODUCTION

The previous chapter (Chapter 7) discussed the expansive learning process and how it was worked with in the field with research participants. This chapter marks my retreat into the „cabinet“ at the university, taking a distance again from the field. Our sculpturing together had happened and research participants continued with their lives while back in my cabinet, I needed to do another level of crafting. Based on the sensitising concepts that I had worked with in the research journey I decided to undertake a micro analysis of the expansive learning processes to draw out insights that could be helpful to fellow scholars in future and provide further depth of analysis that could explain the expansive learning process further. This was in keeping with reflexivity which is one of the three sensitising concepts of the study. At the same time, it was a direct response to the third research question (see Section 1.5) which is “How can sustainability be better learnt and more reflexively practised in the farmer’s workplace?” Since agency also became a central issue in the field as research participants sought to address their contradictions in a change oriented learning and sustainability practices context, looking at how people got ready to act appeared to be a worthwhile area to examine in the study. At the same time, as part of addressing the question of reflexivity among research participants I sought to establish reflective talk as well as some of the learning trajectories that took place in the expansive phase (see Section 4.3.3.2) of the research journey.

In this Chapter I begin the micro-analysis in Case Study 2, and not Case Study 1 because the Case Study 2 CL workshop was sufficiently detailed for me to find the space to engage with micro-analysis, which I then applied later to the other two case studies.

8.2 AGENTIVE TALK

8.2.1 Theoretical background of agentive talk

The process of observing agency and agential decision-making processes forms the focus of various contemporary social research projects. For example, Ruth Lister (2004) has developed a taxonomy of agency to explain forms of agency in contexts of poverty, and Margaret Archer (2003) has conducted research on the internal conversation or reflexive deliberations of individuals to seek to understand agentive decision-making in relation to social constraints. Lister, drawing on Sen’s (1999) capability thesis, argues that “what makes a difference is not only how those in poverty choose to act, but also how those with more power choose to act in relation to them” (Lister, 2004, p. 128). Both Lister’s and Archer’s

research on agency locates agentive decision-making in socio-cultural contexts, and draws attention to the importance of seeking to understand *relationality*, and the *socio-cultural historical contexts of agentive decision-making*. Their work does not, however, provide insight into the relations between agentive decision-making and *learning*. Edwards' (2007) work on relational agency feeds into an understanding of agentive talk too. She defined relational agency as "a capacity to align one's thoughts and actions with those of others to interpret one's world and to act on and respond to such interpretation" (Edwards, 2007, p. 4). In this study, CL workshops were used as processes and places to bring research participants together to share and align with each others' thoughts, to act towards a jointly defined object. And beyond the CL workshops, participants used committees and forums established during or prior to the CL workshops to pursue responses to the world together (see Chapter 7). Edwards also drew on work with Mackenzie (Edwards & Mackenzie, 2005), who defined relational agency as the „capacity to offer support and ask for support from others“ (Edwards, 2007, p. 1) (see Section 3.6.6). In this study there are a number of instances where research participants sought and offered support: in Case Study 1, the participants offered monetary support to get their electricity supply restored and at the same time obtained support from the local leaders such as the school heads, councillors and Member of Parliament (see Section 7.2.5). In Case Study 2, the marketer offered support to talk about organic marketing to small- scale farmers outside the Durban urban area and got support from a designer to develop a logo for the association (see Section 7.4.7). In Case Study 3, MFS facilitators sought local government support to establish a demonstration support and in turn gave their time and expertise to utilise the plot (see Section 7.3.6). Sannino's (2008) paper, *From talk to action: Experiencing Interlocution in Developmental Intervention*, provides a nuanced reading of agentive decision-making, focussing on processes of agentive talk in social learning processes. This space between thought and talk on one hand, and action on the other, is one that is often unexplored but one where the emergence of action can be seen. It is also an important area for understanding social learning in workplaces, and it is towards this space that the next section directs our gaze. In this chapter, the work of Sannino (2008) is used as a key theoretical tool for developing a micro-level understanding of expansive learning.

8.2.1.1 Sannino's discussion on agentive talk

Sannino (2008) bases her notion of agentive talk on Vasilyuk's (1988) theory of experiencing which was developed within Cultural Historical Activity Theory (CHAT). She defines experiencing as:

A process through which an individual, supported by others, is engaged in a quest to overcome critical situations ... the connecting factor between ongoing conversations and future-oriented actions ... a process through which an individual's disposition to act is prepared. (Sannino, 2008, pp. 240-241)

In short, she sees experiencing as the process through which the individual's disposition to act is prepared (Sannino, 2008) and she concludes that the transformative power of discourse, "resides not in the voices themselves, but in the way the voices are received and internalised" (Sannino, 2008, p. 244). In developing analytical means for identifying agentive talk, she draws on Trogon's (1999) interlocutory logic, which argues that transformations in educational and work practices through social learning processes, such as Change Laboratory (CL) workshops, are achieved through discussions and negotiations between multiple parties as shown in Chapter 7. She also notes that speech acts have illocutionary force and propositional content. Illocutionary force includes declaring, committing and asserting. When participants commit to doing something, it is called a „commissive“ speech act in interlocutory jargon, and therefore constitutes agentive talk – which conveys an intention to act in a specific way (Sannino, 2008, p. 240). Agentive talk includes indications that things are „doable“. Ahonen and Virkkunen (2001) concluded that shifts in talk are good indicators of breakthroughs and turning points in intervention processes. As discussed in Chapter 1, Engeström (2008, pp. 36-37) identifies five²⁶ forms of agency (see Section 1.6.3, Table 1.1), three of which are immediately pertinent to the conceptualisation of agentive talk²⁷. These are: explicating new possibilities or potentials by drawing from the past positive experiences; envisioning new models of the activity; and committing to concrete action.

8.2.1.2 An addition from Sen's work

The data from CL workshops was analysed using Sannino's (2008) descriptions of the „speech acts“ that get participants prepared for action, and Engeström's (2008) description of agency, to examine the likelihood that research participants would engage in actions as a result of the intervention process. The analytic tool also draws on Edwards' (2007) notion of relational agency discussed earlier. To do this analysis, four categories of agentive talk were developed, and used as units of analysis to examine the dataset from the Isidore Change Laboratory Workshop (Table 8.1). A fifth category draws on Sen's work on capabilities which argued that agency is not only about how people choose to act but also how those with more power choose to act in relation to them. This category of agentive talk can provide more insight into the reflexivity of agency in relation to structural points and power relations that influence agency, that is, ability to act, providing additional insights into how causal mechanisms (see Appendix 4.2) such as power relations influence cultural historical activity systems. I describe each of these five categories of analysis briefly below.

²⁷ The other two forms are: resisting and intervention through criticism, questioning and rejection; and taking consequential action to change the way things are.

8.2.3 Framework of analysis for agentic talk

Agentic Talk Category 1: Suggesting that something is doable/optimistic talk

Suggesting that something is doable, using retrospective experiences or prospective possibilities. This kind of agency in talk resides in its persuasion to act based on an argument that has worked before and therefore may be likely to work again, or based on an assessment of the future, that something may be likely to work.

Agentic Talk Category 2: Reaching mutual understanding

When different perspectives, voices and knowledges converge and participants agree on something, the ground for collective action is prepared. The bonding of ideas and bridging of distances between participants prepares their disposition to act. This may be found in what Sannino (2008) calls reciprocal discursive support, when individuals express a shift from personal to joint action. Under this category, I include instances where disagreements were softened and a level of common understanding reached.

Agentic Talk Category 3: Envisioning new models

This happens when the object of the activity is re-conceptualised and expanded and invested with new meaning or when the activity system is re-formulated to something more advanced. This is what Engeström (2008) pointed to as the third form of agency.

Agentic Talk Category 4: Commissive talk

This happens when participants commit themselves to taking specific action towards the object of the activity that they have constructed. It is a kind of talk that conveys the will to act, the will to do something.

Agentic Talk Category 5: Awareness of critical activity systems

The notion of critical activity systems was discussed in Chapter 5 (see Section 5.2). Awareness of critical activity systems becomes evident when participants as the agents show an awareness of how structures and systems and other activity systems or agents may enable them to realise their (shared) object (or not).

8.2.4 Analysis of agentic talk in Isidore CL workshop

The findings on how agentic talk evolved in one of the Isidore CL workshops are based on 459 turns of talking that were recorded and later transcribed from the end of the second day of the workshop to the end of the fourth day (see Case Record Section 3.6). The table below (Table 1) draws out instances where there was evidence of the different forms of agentic talk according to the categories discussed above, in order to identify the statements that carried agentic talk. What is significant here, is that it is *sequences of talk* that are important

(particularly in Category #2), rather than isolated statements, as these indicate the *relational nature* of agentive talk, characteristic of social learning processes.

Table 8.1: Extracts of data showing the nature of agentive talk in the Isidore CL Workshop

Nature of agentive talk	Evidence of agentive talk in the workshop
<p>Category #1 Suggesting it is doable, optimistic talk</p>	<p>Sequence #1.1 40. So what geographical coverage are we looking at? 41. I think that we should rather look at Natal [KwaZulu-Natal] rather than at national level. 42. What is the opinion of others? 43. I think if we can take it down to Durban, be area specific, just that ... because this area is fragmented. 44. I think we will all have a lot more to contribute to Durban specifically. ... 55. If you focus on Durban, I think you see it succeeding in the next couple of years because the guys there have really woken up to what it is all about.</p> <p>Sequence #1.2 69. Basically we have Earth Mother Organic as an established retail store and it is recognised also as a place of reference where people, the public and the market sector we [are] catering for ... can afford. We can meet and see something solid and it is a forum to actually sell organic produce. And it can be a model for other things. ... 87. This is what we are already doing. We are getting stock but the label is not Noah's ark, it is Earth Mother Organic... We are already doing the cash exchange story and that is working already. It is very small but it is working. ...</p> <p>Sequence #1.3 125. I think one of the weakest links is nutrition. It basically could help as a means, perhaps as a single most important contributing factor to the growth of organics industry in UK. They target the housewives and young mothers, sensitize them to health issues.</p> <p>Sequence #1.4 192. There is definitely the need for a forum amongst retailers I think we identified from our side that the problem of linkages comes out because of the lack of a forum, a lack of networking. 193. Not only retailers but growers as well. 194. Everybody, it covers lack of linkages between producer and retailer, between the vegetables and the market, a lack of forum, a lack of networking between these people. We identified that identifying tangible goals and processes especially a common need between the producers and retailers is definitely a way of sorting out these linkages. But the real issue at this point is a tangible forum.</p>
<p>Category #2 Reaching mutual understanding (note that sequences of talk / units of meaning making are significant here)</p>	<p>Sequence #2.1 118. After visiting the few farmers, the summary which came out of there of course it was a little bit mixed but the underlining [message] was that „<i>Permaculture sustains poverty</i>“: These are people whose mindsets are [based on] the conventional commercial farming [model] where you talk of so much harvest. So from that it will be like there was a lot of discouragement. We were representing NGOs and we were ready to go in but we were discouraged so we wanted to help poor farmers to come out of poverty because if this thing just sustains the poverty then why go into it? 119. So ... what one need[s] is like two sides of the story like a forum were you have got the conventional and the organic. 120. But what they saw was a reality because Permaculture, if not implemented properly, if the organic sector has not got its house in order like this ... then it is discouraging.</p>

121. And these are people well placed to spread the message but they have got the wrong message and that is what they are able to spread.

122. But would it not be interesting then to create such a platform like we are doing here? Would it not be interesting to get the experienced organic farmers and the conventional ones and see the pros and cons of each and see how they stand up in front of people such as yourselves who can support and have influence then you can make up your minds. Since we don't have the government behind us, we have to stand up for ourselves.

Sequence #2.2

283. I think what I'm hearing at this stage is as a starting point we want to work with a group of people at various levels that along the agricultural production and distribution and marketing chain in terms of organic production.

284. Yes.

285. Then I think once that is established and functioning we can begin to engage and possibly recruit other actors but in the beginning what would be important that we have fairly clear idea ...we have as a group of the converted in a sense.

Sequence #2.3

370. It seems to be more like a business strategy, an enterprise development.

371. Yes, that's what X said.

372. Yes, I think there is a dimension of business and there is also a dimension that is beyond business.

373. Social investment that is what we were talking about.

374. Yes, yaa [yes].

375. I would like to say we can buy into it and then co-create the identity.

Sequence #2.4

390. I think I must say something. I don't want to come across all of a sudden as ... I've come to this workshop and now hey this is a good idea. You know, this is something I've been working for many years and this is an evolution of the process, you know. So, I have a lot of people that are already in the network. This forum is already partly created... So I think that this should be noted in the study – that yes it has already evolved from sort of ground work laid before.

391. Yaa [Yes] for sure. It has just taken you this long to get to a place where you can launch it, refine it.

392. Yaa [Yes], find the direction in which we launch it because I went [inaudible] for many years with very little effect and it comes back to sustainability...

393. It also raises the question of ownership and ownership at two levels, ownership of the idea and ownership of the forum. And I think you might want to reflect a little more and see how you present that because if you are saying this is my party and I'm inviting you to it, it would send very wrong signals.

394. Yes but what I mean by that is my process has led me to understand that this forum is needed.

Sequence #2.5

420. Where do we meet?

421. That's to be discussed but I don't think that there is going to be a safe place.

	<p>422. Because we have some venue.</p> <p>423. The farm here, this is a productive place to get people together because of the fact we are doing it. This is it. And it has a massive impact on the workshop ... so will continue to use this. Part of my plans, I am moving this workshop [meeting place is normally used for carpentry] out of here on Monday to a factory in Pinetown. I'm freeing this place up so that this place so that it becomes more user friendly for what we are doing not only production but also in a production of this organic network so this would be a primary venue I suppose we call it.</p> <p>424. I was going to suggest decentring because we are going to have stakeholders to work with and you continue meeting at one place, it also creates, bring in dynamics so you may have your primary venue but it would be good to have something ...</p> <p>425. Yaa, yaa, yaa [Yes, yes, yes].</p> <p>426. It could be a starting point.</p> <p>427. Yes, within the structure of the forum there will be flexibility.</p>
<p>Category #3 Envisioning new models/ reconceptualising the object</p>	<p>Sequence #3.1 73. We need a vision to establish a platform of who are interested in practising organic farming to share information which enhances the farming practice. So this platform needs to be for people who are meeting each other regularly learning from each other to do better in what they do, communicate their practice rightly. ... 85. I am going to call it Noah's Ark ... It is very important that it has a label. It has got to have a mark recognition mark, Noah's Ark.</p> <p>Sequence #3.2 145. So we need that kind of a forum to reach out to these movements who communicate inspiration and things like that. 146. Like a figurehead? 147. In this case „Zuma goes organic!“ would be a good for us. [laughter] 148. We are talking of advocacy. It is about a champion. 149. Because a name like Mandela, trusted, brings forth everything. 150. This also comes back to what we originally said about having a label or stamp, a symbol.</p> <p>Sequence #3.3 231. Yesterday at the end of our discussion we basically agreed that we should set up an organic forum and we agreed that it would be at district level. We agreed who should part of the forum and what role they would play not only in terms of individuals it can also be groups or something like that and then the next question is what steps should be taken to set up the forum and by whom and if possible also look at the when, when we are supposed to do what. Then if we still have time we can discuss what problems we are likely to face in setting up the forum. 232. We must think of it as a constructive body rather than a loose arrangement. It has to be an entity. 233. It is encouraging not in a negative way because that is achievable. ... 235. The different people we invited, they all see the different components of the forum. Let's hope that they came back. 236. That's what we are setting up, it is a vehicle to bring and keep relationships together.</p> <p>Sequence #3.4 350. There is a final thing for me that I would like to include there. It is also under the trainers, why the trainers? The trainers need to be involved in the forum to realise that part of their processes need to incorporate lay knowledge from the producer. ...</p>

	<p>357. This is why we are setting up this forum; it is to be more sensitive. This forum is not so much to me, is not so much about yet another source of information. It is to encourage sharing.</p> <p>Sequence #3.5 432. The forum has to be target specific. It has to be structured like what we did with the process of this workshop. We started with 15 different things and created a hell lot of talking and excitement, a lot of interest but it took us five [4] days to get down to one thing that we can work with... In my opinion it needs to be taken one at a time, like for instance the lay knowledge of farmers, that needs to be a target of the forum so that we approach all the stakeholders from the internal ring and the outer ring, put through our networking possibilities of e-mails, telephones, letters and everything...</p> <p>433. And there will always be a section at the beginning of the meetings where one could do follow up of what happened at the one before, like a short summary of what came out of it.</p> <p>434. We can conclude that once you have done that, it's the job of internal group of the forum to then disseminate that information back out to everybody.</p>
<p>Category 4 Commitment to action</p>	<p>Sequence #4.1 186. What we are saying is that individuals such as ourselves are going to be responsible for establishing infrastructures.</p> <p>Sequence #4.2 218. I would like to establish another venue that will create a farmers organic market. So just to create more consumer awareness market so we will continue to look for a venue hopefully there we can build our foundation and do our meetings there and sort of try and create a central point of meeting and try and establish this thing that we are talking about the Noah's Ark.</p> <p>Sequence #4.3 417. So will you send the minutes of this workshop, the notes? 418. Yes. I think next week they would be there. I will send them.</p>
<p>Category 5 Awareness of critical activity systems</p>	<p>Sequence #5.1 55. [Part of a statement cited in category 1] So depending on where you go, and if you go to provincial government, then the organics will fail because of the attitude of the regional department. ... 64. I found that organisations tend to defend the position that exists. Therefore, they offer a lot of resistance to new ideas. So that was part of my agenda as well with regards to government representation. ... 93. Government will climb on board when the organic sector makes itself work, and then government will have an interest. 99. Four to five years ago South Africa was where it happened because we still have all the resources... The organics movement in places like Tanzania, Rwanda, Uganda, Kenya and the even the DRC was unheard of... South Africa is left behind. 100. Yes, they have come from nowhere and just a little bit of government intervention.</p> <p>Sequence #5.2 251. So I think that I agree that maybe having them [funders] is jumping the gun but what I think if one could present modus operandi that of people are results driven ... 252. So to sum that up as a forum we need to develop prototype that is not funder orientated.</p> <p>Sequence #5.3 70. It is a really interesting thing that we actually did a radio programme on Radio South Africa and the listening power and education that can happen in a little programme... So getting media involved is very important for linking up the customer and re-educating</p>

	<p>them about organic and conventional agriculture and what is happening.</p> <p>...</p> <p>124. So there is more need for media that goes into this kind of editions and not so much the Sunday Times.</p> <p>...</p> <p>369. We have already some credibility that we have established through our shop that has been established for so many years and have credibility with media and with the public.</p> <p>Sequence #5.4</p> <p>261. I think what you could still do is you could have this core group of the forum whose identity is the forum inviting different stakeholders at the different stages with an input at some stage for example you might want to engage with organic association of South Africa.</p> <p>262. And universities?</p> <p>263. Yes.</p> <p>264. But you will be talking to them while still being yourselves.</p> <p>Sequence #5.5</p> <p>431. I've got the voice I'll go and talk to anybody. There is no level that I'm too intimidate to go: the corporate , I can go and I can speak to Zuma [the President of the country] but I don't have all the ideas always in my head and so in a forum such as we going to establish it would be very interesting if we took themes.</p>
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8.2.5 Summative view of agentive talk streams, and discussion

This section discusses five main streams of agentive talk based on the five categories discussed above. In addition, it is also interesting to comment on how metaphors were used in agentive talk in the Isidore case. Danermark et al. (2002) noted that metaphor is an abductive²⁸ mode of inference which assists people to make meaning of complex discourses.

8.2.5.1 An organic forum of farmers, marketers, trainers and local government is doable

The categories and sequences of agentive talk identified in Table 8.1 shows that participants drew on their past experiences to suggest that a forum was a desirable and workable mechanism to address a contradiction in the activity system. In sequence #1.1 participants are confident that the forum is doable because it will cover a manageable geographical area, which also happens to be run by a municipality that has an understanding of sustainability issues. Sequence #1.2 shows that participants are optimistic because at least one of them has first-hand experience in networking between farmers and retailers and they have a working model which could be adapted. The next sequence draws on the fact that if using the nutritional value of organic produce has worked in the United Kingdom it should also work in South Africa. The final sequence under this category (Sequence #1.4) shows how participants concluded that the forum was workable: adequate and demonstrated interest in the idea, and there is a methodology available to help achieve this.

²⁸ Refers to interpreting something in context where individual phenomena are re-contextualised with the help of general concepts and categories (Danermark et al., 2002). Therefore metaphors can be used to show how people are interpreting the object of their study or work.

8.2.5.2 We have to establish a common understanding on certain issues for the forum to work

One participant raises the issue of the stigmatisation of Permaculture, and by extension, Organic Farming, as something that sustains poverty, suggesting that it would be difficult to make the proposed forum work. As the conversation progresses in sequence #2.1 participants explain to themselves why that perception is there, and conclude that this defines the need for the forum. Next (sequence #2.2) participants reach an understanding of who should belong to the forum – „a group of the converted“ and who the stakeholders may be. There were instances when mutual understanding was reached through a process of softening disagreements. There was also a question at some stage as to whether the forum should be primarily about economic development of its members, and it was agreed that it should also have a social dimension, to grow the sector (sequence #2.3). The next sequence (#2.4) shows how one participant, by virtue of having invested prior thought and already networking in the sector, seemed to claim ownership of the idea of the forum and how other participants and I, as the facilitator, helped him realise that he was going against the spirit of the forum. The issue of a meeting place which begins with two participants offering to host future meetings suggested either/or options, but an intervention from the facilitator made the conversation take a turn towards more flexibility – that there would be more than one venue (sequence #2.5).

8.2.5.3 Once we have a good idea of what we want, we will get there

The third stream of agentic talk is found in how participants co-construct a shared object which they also expand – the object of linkages in the organic sector of Durban. Sequence #3.1 outlines what kind of people should meet, for what purpose and adds a temporal dimension to the meetings. A metaphor is used to visualise the object „Noah’s Ark“, which brings to mind images of saving the Earth from perishing. Turn #3.2 highlights the need for making the forum visible and positively viewed through association with influential personalities. The characterisation of the new activity system is further described (sequence #3.3) where terms are employed to describe the forum, that is, „constructive body“, „achievable“, „imperative“ which denote possibility, responsible action and real need; and, „a vehicle“ to bring and keep relationships together, which suggests something moving, not static. Engeström (1999b) suggested that the object is like a horizon that cannot be fully reached. Within the new activity system, the role of the trainer is adjusted, from that of transmitting knowledge and skills to that which allows him or her to acknowledge and work with lay knowledge (sequence #3.4). This constitutes a linkage of different knowledge systems, which defines what constitutes agricultural cognition²⁹ (see Section 8.4.1) as bringing together the knowledge of different people in the agriculture sector: farm workers,

²⁹ The point draws on Engeström’s (1995) paper on medical cognition which involves both patient and medical practitioner.

farmers, organic facilitators, conventional farmers, conventional farming extension workers and even entrepreneurs. Sequence #3.5 adds more aspects to the nature of the new activity system by outlining how it can achieve focus and impact, based on the methodology used during the workshop. It also underlines the *boundary crossing*³⁰ that is taking place in the workshop through the establishment of the forum, by actors coming from different sub-sectors of the organic sector in Durban. Engeström, Engeström and Kärkkäinen (1995, p. 321) cite Suchman (1994) as having said, “crossing boundaries involves encountering difference, entering into territory in which we are unfamiliar, and, to some significant extent therefore, unqualified” (see Sections 3.4.2.3 and 3.6.4).

8.2.5.4 This is what we will do towards establishing the local organic farmers’ network

There were a number of instances in which participants committed themselves to action. Sequence #4.1, for example, makes a declaration that the participants are going to be „responsible for establishing infrastructure“. Taking responsibility is a form of commitment to action. The commitment made in sequence #4.2 is made from an individual point of view and is although out of sync with what was finally agreed about the forum; it shows a strong desire to have linkages established accompanied with a promise to send minutes within a specific period of time. The last sequence set under this category (sequence #4.3) is a commitment made by the facilitator/researcher to compile and disseminate a report on the workshop. The role of the facilitator is scrutinised later in this Chapter (see Section 8.5).

8.2.5.5 We have to engage our key structures and systems in our operating environment in order to realise our motives

From sequence #5.1 to #5.4 participants show their awareness of the causal powers that may reside in a number of structures in their operating environment. These range from the regional and national government, funders, media, the national organic association and universities. For example, they feel that they should only involve government when they are ready and if they involve it too soon they would lose credibility. They also see the potential benefits of having government on their side, citing how government support in other countries is transforming the organic sector there. This shows the workings of power relations, and is indicative of an understanding that collective forms of agency may be needed in engaging with more powerful agents and structures. The final commitment (sequence #5.5) is made by another participant who claims that she has the guts to meet anyone including the President as long as she has the ideas and backing of the forum.

³⁰ Engeström, Engeström, & Kärkkäinen (1995) define this as a cognitive process involving collective concept formation and this is the sense in which it is used here.

8.2.5.6 Metaphors and the zone of proximal development, a complex terrain

The use of metaphor was widely used in agentic talk associated with going through the zone of proximal development, from the current need state to a desired state and can be seen as a vital process of enabling change towards sustainability. The notion of „Noah’s Ark“ (sequence #1.2) was used to describe the more advanced activity system; the pupa stage of a butterfly (speech turn #168) was used to denote the relative immaturity and immobility of the organic sector in the area under study. Metaphors were used to persuade participants to not begin to make connections with other actors outside the sector because the participants were not ready to fly. A different metaphor is later used to describe the same sector under speech turn #197, which is not included in the table above.

Yes because basically we have got a baby the organic industry is a baby, and we are expecting it to be a varsity professor, that is not going to happen it has got to start from grade 1 and it is going to have its experiences. It is going to have its cuts and bruises and this is what we are going through now. To reach some kind of maturity and small and expanding is the answer to all of the problems and it is going to give all of the solutions in time.

The metaphor of the child and the professor brings added dimensions to the one of the pupa because here the baby must experience challenges, „cuts and bruises“, suggesting that the development of the forum should not be seen as a painless process that does not involve difficulties. This is why in all three cases the movement along the expansive learning cycle was non-linear – the realities, the resistances made it so (see Chapter 7). It would appear that most metaphors were used to conceptualise the object. „Seed“ was also used to describe the forum as the following contributions show (turns #212-#215):

#212 He says there is so much pontificating. We are not putting the seed in the ground.

#213 I was actually gonna say that in terms of this group of people getting together. You have got to say, right, I am going to phone these people to come to this forum. You need step 1...

#214 We have not seen a lot of success stories but some of the small successes I have seen is often being driven by the fact that somebody has gone to a seedling company pulled plants out of the trays put them in the plastic bags and drop them off and say if we plant them in the next 24 hours will die. Boy, three months later you have got vegetables and it comes to that ridiculous simplicity.

#215 So what seed to we want put in the ground here? I suppose that is the question.

In the seed metaphor, the notion of nurturing the forum, the activity system, is captured while at the same time, there is a hint that a seed will bear fruit some day, but not as soon as it is planted. The participant who speaks on the 214th turn seems to be using seedlings in a literal sense as well as figuratively in order to arrive at the stage of a vegetable, which can be sold. “As long as we rely on an organisation with low intent to make it succeed, we are blowing up the wrong chimney” (turn #88) was also used to mobilise participants to think hard about the shared object which would drive their activity system. In sequence #3.5 where the participant expressed the need to “funnel the drizzle” to create “a powerful stream that can flow” he

appears to be a defining relational and collective agency within a call for the marshalling of resources, intentionality towards a defined and shared object.

8.2.6 Findings and analysis on agentive talk in SCOPE

The agentive talk analysis below concentrates on the research participants' progress using the same framework employed in the Isidore case study. The intention is not to compare but to show the kind of talk that may happen at the later sessions along the expansive learning process. The analysis is based on 95 speech turns recorded (see Case Record Section 2.7).

Table 8.2: Agentive talk in the St Margaret School (SCOPE) workshop and its interpretation

Kind of agentive talk	Evidence of agentive talk in the workshop
<p>Category #1 Suggesting it is doable, optimistic talk</p>	<p>Sequence #1.1 566. Maybe the other thing for me to say I think we also need to appreciate that teachers are torch bearers, and the truth is that teachers also need leadership. If we had no school like St Margaret, would we have been able to... 567. I just want to thank you very much³¹. You see, it is like when you come to soccer. It is not the player in fact the very person who suffers the blow of failure is the player more than the supporter ... Now you see I am within [the soccer field, not the terraces]; I have become part of the project, a player. Now I am reminded, when you were asking about another device to pump water, I just want to say our partners, Environment Africa; it has a programme of taking water to schools. I think you have to ask Mr S. or else we can write an application letter asking for this thing. Now you see, I am that player now [laughter].</p> <p>Sequence #1.2 592. Yaa I just want to add something on the school practising Permaculture. I think it is going to be an easy path for us now that there is a processing centre close to the school. Our produce will find a ready market as soon as they are ready for harvesting, we can inform Environment Africa Action Group that we have such goods and we negotiate the prices before we harvest them from the fields. So marketing is going to be easy for us.</p>
<p>Category #2 Reaching mutual understanding</p>	<p>Sequence #2.1 504. When [after] the letters³² were read, it was unanimously agreed that each member who was directly linked to the water problem or electricity problem should pay an amount of US\$3 so that it would cater for [the transport costs of] the people who were chosen to go to the ZESA [national electricity authority] in Marondera [a provincial town about 100 km away] and talk to them. 519. Right, with this in mind, there was a shortage of wire the ZESA people left the place without accomplishing their task. We had to sit down again and we found out that the stakeholders were really exhausted. Nobody could fork out another US\$3 again. So it was unanimously agreed ... 520. I think you also need to highlight the fact that when you came back for more money it was not during pay days and people had no money. Right, right two school heads agreed that ...</p>

³¹ This is one of the farmers who were in the committee and his input was acknowledged but he seems to be realising that he could have played a much more central role than he did. His other point, which is the reason for classifying his contribution in this category – is that the wind-driven pump is possible to achieve.

³² Solutions were modelled in the form of letters to the responsible authorities.

	521. The two schools which had agreed that each school should, since we were the people who were benefiting from the water they should fork out US\$50 each. This was done.
Category #3 Envisioning new models, reconceptualising the object	<p>Sequence #3.1 531. From there we did not go any much further because we thought the water problem was okay [solved] but still have this thought with us that we should try and find somebody who can give us a hand in obtaining a windmill [to use wind energy to pump water].</p> <p>Sequence #3.2 575. What did you actually do to encourage cooperation among teachers? 576. I think, as I have said that when you left, we convened a meeting with teachers then we highlighted all the things we were discussing in the workshop... In fact, we were focusing on how we can improve our Permaculture here. That is when we came up with all these ideas: we need to cooperate, we need to respect each other, we need to respect the man in charge, we need to respect the teachers we are working with, we need to respect the children we are working with... some lessons we did with teachers, some sort of induction because we wanted to build a new thing.</p> <p>Sequence 3.3 584. Then on marketing we saw that some people in the community, they have got vegetables more than the demand of their families. So as Chigondo Environment Action Group³³ instead of moulding that centre as a honey processing centre, it is now a food processing centre where we are going to buy whatever is found in the community so everyone can bring produce and process those things, those perishables. When they are processed, they gain more value than if they are sold in the original form. ... 591. What kinds of foods are you processing? 592. All kinds of agro-products but we are to process these things naturally ... they will be more expensive than those processed using unnatural means. So we are going to use methods which were used by or grandparents.</p> <p>Sequence #3.4 593. Then I think it is three days ago when we had a general meeting at our centre. We discussed the issue of forming an association. So that association will lessen the burden of both transport and marketing. 594. So what exactly are the plans around the farmers' association? 595. To recruit all interested farmers, then we are going to design everything that is essential for an association, such as a Constitution, joining fees, the laws, so that when we are together our voice will become stronger. We can make an inquiry for [access]loans, buying a truck or other things such as materials and seed for improving production</p>
Category #4 Committing to action	<p>Sequence #4.1 508. With that in mind when the two heads came back, they had already exhausted the sum of money which was available when it was researched that in order to fund transport, the only amount that was required to for transport was US\$100. So when the committee was told of this problem, we went back again to the stakeholders and asked them to pay another US\$3 for every member or household and the amount which was raised amounted to US\$140 [not divisible by 3].</p>
Category #5 Awareness of critical activity systems or of structures	<p>Sequence #5.1 504. On the improvements we had to sit down with the rest of the stakeholders in Chigondo area, that is St Margaret Secondary, St Margaret Primary and all the teachers at Mutukwana and the business people, the agriculture extension officer and the District Development Fund [personnel], and clinic staff. We sat down in order to plan our way forward, that is how to implement or how to go about [addressing] the problem that we had at hand.</p> <p>Sequence #5.2</p>

³³ Established with the facilitation of Environment Africa, a national NGO operating in the area

	<p>527. After seeing that the problem was getting bigger and bigger, and worse and worse, I had to inform our MP, our Member of Parliament, Mrs Goto about our problem.</p> <p>...</p> <p>533. How did solving this problem, process make you feel? How do you feel about what you have done in addressing the water and electricity problem?</p> <p>534. At the present time, we are very, we feel great because of the achievement, what we have done because it was really a mammoth task to identify the people who should join the group, identifying the councillor as a person who is an influential member in the area.</p> <p>Sequence #5.3</p> <p>580. Because the bus that was operating in this area, Manica Bus Company, it had established a very dangerous monopoly such that they had come to the point of increasing or changing bus fares everyday depending on the number of passengers. And then marketing, it has also improved. Why? Because of the introduction of the US dollar³⁴ which has almost established a name in every household. I think it has helped improve marketing.</p>
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8.2.7 Interpretation and summative view of streams of agentive talk in St Margaret Case Study

8.2.7.1 Establishing a food processing plant and wind driven energy supply is doable

What is doable under sequence #1.1 is the securing of a wind-driven device to pump water in the school and support agricultural production (and domestic use) using sustainable energy. This doable activity is covered as a new model being envisioned under sequence #3.1, which was speech turn #531. What is doable under sequence #1.2 is the marketing of school produce to a food processing plant that belongs to a group of farmers³⁵. This would also overcome challenges associated with transport costs and low levels of local demand.

8.2.7.2 As the school in the community and the community in the school we must jointly address the water and energy problem

The main level of mutual understanding happened between the initial CL workshop (sessions 1-5) and the feedback workshop (session 6). It was mutual understanding among community members and the school to contribute time and money to address what was commonly understood as the problem of water and electricity. The following analysis shows how they encountered and overcame „resistance“.

8.2.7.3 We have a bigger vision of sustainability to work towards together

The new model being proposed under sequence #3.1 is one that would reduce their dependence on fossil fuels to pump water and produce crops in the school. Sequence #3.2 addresses the tension between teachers promoting Permaculture in the school and those that

³⁴ The local currency was out of circulation officially it was no longer worth anything even in trillions.

³⁵ The food processing plant was not yet operational but the building had been erected and most of the equipment and machinery installed. The study merely helped participants to connect with the plant more strategically as they asked their supporter, Environment Africa to convert it from a honey processing plant.

do not. It is a reflection of the structural issue of Permaculture not being in the school curriculum which competes with teachers needing address the written and official curriculum. The school appears to have reached an agreement to develop a new thing, a kind of work ethic that is enabling and supportive of one another. Sequence #3.3 shows how farmers have reconceptualised the honey processing plant into a food processing plant so that they could add value to their crops and overcome the seasonal over-supply of certain crops and fruits. The last sequence set in this category (Sequence #3.4) is concerned with the re-visioning of the Action Group as a Farmer Association with a legal persona in order to tap into opportunities that may be inaccessible in their current form.

8.2.7.4 This is what we did to address the demand and supply contradictions in the school and community

Sequence #4.1 tells how community members and schools in the community committed their resources through engaging one another. This also included the actual engagement with members of the community as well as with neighbouring schools.

8.2.7.4 We engaged local and district decision-makers in order to achieve our shared object

Sequence #5.1 shows how after the five-session CL workshop participants used the tools that they had developed (letters to responsible authorities and a committee) to engage with local leaders; local civil servants from local government, and health³⁶; and the business community. This suggested that they were aware of the power of these groups of people and what they represented. Sequence #5.2 shows how the engagement with those with political power was scaled up to district level and engaging a Member of Parliament. Sequence #5.3 shows how farmers appreciated the national economic system and how this impacted on their local activities in an enabling manner. It also shows how they successfully engaged with transporters of their produce.

From the above table, it is possible to see that a lot of agentive talk and real action took place after the five-session CL workshop and, it is therefore possible to conclude that it was a useful mechanism for mobilising and inspiring research participants to improve their situation from it. But was there any learning? The re-conceptualisation of the object of the activity system discussed under category 3 shows that there was indeed some learning.

8.2.7.6 Use of metaphor

Research participants in Case Study 1 also used metaphors.

³⁶ The agriculture extension officer took part in the CL workshop and was part of the committee.

#519 Right, with this in mind, there was a shortage of wire the ZESA people left the place without accomplishing their task. We had to sit down again and we found out that the stakeholders were really exhausted.

#5.5.6 Maybe the other thing for me to say I think we also need to appreciate that teachers are torch bearers, and the truth is that teachers also need leadership...

#5.5.7 I just want to thank you very much. You see, it is like when you come to soccer. It is not the player in fact the very person who suffers the blow of failure is the player more than the supporter he suffers more than the supporter. Now, you see I am within [the soccer field, not the terraces], as he is saying now that I have become part of the project, a player.

#5.9.2 Yaa [Yes] I just want to add something on the school practising Permaculture. I think it is going to be an easy path for us now that there is a processing centre close to the school. Our produce will find a ready market as soon as they are ready for harvesting.

The metaphor of sitting down was repeatedly used in the feedback workshop to indicate reflecting and planning together. The metaphor of teachers as torch bearers appears to have been used to show that there were areas in which they provided leadership by showing the way. This was especially the case because they coordinated the engagement of the school heads, the Member of Parliament and ZESA. The metaphor of players in soccer and supporters was used to show the difference between subjects in an activity system and the community that they serve. But more importantly the farmer in question used it to illustrate how he was to become a more active member of the networked activity system. The path was used to refer to the doability of marketing school produce because the tool to mediate the exchange of school produce as a product had been developed.

8.2.8 Findings and analysis on agentive talk in MFS Case Study

The analysis of MFS agentive talk in a CL feedback workshop is based on 101 turns of talk (see Case Record Section 4.7.1).

Table 8.3: Agentive talk in the MFS Feedback workshop

Nature of agentive talk	Evidence of agentive talk in the MFS feedback workshop
<p>Category #1 Suggesting it is doable, optimistic talk</p>	<p>Sequence #1.1 812: So when you say the government who exactly do you write to? 813: District Agriculture and Extension Office. 814: OK, have you been to see her in person? 814: No. 815: And are you planning to do that? 816: We are planning to visit her so that we can have a discussion.</p> <p>Sequence #1.2 866: So through having that demonstration we will be able to document the evidence of how the system works, so that we can have something documented. Because we know the system works, but there is nowhere you can find a written document saying this is how it works. So we are aiming to get to that point. We have got good relations with the Ministry. Also from that demonstration we will be able to raise awareness like we are doing among the councillors. Because whatever the plans come from the council, they are to take up to district of which every sector, of every department is expected to fulfil, or to support those plans, which are coming from the grassroots. So if we create awareness among the grassroots, among the people who are making plans, we will be able to have</p>

	<p>our MFS into their plans, of which the Ministry will be bound to support. So that is the angle we are taking.</p> <p>Sequence #1.3 895: I think I support the last idea [recommendation], the fourth one especially when it comes to establishing the programmes. But like here in Lesotho, you find most of our organisations are working on projects. And when the project goes, then everything goes. But the programme, if we manage to have programme it will be easier for us to have long term thing, of which we work on... So, if I think, if it is expanded into a programme then even the five year training programme for MFS farmers, we will be able to achieve that. Because once the farmer goes beyond five years, he will be able to sustain itself in terms of implementing the system.</p>
Category #2 Reaching mutual understanding	<p>Sequence #2.1 887: [after the presentation or recommendations] Ntate is just saying he realises that you came with good recommendations, especially on stigmatisation of MFS especially within the government. If that could be addressed, then things will be right.</p>
Category #3 Envisioning new models/ reconceptualising the object	<p>Sequence #3.1 889: Me³⁷ is saying it has been a request from farmers that RSDA and MADF should work together. But it doesn't seem so. And she is saying if the top officers are not working together even if we want to collaborate, it would be difficult because the top officials are not taking that into consideration.</p>
Category 4 Commitment to action	<p>Sequence #4.1 864. ...There has been an initiative on the establishment of good relations with the Ministry of Agriculture and Food Security (MAFS) through the office of the District Agriculture Office (DAO). Out of this initiative we established a demonstration plot for documenting MFS as good practice. Can I elaborate? 865: On the progress made? 866: Yeah, about the progress. Actually like I have indicated that we have established good relationship with the DAO, in that the DAO's office is supporting us on the establishment of the demonstration, of which they are giving us seed. They are giving money for ploughing, even for weeding; all the moneys that are needed are from the office of the DAO. Our aspect is to, just technical knowledge of the systems. So through having that demonstration we will be able to document the evidence of how the system works, so that we can have something documented. Because we know the system works, but there is nowhere you can find a written document saying this is how it works. So we are aiming to get to that point.</p>
Category 5 Awareness of critical activity systems	<p>Sequence #5.1 817: OK. And when you went to report to the group, what, did you hold a meeting? How did you report the workshop, and what was the response of the other farmers back home in your group? 818: It was sort of a farmers' meeting. It didn't involve the Chief. We only involved the MFS farmers.</p> <p>Sequence #5.2 835: Ok. Thanks Me'. There was an issue about seed security, the seed policy not being supportive of farmers, and there were promises that something was going to be done about it. Did you do anything about it? 836: Yeah, I will answer that from my perspective. The seed policy, it, there was a meeting where it was discussed, but it was discussed in a way that it should be improved before it can be taken to the parliament for approval. 837: Who attended the meeting, and who convened it? 838: There were some representatives from farmers, representatives from NGOs, the Ministry of Agriculture and other ministries. 839: Who invited people to attend? 840: Actually, it was in the hands of the Department of Research, through the support from FAO. So FAO is interested in the seed policy. So the policy document has been compiled, has been discussed and some recommendations made. So it will be tabled in</p>

³⁷ Me' is the local word for madam which is used to show respect to women.

	parliament. ... 867: Have you had any awareness raising meetings with councillors or is that something you are planning to do? 868: Actually, we haven't called the meeting as such, but in whatever operation that's been done in demonstration, the councillors and the chiefs are taking part. So, even some farmer representatives are taking part.
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8.2.8.1 Collaboration between Ministry of Agriculture, MFS farmers and NGOs is doable

Sequence #1.1 suggests that it is possible and desirable for farmers to engage directly with Ministry of Agriculture officials in the district in order to stimulate support for MFS. The next sequence (#1.2) indicates that once that collaboration is obtained many other things become doable in the promotion of MFS practice. These include showing decision-makers and other farmers the potential of MFS so that they may accept it and possibly adopt it. Sequence # 1.3 suggests that a programme approach to the learning and practice of MFS is both desirable and doable.

8.2.8.1 We are in agreement that the stigmatisation of MFS undermines its growth

Sequence #2.1 points out that research participants who attended the feedback workshop were in agreement with the finding that the stigmatisation of MFS in the country had undermined its potential for growth and had to be tackled especially through engaging government, which had taken part in its stigmatisation.

8.2.8.3 Our shared object will succeed only if top officers in MFS organisations collaborate

Sequence #3.1 underscores the value of buy-in by the leaders of the organisations that are promoting MFS, especially in terms of planning things together, working together and reflecting together, which has not been the case. Therefore the new model of operation must include synergy throughout the concerned organisations, not just parts of it.

8.2.8.4 We will contribute our expertise to make the demonstrate plot serve its purpose

Sequence #4.1 indicates that MFS facilitators are prepared to play ball and ensure that the MFS demonstration plot which has been assigned to them by the Ministry of Agriculture in the district works well and serves its purpose adequately. Other commitments being made here include researching and documentation of the practice for the benefit of others.

8.2.8.5 We are aware of the political structures and their power

While Sequence # 5.1 shows how aware the farmers and facilitators are of the power of the traditional leaders such as chiefs, Sequence #5.2 shows that they are also aware of the power of national government and intergovernmental organisations such as FAO. In addition, they seem to recognise the potential power that civil society through farmers' organisations and NGOs have.

8.2.9 Discussion on using agentic talk for analysis

Analysis of agentic talk in the three case studies under investigation has provided in-depth insight into the manner in which participants got themselves ready to act on the primary contradiction that was identified in their activity system through earlier consultative research, presented as mirror data in the developmental work research process. In the process of conducting the analysis, a number of interesting learning and agency dimensions were identified through use of the five categories of analysis, or units of agentic talk. Significant in these are: the manner in which participants crossed boundaries in their speech acts; and how they prepared themselves to cross boundaries that were constrained by power relations through recourse to collective agency strategies; how they moved between the past, present and the future, as should happen in a CL workshop; and how metaphor was used as a strategy for meaning-making, used to persuade each other to act. Using this framework for analysing agentic talk in CL workshops appears to provide a useful means of developing a more in-depth understanding of the agential decision-making process in cultural historical activity systems oriented towards change oriented learning and sustainability practices. The analysis of agentic talk showed how language:

- a. Was used in speech acts to communicate and therefore externalise the private thoughts of participants on the subject under discussion, perhaps making the „internal conversations“ or „reflexive deliberations“ referred to in Margaret Archer’s (2003) research on agential processes, more accessible and visible in learning and change processes;
- b. Carried the multiple perspectives and distributed knowledge in the group, thus allowing participants to see part of each others“ worlds, giving deeper insights into Engeström’s notion of activity systems being „multi-voiced“ (Engeström, 2005);
- c. Was used to expand the current horizons of the practice of organic farming within the broader framework of sustainable agriculture, showing the potential of examining agentic talk in change oriented learning processes and sustainability practices;
- d. Was used to jointly construct something new including the shared object and how to jointly work towards a new and more advanced activity system. This constitutes the development of new horizons and therefore the definition of a jointly constructed zone of proximal development, and the possibilities of understanding collective agentic talk as being significant in jointly constructed zones of proximal development;
- e. Was used to motivate each other and use collective agency for engaging with complex power relations between the primary activity system and other activity systems

(e.g. organic farming communities and government agriculture systems), helping participants to „get ready“ for a long journey along the expansive learning cycle; and

- f. Was used in agentive talk to render the object of the activity system dynamic and open to change and transformation.

Some of the challenges that have emerged in micro-analysis of social change processes working with agentive talk, is to assess disposition to act embedded in body talk or body language (i.e. aspects of embodiment). Complementing the language-based analysis with descriptive video data or annotated photographic images may therefore provide further insights into embodied aspects of agentive talk. Another challenge is how to interpret statements that have potentially more than one meaning as turn #321 seems to indicate: “My analogy is that we’ve got a baby, an orphan that needs to be a graduate the organic industry. It’s a baby - its goanna make mistakes. If you are small, early on the mistakes aren’t really hectic”. The use of the word baby twice in the statement and reference to the word orphan at once seems to suggest hope on one hand; seclusion, aloneness and feeling neglected on the other hand. A third challenge lies in the level of detail of analysis of individual talk sequences vs group talk sequences. As mentioned above, this level of detail was not worked with in this agentive talk analysis, although the facilitators’ interventions were identified, and in a few sequences reported above, were significant in mediating the expansive learning process. While significant, such challenges do not diminish the value of using agentive talk to identify agentive decision-making processes in change oriented learning settings, and remain openings for further, more detailed research in this area (see Section 10.3.1). The discussion has also highlighted that in foregrounding those words that are spoken, we fail to fully see the significance that forgetting a word can make the difference between learning and not learning; getting ready for action or inaction; sharing and not sharing. As Vygotsky (cited in Sannino 2008, p. 238) states, “I forgot the word which I wanted to say, and the thought, lacking material form, will return to the chamber of shadows.”

8.3 REFLECTIVE TALK

8.3.1 Theoretical roots

My interest here is to discuss and reveal other places where evidence is given that there were, indeed, other forms of learning. I find this in how participants reflected on their experiences and call this talk *reflective talk*, by which I mean a talk that shows that something has been learnt from practice and is going to be used in future to improve the practice or enhance individual or collective agency. I drew the notion of reflective talk from CHAT as well as from action research, which is another kind of research with an interventionist orientation, seeking to build both the agency and reflexive capacity of research participants. Action research underscores the need for planning before acting and of reflecting after acting in

order to draw out lessons from doing. Engeström (1995a) tells us that the expansive learning process happens in three contexts: criticism; modelling and application. He defines the context of discovery as consisting of powers of experimenting, modelling, symbolizing and generalizing (see Section 3.6.5). Discussing expansive learning, Jarvinen and Poihela (2001, in Brall, 2007, p. 90) noted “In our view, the key to understanding learning at work lies in the relationship between the concepts of reflection and context. Reflective learning does not involve just learning of existing matters and activities; it also involves the production of new knowledge.” Reflective talk can be seen as a form of learning that will later enable better levels and kinds of agency in working on the context. It is a critical component of reflexivity – a concept that runs through the study (see Section 1.6.1). Brall (2007) further noted that in an expansive learning cycle, there is a double cycle of action and reflection. The starting point is the experience, followed by reflection and then a model (see Section 3.6.5, Figure 3.6, the first three stages). This is the first layer of the double cycle action and reflection in expansive learning. The second layer is the action of implementing the model, followed by reflecting on it; and developing a general model (see Section 3.6.5, Figure 3.6, stages 5, 6 and 7) (Brall, 2007, p. 92). The reflective talk that I am primarily interested in is located in the second layer, which is based on thinking about the model solution, how it was implemented and what was learnt from modelling, remodelling and implementation.

8.3.2 Evidence of reflective talk in the three case studies

Reflective talk analysis in this chapter is based on feedback meetings and workshops held after the CL workshops and the modelling of solutions in each case study. So the reflective aspects being sought are concerned with the research journey from stage three of the expansive learning process onwards. In Case Study 1, this means drawing on 95 turns of speech during a SCOPE-St Margaret School feedback workshop held in September 2009 and whose numbering ranges from 501-597. In Case Study 2, it means drawing on three feedback interviews (Feedback Interview #1-3), while in Case Study 3 reflective talk analysis is based on a feedback workshop with 101 turns ranging from #800 to #901, as well as on Feedback Interview #L1. The evidence presented is not intended to be exhaustive but rather to illustrate the existence of reflective talk in those interactions during the research.

8.3.2.1 Reflective talk in Case Study 1

a. Joint thinking and action, which is an important feature of expansive learning

#547I just want to comment on the importance of working together... it is more of sustainable development. It was more of a partnership ... each member working on his needs, or his opinion. So I think if anyone can focus on the importance of working as a team...

548. Okay to add to what Mr B is saying, there is need for oneness between the community and teachers because if you look at this water problem, it was also come as a relief to local people because now they are coming here to fetch water.

...

#551 As for me I have learnt that if you see there is any problem, to solve the problem, it needs people who are involved, to take part in solving the problem. They have to be consulted for ideas to solve the problem and also even to make contributions. Before contributions, people, it must be clear to them what caused the problem, and what the effects of the problems are such that when you come to contributions, people are willing to put hands into their pockets for contributions.

The discussion above shows how the participants realised the value of collective and relational agency which enabled them to address a problem they would not have been able to address without coming together.

b. Good citizens exercise responsibility

#552 The other thing also is that we just need to be responsible citizens, by this I mean, we must not destroy things at random, just because it doesn't belong to me, because if we go back to the root of the problem, it was a question of irresponsibility of us citizens. We just need to be responsible with things that we have. I think this is one of the most important lessons from this problem.

#559 I just want to add a little about what has been said about the teacher. The role of the teacher is not just enabling the child to know one plus one and how to write but you also have to teach the whole concept of life. So it was your responsibility.

...

#563 We want you [pupils] to grow up responsible people. Do not break window panes in the school just because you have completed Grade 7, because you are done with this place. Because tomorrow or in 10 years' time, what will your child use? Those same materials that you destroyed when you completed Grade 7. I want you to carry this in your lives pupils, wherever you are, be it at home or in the community, look after resources.

The notion of responsibility is interesting here in many senses. To begin with, during the five-session CL workshop, participants attributed the problem to community ignorance, now they are re-conceptualising the cause as irresponsibility. Second, a farmer, who is also a parent, applies the concept of responsibility to the teachers themselves describing them as „torch bearers“. In the last turn in this reflective talk, the teacher turns to the children and explains to them what it means to be a responsible citizen using a number of words in the vernacular to ensure that they understand.

c. The research process made it clear that knowledge is power

#554 One lesson I have learnt from this is that knowledge is power. Without knowledge, we cannot go anywhere... I just want to thank you for the programme you did with us because it is really an eye opener to us... So with the knowledge that you gave us, we gave this knowledge to stakeholders who really appreciated it. We utilised it. We conquered it because of the knowledge that we have.

The concept of knowledge is power is commonplace but here the participants are referring to a methodology that allowed them to realise their hidden potential. The research programme is being credited for activating the agency that lay „dormant“ in them.

d. It is important to be part of the solution

#557 I just want to thank you very much. You see, it is like when you come to soccer. It is not the player in fact the very person who suffers the blow of failure is the player more than the supporter ... Now you see I am within [the soccer field, not the terraces]; I have become part of the project, a player. Now you see I am that player now. [Laughter]

Here an individual participant has assessed his contributions in the past in connection with the study and feels that he has not given as much as he should. He is therefore contemplating escalating the level of his input by moving from the terraces onto the field to be a player.

8.3.2.2 Evidence of reflective talk from Case Study 2

a. The forum needed an identity

Researcher: *So the brand name that you are talking about is in connection with that forum? Is that correct?*

EM: *I don't know if I can bring it to that.*

BM: *Basically it is that. That is the case, that we recognised that we needed a forum and we were doing further research [since the workshop] about how we were going to structure that forum. We identified the Participatory Guarantee System.*

EM: *We decided that we needed a brand name because this was so fascinating to me. So I thought „Wow, Eureka, we need a brand name.*

Researcher: *And what did you need it for?*

EM: *We needed it for providing a vehicle for the producer and the grower to be able to market his things profitably in the retail and wholesale sector and the only way he was going to be able to access that market was if he had a name that the consumer would identify with, what it stood for.*

Researcher: *Okay, what else did you do after identifying the need for this?*

EM: *What I did is after identifying the need for this is giving it its own identity based on a framework of the Participatory Guarantee System... It has so many more possibilities of socio-economically benefiting the small grower. (Feedback interview # SA1)*

The conversation above shows how research participants reflected on their model and felt the need to improve it to address some of the marketing and economic demands while at the same time addressing the socio-economic needs of smallholder farmers who have been marginalised by mainstream organic farming certification processes.

b. Representation of different stakeholder groups should not have been taken for granted

BM: And I am very glad that you have come back now at this point to pose these things. There is one thing that struck me on this business above everything else is that because I selected members from the forum, together with EM and discussions with other people as to see, basically disseminated what needs to happen, what its functions is and who is gonna be the best person to perform each function. And I came up with a group of people within my

resources. But since Mutizwa has arrived it has been very clear to me it is not a very balanced group. Like we are not from an ethnic point of view, I have got one Mr Nkosi who is going to be working with us, and the rest of us are all white. Now I didn't think it that it would be an issue because I don't think along lines of colour.

Researcher: I haven't said anything about.

BM: No, no, but this is something that I am ...

RZ: But you know this is something that we said when [we developed guidelines for the forum]

BM: ... I think, I mean, try now but it was a big learning curve for me to realise that there has got to be people representing different communities in this forum. (Feedback Interview #SA2)

The above discussion shows how a research participant realised that some of his decisions may have negatively impacted on the development of an organic forum and movement which they set out to do at the CL workshop. He also shows his intention to correct the situation suggesting that he was going to use the lesson he had learnt.

c. The responsibility for setting up the forum needs to be spread for sustainability

BM: One of the things that EM said to me at the beginning of this week is that she has had enough. She is burnt out. She doesn't want to know about it. And one of the things about this visit is that I am re-inspired. I see where I can play a part in it and there are a few things that I need to do. So EM can take a bit of rest.

RZ: It is a relay, it is relay. [Laughter]

BM: Okay.

RZ: Hand me that stick [sound more like the leadership, the opportunity] and I just go and be just be there and see if there is something I can pick up. (Feedback Interview SA#2)

The point that relational agency is about give and take (and not just giving) is well illustrated here through the „burn out“ experienced by the one who tried to do almost everything while there were other research participants who were denied the opportunity to give and get. The metaphor of a stick in a relay could be interpreted to mean the need to share, not only responsibility but also power, which is consistent with the notion of networked activity systems which do not have a fixed centre.

8.3.2.3 Evidence of reflective talk in Case Study 3

a. The increased availability of open pollinated seed means we must train farmers to multiply seed

#856: It is helping them to get seed, but it is not building their ability to produce seed for themselves?

#857: Actually, it is kind of an emergency. It relieves you while you are still preparing for the mid-term because at the moment it has an emergency component to relieve you from the hunger while still preparing you to engage in the long term.

#858: OK. That's good.

#859: Especially because the seed that is recommended in those seed fares are open pollinated varieties.

#860: OK, that is good?

#861: *Our intervention in this regard could be to train them on how to select seeds from their harvest so that they can be able to multiply.*

The above discussion, which started off by appreciating the increased availability of open pollinated seed varieties resulted in an MFS facilitator realising that a new niche had to be filled in order to build the seed security of the farmers. This would be achieved through making it easier for them to multiply good quality seed.

b. We need to make time to meet and plan together with or without money

Researcher: *Now as the two main organisations promoting MFS, yourselves and RSDA, are there specific things that you can do together in this direction?*

MT: *Working on the messages so that we know that for facilitators this is the tool kit that can be used to train them and they can take it away...*

Researcher: *Thank you, anything else?*

MT: *I think part of the reason why we have not been talking to each other is that we have not had funding for networking activities for a very long time.*

Researcher: *Do you need a lot of money to meet like this and plan together?*

MT: *No we get busy with other things and targets.*

Researcher: *Okay. I understand in the past you used to share staff, for example staff from here going to help RSDA in training farmers and vice versa. But that appears to have stopped.*

MT: *They trained our staff and farmers before MADF office was set up. Unfortunately when the office was set up, they were some problems. I think it is us who started not talking to you and getting busy with other things.*

SR: *I agree with you Mutizwa that it is not necessarily a question of money. We should meet and discuss. I remember in the morning when we were talking about a new way of building compost. They did not know about it and we are already selling it, it is not good.*

Researcher: *Yes, it is not good. It is not good.*

MT: *Because of our dairy demonstrations we have so much manure that we cannot even dispose.*

SR: *Yet we really need it. (Feedback Interview #L1)*

Near the beginning of the conversation, there were attempts to justify the lack of coordination of efforts that existed between the two „top officers“ as one research participant put it during a feedback workshop, but as the conversation progressed both leaders decided that they could in fact do a lot more together without necessarily using significant additional resources.

8.3.3 Use of metaphors in reflective talk

8.3.3.1 Examples from Case Study 1

I have previously discussed the metaphor of soccer and its possible complexities (see Section 8.2.7.6). I have also discussed the metaphor of the eye and the opening of it (see Section 8.2.7.6), to help the eye owners to see – not to give them eyes. The other metaphor that was used in connection with the past and the future was „sitting down“, which is Shona language denotes a reflective poster that come with group deliberations linked to the notions of *dare* –

a place where cases are heard, discussed and decided upon. It was used five times in the 95 turns and it was used to denote moments of collective reflection; discussion and reaching mutual understanding. In a sense therefore, participants „sat down“ among themselves and with stakeholders so that when they stood up to walk or run again, there was a clear purpose and direction – that is change oriented learning, change in themselves and change resulting from working on their context.

8.3.3.2 Examples from Case Study 2

The metaphor of relay (see Section 8.3.2.2c) in athletics was used to show the necessity for cooperation and coordination in the development of the newly developed model of a Green Growers Association. It was also used to underscore the need for inclusion of the different actors in the forum. The metaphor of the stick, which is also used in relay, was used to suggest that it was necessary to give one another a chance to exercise relational agency, to lead and co-construct the implementation and review of the solution.

RZ: This is why I said if we know that their information is flawed then we tell them that you are looking at the wrong page or you are not looking at the page at all. (Feedback Interview #SA2)

The above statement was made with reference to engaging the local government in matters of organic agriculture, the point emphasized being that of linking up with them constructively. The comment is consistent with the idea of bringing different voices, perspectives and minds in a networked activity system towards a shared object.

BM: It is at this point that EM hit a wall, putting a lot of energy into getting frustrated that is not coming right and suddenly realising it, okay patience and allow it to happen and Mutizwa you have been doing this for a long time now. And I mean you made the comment of how much, how far we have got already because you are looking at from an objective point of view. You have seen things build up. You know the dynamics when you are working with groups of people and communities and producers and things like that. It doesn't happen like that. When you work with individuals" things can happen like that. When you work with family, things can happen light that but as soon as you develop that social structure, it becomes a lot more complex and rushing it can easily become the death of it. (Feedback Interview #SA2)

The image of hitting against a wall illustrates how in an expansive learning process, actors are likely to encounter resistance, which explains why the path is non-linear. The lesson being drawn from this is that there are likely to be many unexpected turns of events especially when matters being dealt with are more complex and involve more people or groups of people. This has implications for DWR and for engaging in expansive learning processes, that is, they should allow for and anticipate non-linear change processes that require ongoing reflexivity.

8.3.3.3 Examples of metaphors in Case Study 3

There were two metaphors that were used in Lesotho during the feedback workshop. One was concerned with eye-opening and the other was a gulley (*donga*) as the two conversations below show:

89I: Me'' is actually emphasizing on the importance of collaboration between the two top officers. She has realised that the gap was small at the beginning but as time went by she realised that there's a gap that is between the two officers was growing, until now that there is a huge gap, of which she doesn't even know how to close that gap. It seems there's a donga in between the two offices, which needs to be closed so that we can improve the MFS.

SR: Your research has opened our eyes into some things we were not aware of. As far as the facilitators are concerned, the level of understanding of the MFS is not the same, yet they go to tell the farmers about the MFS. (Feedback Interview L#1)

The metaphor of opening the eye was also used in Case Study 1 and suggests enabling processes to happen and is linked to the building of collective and relational agency. The metaphor of *donga* was used to illustrate distance and the amount of effort that was needed to reconnect between the two organisations. Essentially it was concerned with the need for bridge building between MFS-promoting organisations as part of building the new solution. The realisation is that „we are our own enemies“; it is not just government and the corporate sectors standing in our way.

8.3.4 Discussion of reflective talk

From the analysis of reflective talk in Sections 8.3.2 and 8.3.3 above, the following conclusions can be drawn:

- Working jointly to take responsible action is empowering and enabling. This is why, for example, the stick must be passed on to others. And when those with whom one works are not reading from the same page, engagement, rather than leaving them alone, is imperative.
- The role of the teacher is not only to deliver the written curriculum but also to work with co-learners to make decisions for living responsibly, a notion closely associated with Sen's idea of capability (see Section 3.6.6) with an ethical dimension. In addition, their interventions made them realise the value of good citizenship (*ubuntu*), which is what the discourse on African renaissance is built on (see Section 2.7). It is also consistent with the notion of good citizenship that social learning processes seek to engender (see Section 2.5.5.3).
- Participants have capabilities in themselves (eyes to see) and all they needed was some programme to „open their eyes“, which in critical realist terms translates to the CL workshop having been the event that activated the participants' latent thinking and

action powers. However, as Dean (2006) pointed out, the potentiality of people cannot simply be turned on but needs to be cultivated. The CL workshops and resultant co-engagements among research participants created moments for „opening the eyes“ for cultivation of potential, to allow potential to flower, produce seeds and nourish the community.

- Agency will best be realised when actors „play ball“, and do not spend most of the time watching from the terraces and supporting from a distance – in other words, not being involved in the whole act of „giving and taking“ which is concerned with relational agency as Edwards (2007) noted. They ought to take part in the relay race or in building bridges across dongas.

From the above analyses, it is possible to conclude that the feedback workshops and interviews also served as a space for winnowing out fruitful experiences and sowing them back into the group to be nurtured by and to nurture participants. This shows the value of periodic contacts with research participants in the expansive learning workshops, beyond the initial CL workshops. Adding the reflective talk analysis to the micro-analysis of agentic talk can help reveal the reflexivity that goes on the expansive learning processes and provides definition to theories of social learning (see Section 2.6). Analysis of reflective talk generally appeared to be a straightforward process of seeking out what insights were emerging either from the research participants, what evidence suggested reflexivity.

8.4 LEARNING TRAJECTORIES IN CL WORKSHOPS

The idea of a learning trajectory is concerned with looking at the pathway that a learning process is going through. Engaging in the process of such an analysis can help one see how participants in a CL workshop cross boundaries and form concepts collectively. In this study two detailed analyses of learning trajectories are provided: how participants negotiated and came to agree on what sustainable agriculture cognition is; and how they also defined their relationship with government. Both examples are drawn from Case Study 2 where a long process was engaged in to arrive at some common understanding. This is included because this study also has special interest in what constitutes sustainable agriculture cognition since it is interested in cognitive justice as discussed in Chapter 2.

8.4.1 Expanding conceptualisation of agricultural cognition in the Isidore CL workshop

The table below shows the sequence and therefore trajectory of the discussion that led to a (re)conceptualisation of agricultural cognition in a CL workshop held in Durban, South Africa.

Table 8.4: Learning pathways on organic farming cognition

Learning path	Evidence from data (number denotes speech turn)
1. Organic farming knowledge would be more complete when lay knowledge and traditional knowledge is tapped into	<p>54. I think this is the starting point as far as fragmentation and the linkage problem as far as organic is concerned is that it has lost its original purpose of creating unity and bringing back the lay knowledge and bringing back old principles we started [that] with.</p> <p>142. I think another linkage that is missing is between the people that have the cultural information and the people that do not have the information in other words, the young people and those specifically over fifty who live in rural areas and remember how the old ways were practised successfully and the people of this generation who have not been exposed to organic farming or sustainable agriculture... So I think the link that is needed is between those that have experience and those that haven't. It is important to look at as well.</p>
2. Organic farming knowledge comes from trainers to farmers and includes quality control	<p>177. And I think that will be like a place for exchanging products and bringing them with the people that do the training would step in. They could carry on mentoring the farmers to see that they are still sticking to the organic roots and not become corrupted by any other influences and if such happens...</p>
3. There is need to incorporate conventional farming knowledge in organic farming	<p>276. We are thinking of bringing in a training entity. Just refer to it how we develop our knowledge and the agricultural side so to have someone who has got that other training, you know conventional training.</p>
4. Organic farming knowledge should also influence conventional farming knowledge and practice	<p>279. What I suspect, if we have to invite conventional famers is that they would learn a hell lot from us.</p> <p>280. I think it would be a two-way learning process.</p> <p>281. Yes, I do I think in a way that they are so established in the commercial line, income-driven.</p> <p>282. Then it is bottom line income driven. From a body like me it would be interesting to see how they manage that land in order to take formula that is a quantum leap. And that would translate into our situation knowing what I know.</p>
5. Organic farming knowledge should have a future orientation	<p>289. So I think it's very important that if you goanna look at growth. It goes like hand in hand, you're growing agrarian consciousness, you are growing people and families, you are growing communities, you are growing independence. There are things that are not dependent each other.</p>
6. Organic farming needs expert input, "sacred and explicit" knowledge as well	<p>297. We have a lot of trainers but they are very few mentors... These people that are coming now are mentors, the mentors are the ones that are responsible for the follow-up support of the farmers. They've got a centre within the community. She's a virus scientist [plant pathologist]; whatever she describes herself that has got a central office within the community. So is there fixed in a place where people can phone. You can drop in and say I've got these problems with insects I don't know what to do about it.</p>
7. Organic farming knowledge should draw on the practical and tacit knowledge in the industry by learning from how other sectors are doing it (health)	<p>300. Maybe one can setup in a forum like the doctors obliged to work in a community hospital maybe within a forum all the people need to committee to doing the certain amount of community work that is unpaid whatever that is a supportive thing so you would invite me a retailer to speak in the training... So that way we would get the people that are successful in whatever area they're in to do specified sections of the training programme and therefore support those trainers.</p>
8. Organic farming should draw on local cultural knowledge	<p>339. We have to develop and incorporate the lay knowledge of the existing cultural knowledge that we need to draw on to relate the market,</p>

	the producers okay.
9. Organic farming knowledge should incorporate the business dimension	346. The trainers also need to be market related. That is why the retailers should be involved in a forum to actually get feedback from both [sides], not so much one way stream of information flow – from trainer to producer and retailer but also a return stream from producer and retailer back to the trainer. This way, the training can become more market driven.
10. Lay knowledge from the ordinary farmers should constitute part of organic farming knowledge	350. The trainers need to be involved in the forum to realise that part of their processes need to incorporate lay knowledge from the producer. So as a trainer ... your introduction day or part of your integral process should identifying an examining of the resources of your target training group before you starting spouting all your wisdom or your knowledge ...
11. Organic agriculture cognition is not bottom-up or top-down, but both	353. They don't want to put themselves in a position where they can say something that embarrasses them and the richness of that interaction is lost. 354. One is a top-down approach, the other one is bottom-up. 355. Well, it has to come from both sides. 356. You have to be sensitive and humble enough not to think that you are the repository of all knowledge. 357. This is why we are setting up this forum; it is to be more sensitive. This forum is not so much to me, is not so much about yet another source of information. It is to encourage sharing.

The learning trajectory around the concept of sustainable agriculture cognition showed how participants moved from seeing organic farming knowledge as located in the organic farming trainers to cognition that is a meeting place for different knowledge systems and sources. These include traditional knowledge and local knowledge, as well as scientific knowledge; explicit and tacit knowledge; theoretical and practical knowledge. The learning trajectory also moved from treating organic farming knowledge as a production-focused knowledge to one that had an economic dimension. The sources of knowledge included farmers, scientists, organic farming promoters, conventional agriculture extension workers, and entrepreneurs, a perspective that is consistent with post-normal science and cognitive justice discussed in Chapter 2.

Table 8.5: Learning pathway in relation to government involvement in the organic sector

Learning path	Evidence from data
1. Leave out provincial government because they undermine organic farming and support conventional agriculture.	55. If you talk to provincial department of agriculture, they hand out chemical fertilizers and seed bags and terminator seeds. They have kind of completely different mindset. So, depending on where you go, and if you go to provincial government, then the organics will fail because of the attitude of the regional department. If you focus on Durban, I think you see it succeeding in the next couple of years because the guys there have really woken up to what it is all about. 64. We could actually work with those without pre-formed ideas as to why it is not working and really break the path because I found that organisations tend to defend the position that exists. Therefore, they

	offer a lot of resistance to new ideas. So that was part of my agenda as well with regards to government representation.
2. Bring provincial government in, at least at some stage.	65. I think definitely the next stage will be to involve them [government].
3. Government should be invited as funders	85. So it can get government sponsorship and international sponsorship because it is up there and what Noah's Ark does it has its 10 farms in Durban.
4. Government cannot be trusted but can still be a good source of support for emerging farmers	86. Basically what happened is that the provincial department of agriculture and economic development funded a two-day workshop in the Valley of a Thousand Hills and the whole organic sector was there. We got terribly excited and we dashed off. We drew up a proposal for how we could set up this Noah's Ark similar-type entity and it was not a lot of money... The proposal got tossed around a bit and we actually realised what happened was that the provincial departments were not interested in organics...They throw another bone. So the lesson learnt from this is let's not rely on government ... In fact you only pull in government to say these are emerging farmers so they need your help with funds in irrigation and let them do what they do best. Government is useless at actually organising commercial entities like this. 93. And BZ has done a hell lot of work in putting proposals together working formulas working proposals. There is no political intent, because if there is no political intent it does not go anywhere, it stops literally, like we said, at throwing a bone at the organic industry to act like they are interested.
5. Government likes to be associated with success and will join us later	93. Government will climb on board when the organic sector makes itself work, and then government will have an interest.
6. But government has a reason to work with the movement now	I think that is the point that I wanted is the well-being there [referring to the overall vision on the flipchart paper], they want them uplifted. The government has a reason to be working with the movement like organic farming.
7. If we can, obtaining government support has great potential to transform the industry	99. Four to five years ago South Africa was where it happened because we still have all the resources. But agriculture is the only economic sector that is going backwards. Why? Because we are not putting money in it. The organics movement in places like Tanzania, Rwanda, Uganda, Kenya and the even the DRC was unheard of. You look at it now the richest country in the world has got the highest number of certified organic farmers. ...South Africa is left behind. 100. Yes they have come from nowhere and just a little bit of government intervention in fact we have groups of farmers there who are suing some conventional farmers for spraying DDT, because they are organised.
8. But government cannot be trusted because it has vested interests in high external input agriculture	165. Do you know what the system collapsed? It was running so well and all it needed [to collapse] was some government entity Biotechnology Unit, a spin-off from a parastatal. They came there and they said we can give your cooperative some funding. We tried to prepare this people and tell that these guys are GMO people.
9. The government should be approached when we have a working model.	252. So to sum that up as a forum we need to develop prototype that is not funder orientated. 253. Yes we need it and then to go to the government and then what I gather is there's a lot of money floating around that is totally without orientation that's gonna go where the obvious place go. So now if you in this forum, if you created a modus operandi that is efficient this whole thing ... if one then approached the government and said right this is working like this an initiative we've done it they are working.
10. Engage with government as stakeholders in the outer circle	315. So along the chain then we also looked at local government. So when you came, arrived, we were talking about some of the reason why this should be part of forum. Then as we were talking there were also

	<p>other actors that came in both government and donors who shouldn't form part of the core forum but they should be related with it. So in short we have a group of farmers, retailers and mentors and local government that would be related to government and workers those that are promoting conventional for eventual agricultures, agro-processors and to providers. Maybe providers, is too limited [a term].</p>
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One of the strategies that I used in running the workshop under investigation here was to find a way of presenting the absent, that is, making the absent that matters or who matters present, as Bhaskar's critical realism recommends. Provincial and national government was not represented at the workshop but considerable time was spent on discussion on how to work with them. However, what seemed to emerge strongly were the contradictions that would arise from working with government as a member of the proposed forum (which became an association). The learning trajectory above shows how research participants started off by treating government with suspicion proposing to exclude them altogether. As the conversation progressed, research participants noted that it was imperative to engage them largely as supporters (not as players in the forum) because of provincial government's track record but also because the forum members felt ill-prepared for their engagement. Towards the end of the conversation, there is a clear indication that engagement with government is not only desirable but also necessary, based on experiences from countries whose organic sector had grown rapidly and also on the fact that government would have an interest in the success of the sector if emerging farmers meaningfully benefited. But then government is also known to be a key player in the production of high external agricultural inputs and the final decision after this point was that they would be involved as stakeholders – supporters, not as insiders.

8.5 MY ROLE AS A RESEARCHER BASED ON INTERACTIONS

During the CL and feedback workshops and meetings, my role as a researcher assumed a number of dimensions which are discussed below based on inductive analysis. The evidence outlined to support the conclusions is not intended to and does not exhaust the evidence but serves to illustrate.

8.5.1 Probing

The conversation below illustrates how I probed during the expansive learning process:

#837: Who attended the meeting, and who convened it?

#838: There were some representatives from farmers, representatives from NGOs, the Ministry of Agriculture and other ministries.

#839: Who invited people to attend?

#840: Actually, it was in the hands of the Department of Research, through the support from FAO. So FAO is interested in the seed policy. So the policy document has been compiled, has been discussed and some recommendations made. So it will be tabled in parliament.

#841: Was there representation from MADF and RSDA?

#842: *Yes, I was there, Me"MT was there.*
#843: *And did any of the farmers here attend the meeting?*
#844: *No.*
#845: *OK. So when did you get the farmers from, the ones who attended the meeting?*

This above example is drawn from a feedback workshop in Case Study 3.

8.5.2 Connecting people and ideas

I draw on an example in Case Study 3 to illustrate this role:

#884: *OK, thanks very much. I am quite impressed by the good relations between RSDA and the DAO office here. I am wondering why the DAO office is not responding to the request that was made by the farmers. Are you, did you know about the request and what role do you plan to play in order to help?*

#890: *I think that's a very important point because it was raised at the beginning of the interview process. But then we have been hoping all along that you have been working together. When you went there [MADF offices], I was impressed that there is compost being made and sold, but the RSDA people also didn't know about that. So I think you are right that there is need for collaboration.*

The first part of the conversation is inviting MFS-supporting organisations to connect with the agriculture officials in the district to respond to the request of the farmers while the second is concerned with linking efforts of the MFS-promoting organisations.

8.5.3 Inspiring research participants

The first example in Case Study 1, I congratulated the research participants for the progress they had made on their own after the CL workshop:

#501: *To be honest, I did not expect you to have moved as far as you have moved. It is quite amazing. It was in March and a lot of things happened. Congratulations.*

Another example of providing inspiration comes from Case Study 3, in which research participants pointed out that the research helped farmers to talk with MFS organisations and „reinvigorated“ the spirit of the MFS practice:

#896: *Okay thanks very much, if there are no further comments, I would like to say thank you very much not just for today but for the whole period of time that we have been talking to each other. I will be leaving tomorrow and I wish you all the best. Thank you very much.*

#897: *We are sad.*

#898: *You say you are going, who are you going to leave us with? Try to stay.*

#899: *Yourselves. [Laughter] I hope there will be another time but this is the end of my study.*

#900: *Ntate we also thank you because through you we were able to meet the Foundation. So it was good from our side. It re-invigorated the spirit of the MFS in a way.*

I draw a third example from Case Study 3, in which the heads of the MFS organisations, who did not take part in the CL workshops but read the reports had this to say:

Researcher: *Is there something that has come from the research process that you have found useful or that you have used?*

MT: *For us, I do not think that there is anything specific except that it worked as motivation. Okay it was motivating to know that some researchers would be interested in our low class farming system that nobody seems to be interested in. It gave us motivation.*

Researcher: *Okay how about you Ntate?*

SR: *In your first paper you also mentioned that MFS was under-researched and that gave me impetus as a researcher to actually research on MSF. I was doing it alone just for the sake of knowing myself, what makes it tick? But now with that finding in your research that MSF is under researched, I will continue to do the research. (Feedback Interview L #1)*

The fourth example draws on Case Study 2 where the inspiration seems to be connected with making the need for collaboration with others more conscious:

EM: *I would like to thank you very much Mutizwa because without that workshop ... you are as much part of the evolution of this thing and where we have gone and where we are, because without your interest and your identifying us ... as an avenue of your studies, we wouldn't have come to this conclusion. There is an evolution of where things go and you have been a great part of it. I want to thank you very much. You have added tremendous workload to my already busy work.*

Researcher: *Thank you very much. No I was just passing through and I had a short encounter with you. It was your journey.*

BM: *It has been fascinating Mutizwa like EM says, we have been proactive with organics at a personal level and at the community level you know, we have been passionate about it. But you have really given us a direction, where we did not realise that we needed to take it, move on to the next, another level with what we were doing. Because we are building it up, it was fragmented. Although EMO is very consolidated and very well focused, our social work, community work was very fragmented. I had begun networking but I was not aggressively pursuing it because I did not know it could be done on a sustainable basis. (Feedback Interview SA #1)*

8.5.4 Creating space for difficult matters to be raised and discussed

Here I draw on two examples from Case Study 2 and Case Study 3 respectively.

Researcher: *BM do you have any comments to make about RZ and her involvement?*

BM: *For me it is becoming more and more important. Since the forum has happened I have also been busy starting a new project and EM has been running with the forum development, and so I haven't really spent much time assessing it. And I am very glad that you have come back now at this point to pose these things. There is one thing that struck me on this business above everything else is that because I selected members from the forum, together with EM and discussions with other people as to see, basically disseminated what needs to happen, what its functions is and who is gonna be the best person to perform each function. And I came up with a group of people within my resources. But since Mutizwa has arrived it has been very clear to me it is not a very balanced group. Like we are not from an ethnic point of view, I have got one Mr Nkosi who is going to be working with us, and the rest of us are all white.*

The issue of race and ethnicity, which characterised earlier and later apartheid South Africa for about three centuries, seems to be still embedded in the habitus of people. It appears to be one of the potential areas for enriching the learning and development processes in the organic sector as people bring their different histories and experiences together.

In the second example, there are two parts to the creation of spaces for deliberating difficult issues. In the first part, a difficult issue is raised in a feedback workshop and in the second part, I raise the issue with the concerned people.

#889: Me" is saying it has been a request from farmers that RSDA and MADF should work together. But it doesn't seem so. And she is saying if the top officers are not working together even if we want to collaborate, it would be difficult because the top officials are not taking that into consideration...

#891: Me" is actually emphasizing on the importance of collaboration between the two top officers. She has realised that the gap was small at the beginning but as time went by she realised that there's a gap that is between the two offices was growing, until now that there is a huge gap, of which she doesn't even know how to close that gap. It seems there's a donga in between the two offices, which needs to be closed so that we can improve the MFS.

The second part of the deliberating on the „donga“ between the two leaders went on thus:

Researcher: So why haven't you been meeting and discussing?

MT: We discussed with the PELUM coordinator on an individual level. He did not come back to me and I did not go back to him

Researcher: Now as the two main organisations promoting MFS, yourselves and RSDA, are there specific things that you can do together in this direction?

MT: Working on the messages so that we know that for facilitators this is the tool kit that can be used to train them and they can take it away...

Researcher: Thank you, anything else?

MT: I think part of the reason why we have not been talking to each other is that we have not had funding for networking activities for a very long time.

Researcher: Do you need a lot of money to meet like this and plan together?

MT: No we get busy with other things and targets.

Researcher: Okay. I understand in the past you used to share staff, for example staff from here going to help RSDA in training farmers and vice versa. But that appears to have stopped.

MT: They trained our staff and farmers before MADF office was set up. Unfortunately when the office was set up, they were some problems. I think it is us who started not talking to you and getting busy with other things.

SR: I agree with you Mutizwa that it is not necessarily a question of money. We should meet and discuss. I remember in the morning when we were talking about a new way of building compost. They [RSDA] did not know about it and we are already selling it, it is not good.

Researcher: Yes, it is not good. It is not good.

MT: Because of our dairy demonstrations we have so much manure that we cannot even dispose.

SR: Yet we really need it.

MT: We need to give ourselves time.

8.5.5 Reminding participants of commitments they made

In Case Study 1 the following statement illustrates how I asked participants to comment on their commitments:

#564: Thanks, the other problems were not as big they are still important. There was a problem about cooperation among teachers. Then there was the problem of tools and solutions. Did you go any farther from modelling?

In Case Study 2, I used the principles agreed on by the research participants during their CL workshop to find out if they were observing them:

Researcher: So you have done the research and you have done the logo?

EM: I am doing the research.

Researcher: How are you linking with the other members of the association, the forum? What is the communication? (Feedback Interview SA #1)

In Case Study 3 participants were invited to comment on their commitment to participate in seed policy deliberations in the country:

#835: Ok. Thanks Me". There was an issue about seed security, the seed policy not being supportive of farmers, and there were promises that something was going to be done about it. Did you do anything about it?

#836: Yeah, I will answer that from my perspective. The seed policy, it, there was a meeting where it was discussed, but it was discussed in a way that it should be improved before it can be taken to the parliament for approval.

8.5.6 Clarifying and suggesting

Although there were other instances where I clarified and suggested in this case study and in others, I use one example to illustrate how I performed this role:

Researcher: Those are the findings in short, any questions?

MT: I think things are a bit clearer. The study managed to demystify MFS. We could see that we had big challenges but it helped to have someone come from outside to try and demystify things so that we can see clearly. We have managed to get conclusions that are broken and easy to tackle. There are findings that are easier to tackle and others that are very difficult that MADF alone or RSDA alone cannot tackle. We have to find a way of how to move forward before we are bogged again in our daily routine and we start forgetting about the recommendations...

SR: Your research has opened our eyes into some things we were not aware of. As far as the facilitators are concerned, the level of understanding of the MFS is not the same, yet they go to tell the farmers about the MFS... Your recommendation of training government extension workers, I think I agree with that fully. (Feedback Interview L #1)

8.5.7 Facilitating participants to reach mutual agreement

I draw on Case Study 2 to illustrate how I played this role. Turn 209 makes explicit the two different ways in which the object or solution was conceived in two groups in preparation,

while (sequences # 2.2 and 3.3) summarise the mutual agreement that has been reached. Sequence #2.4 sums up the potential conflict that may arise if one of the participants takes the forum as his brainchild, which is what the participant was hinting at. I draw attention to how counterproductive such an attitude could be and thereafter the conversation takes a constructive turn towards reaching mutual understanding. I am inclined to conclude that summing-up was not a non-partisan act, but rather one that embraced and expressed the systemic view that I maintained. Another instance in which I sought to summarise and clarify different perspectives is captured in the speech turn below:

#209. What I seem to be hearing are two related points but potentially contradictory, I think. Your group has an idea of who in terms of the forum, it sound like it has defined who the forum was going be made of and this group is suggesting that we start something new, something afresh. I don't know if I am right.

8.5.8 Conclusion on my role

My primary role then seems to have been that of asking and probing, of making the picture clearer, more visible, as well as that of drawing participants towards the common ground from which they could have a good view of the shared object. I also enabled them to bring out some of the more difficult issues, the more „unconscious matters“ onto the table so that they could engage with them. In a sense, I helped make their collectively developed zone of proximal development more visible and explicit. This role appears to meet the interventionist’s task in research as discussed by Pihlaja (2005) and Wals et al.’s 2009 idea of the role of facilitators in social learning processes (see Section 4.1).

8.6 CONCLUSION

In this chapter I worked with data from CL workshops and used micro-level tools of analysis to better understand the kind of learning and agency development processes that were taking place. Agentive talk analysis appears to be a good way of assessing how participants get ready for action using language as a mediating tool. I looked at how knowledge has been used for the development of agency. Knowledge, in this sense may be seen as „capacity for action“ as derived from Francis Bacon’s observation that „*scientia est potentia*“, which suggests that knowledge derives its utility from setting something in motion (Stehr, 2001, p. 497). The translation of Bacon’s observation to „knowledge is power“ is somewhat misleading because, as Stehr (2001) notes, *potentia* means capacity. Agency in this sense is therefore found to reside in causing human action. The study illustrated the importance of collective and relational agency in addressing matters of common interest which has a bearing on socio-ecological and economic development of communities and underlined that individual agency would have been inadequate to bring about the critical strength needed to make a difference. This is an important insight into change oriented learning and sustainability practices that operate in a context of a risk society and risk epistemologies.

Collaboration between government, farmers and NGOs held much potential in Case Study 3; while collaboration between marketers, farmers and NGOs also held potential for the growth of the organic sector in Case Study 2. In Case Study 1, it was the collaboration between the schools, the farmers, members of the community, transporters and the political leadership in the area that enabled the resolution of contradictions that were being encountered.

Metaphors were also analysed in terms of how they were used in agentive talk as well as in reflective talk. There was evidence to suggest that metaphors were commonly used across the case studies, especially to summarise complex ideas. As Koskinen (2003, p. 73) noted “through metaphors, people put together what they know in new ways and begin to express what they know but cannot say.” They were used largely to show where participants wanted to go, to construct the zone of proximal development or to articulate a sensitive point.

Reflective talk analysis on the other hand appears to be helpful in assessing the extent to which participants are drawing learnings from their activities for future use. Analyses of learning trajectories in a CL workshop situation helps one see how actors are influencing each other in a process that enables them to develop a more complex understanding of the object under discussion, which has potential to enhance capabilities. In the next chapter (Chapter 9) I discuss theoretical and methodological matters that I found significant in the research journey as a contribution to theoretical deliberations on social learning processes as part of addressing the last two research questions, these being:

- How can sustainability be better learnt and more reflexively practised in the farmer’s workplace?
- What conceptual artefacts can the study develop to support expansive learning for sustainability in farmers’ workplaces?

CHAPTER 9: Theoretical, Methodological and Practice Reflections and Contributions

9.1 INTRODUCTION

This chapter discusses the research largely in terms of my experiences in working with theory. I use it to reflect on the use of the various theoretical tools and frameworks and especially to comment on those which had particular significance. The chapter is therefore primarily concerned with assessing the relationship between the theories I drew on and the realities which I encountered. This way I hope to contribute towards how others may work with similar theories and methodologies. I also used the chapter to propose tools that researchers, development practitioners and farmers can use in their everyday practices in keeping with Glasser's (2007) recommendations on what co-learning should achieve (see Section 3.4). But more importantly this chapter address the last two research questions (see Section 1.5) about how reflexivity can be enhanced and what tools can be developed to support the learning and development of sustainable agriculture practices. Some of the tools suggested in this chapter are based on discussions in the previous chapter (Chapter 8), while some of the discussions in this chapter feed into the recommendations in the next chapter (Chapter 10). The tools have been designed for adaptation and application by development facilitators and farmers working in different contexts and interested in change oriented learning and development. It is hoped that through the Rhodes University and Southern Africa Qualification Authority Research programme, the tools will be tested and refined too. A preliminary application of one of the tools during the research study suggested that there is need for such tools and that they can be adapted.

At the beginning of the thesis, I indicated that I was going to work with dialectics, reflexivity and agency as key concepts (see Sections 1.6.1 to 1.6.3) because they provided me with a good conceptual framework for engaging with the research questions and contexts. These concepts were also useful for approaching and engaging with research in the field and in the cabinet. These were, in Elias' language, „sensitising concepts“ (Ritzer & Smart, 2001, p. 354) which helped orient the approach to the study. During the research journey, it was interesting to note that there was a particular sequence in which I broadly worked with these key concepts. Dialectics was usually the first layer of engagement with issues in the field through the surfacing of learning and development contradictions in the three study sites. This was often followed by a period of reflexivity about how to deal with the contradictions through various processes of analyses with participants and later without participants. Participants worked out solutions, some of which not only directly addressed the main issue that they were facing but also the contexts, resulting in double-loop learning. After the modelling of solutions, agency assumed primary focus in all cases as research participants took action to

resolve tensions in and between their activity systems. I had a dialectical relationship with research participants because sometimes I acted as a participant, getting involved in what they were doing but at other times I detached myself from their situations. I also exercised reflexivity in the way I worked with participants and thought about the research. One of my main roles, as explained in the interventionist intentions of the research design, was to help build the agency of research participants and that appears to have happened (see Section 4.1). But the main point here is that there were various processes in which I worked with research data.

In short I worked with dialectics through examining structure and agency relationships and by surfacing contradictions with research participants. I worked with reflexivity through the expansive learning process, which included deliberations on reflective talk. I engaged with agency through facilitating processes that resulted in participants taking action to change their situations. The analysis of agentic talk constituted another layer of engagement with the notion of agency and how talk and language help people to get ready for action. This was to develop a more refined insight into social learning processes that are expansive.

9.2 THEORETICAL REFLECTIONS AND CONTRIBUTIONS

The second layer of reflections, after the broad conceptual stratum, is the theoretical. This subsection discusses the key theoretical and other organising concepts that I worked with in the research within the critical realist, CHAT and structure and agency theories, including those around practice.

9.2.1 Temporal and spatial expansion of the object of agriculture

Engeström, Puonti and Seppänen (2003) make the point that in organic farming, the spatial and temporal object of farming is expanded, as farmers have to deal with the concept of resource base sustainability which has an implicit temporal dimension while at the same time the land or natural resource exists at a particular place. They come up with four kinds of objects: ambiguous; marketing; resource; and integrated. The marketing object has a short term orientation while the resource has a long-term focus on building the natural resources base. The marketing and natural resource base orientations can however be integrated to ensure that the short-term economic gains are made at the same time as building the resource base. They cite crop rotation as one means by which the integrated object is achieved. In their study, the main point that emerged was that sustainable agriculture is concerned with achieving what they call the integrated object.

In this study, based on Yunlong and Smit's (1994) framework of sustainable agriculture and the concept of triple bottom line in agriculture and sustainable development, the expanded object integrates economic, ecological as well as social sustainability values. This was my

point of departure which was also supported by data from the field. Seppänen and Koskimies (2002) make the point that organic farming is concerned with farming beyond one season and across years. This also shows how different practices of sustainable agriculture demand time to: build the soil; enhance agro-biodiversity; build desirable pest predator relations; recharge water tables and provide other water holding capacities to enhance water-holding capacity of the soils as well as time for the farmer to learn, master and appropriate certain practices as discussed in Section 5.9.

One of the most powerful tools used in the Machobane Farming System to expand both time and space is „relay“ cropping, where one crop is planted after the other throughout the year, in a manner that takes into account earning income (potato as the cash crop) and builds the ecology of the soil using legumes, while at the same time applying organic manure (see Section 5.7.1.8). As already discussed in Chapter 5, space is „expanded“ in the sense that a piece of land that ordinarily produces once a year ultimately produces three to four times; it is as if its size has been trebled or quadrupled.

In Permaculture, the design system provides for the optimum use of vertical and horizontal space. In organic farming the re-conversion period, has important time and space dimensions. There is a minimum number of years before a former conventional agriculture land can be certified for organic production. Similarly there are minimum distances that are required between farms producing organically and those that are not. This causes a serious challenge for smallholder farmers in communal set-ups. The main contribution of this study is that different places will have different spatial-temporal effects and dimensions on ecological crop production for the market, depending on the amount and spread of rainfall, the temperatures and the soil qualities, which indicates the contextual nature of object expansion. The second is that the object is not only economic and ecological but also social. Sustainable agriculture is concerned with expanding social benefits for the concerned communities, through, for example, creating employment and making sure that benefits from agriculture are distributed fairly, within the producing families and groups as well as along the agricultural production chain. This resonates with the concept of fair trade which is dominant in organic discourse. The social dimension of the object is also concerned with building the resilience of communities in the face of risks associated with climate and other environmental problems as well as with human activities such as global financial crises or national bad governance, poverty and health, primarily HIV and AIDS in a southern African context.

9.2.2 Agency

As discussed earlier, agency denotes a capability to do something towards a desired end. This study worked with and developed three forms of agency: individual; relational and collective. Individual agency was exercised in change laboratory workshops where participants, using

their distributed knowledge, made suggestions that contributed to the development of model solutions (see Section 8.5). This level of contribution is well illustrated in the discussions on agentive talk (see Section 8.2), which increased in density during the construction of models and in the planning of their implementation. During the CL workshop on MFS in Lesotho, we spent valuable time listening to an innovation on the design of MFS, which farmers from the other area were keen to adopt. As researcher, I also exercise my agency through engaging with participants, challenging them and providing tools that they could work with in order to interrogate their situations and improve them. Individual agency was initially concerned with an individual externalising what they knew towards the construction of a new tool or object. After successfully overcoming a disturbance in the local community the *individual people* who had taken part in the crafting and implementation of the collective solution, felt confident and „comfortable“ although reflection later revealed ongoing reflexivity associated with individual agency. Discovering the micro-nuances of agency however, required micro-analysis of agentive and reflective talk. My conclusion therefore differs from that of Edwards (2005b) who views CHAT as marginalising individual agency and privileging the collective. Perhaps the most important form of agency built during the research was relational agency. This can be seen in the formation of a committee in the SCOPE case study which brought together Permaculture facilitators, farmers and a government extension officer initially; neighbouring schools and community members; and subsequently brought in a councillor and a Member of Parliament. The good relations that were built between subjects of interacting activity systems increased their social capital³⁸ and therefore their ability to change their situations. Also important was the fact that it allowed them to relate with local leaders in ways that were new and constructive. The establishment of a Durban Organic Forum which brings together organic farmers, facilitators, entrepreneurs, environmental educators and environmental reporters built relations in a way that was potentially going to help them engage with government and other stakeholders on organic farming and marketing matters. In Lesotho, the most important relational agency was built when it became evident that both agricultural extension workers from government and the MFS facilitators wanted the MFS practice to work, and therefore committed themselves to finding ways of working together.

Finally, the study worked with and utilised the idea of collective agency by marshalling the intellectual capital that resided in the individuals to jointly question current practice and build common strategies for implementation. For example, working as a group, the St Margaret learning and development committee was able to claim some legitimacy as well as to raise

³⁸ Social capital is the stock of active connections among people: the trust, mutual understanding shared values and behaviours that bind the members of human networks and communities and make cooperative action possible (Lesser, 2000 in Engeström, 2001c, pp. i-ii). It has also been called activity-based trust (Engeström, 2001c, p. ii)

resources from the community three times in less than a month towards the restoration of electricity which undermined agricultural production in the school. My conclusion therefore is that CHAT is a useful theory for researchers that are interested in intervention research which seeks to enhance the three different forms of agency: individual, relational and collective through change oriented learning. The formation of committees in Case Study 1 and Case Study 2 resulted in some morphogenesis or transformation. In the first case study it resulted in the transformation of the production of vegetables in the school and community access to such services as grinding mills and electricity for reading. In Case Study 2 the relations established between marketers and producers resulted in the marketer's perception of the role of small farmers supporting their growth not as charity but as a necessity for their own survival. There was also a morphogenetic development of relations between the District Agriculture Extension Office in Maseru and MFS-promoting organisations, which culminated in the setting up of an MFS demonstration plot.

9.2.3 Zone of proximal development

Del Rio & Alvarez (2007, p. 301) defined the ZPD as “a zone of human development, the frontier where we can find the links between the situated-embodied mind and the cognitive mind; the individual mind and the social mind; the development already attained and the development to be attained”. This study worked with the concept of ZPD first by understanding farmer learning objects, processes and current obstacles. After establishing this, it went on to define „the development to be attained“ through the construction of a shared object in each case study. This way, the nature of the ZPD had changed from that of individual farmer to that of the farmers and those with whom the farmer was working. In SCOPE this was primarily Permaculture teachers in the school and potential consumers of their produce farther afield. In MFS this included MFS facilitators and government extension workers; while in Organic Farming this included promoters, entrepreneurs and environmental educators. The zone of proximal development was therefore co-constructed in each case study and between activity systems. In all cases the ZPD was concerned with the improvement of a sustainable agriculture practice that was under review. However, in the process of working towards the development to be attained, individuals also had their levels of understanding of the object improved (see Section 8.4.1). This is revealed in some of the comments made by participants at the end of workshops. It resonates with the assertion that expansive learning processes address: scaffolding; the linking of everyday knowledge with scientific knowledge; and societal learning which jointly addresses new and emerging problems. Such a zone is socially situated because it can never be the same in different societies and ecological environments at the same time. However, there is always the common object of achieving social, economic and ecological sustainability which can be seen as the desired development to be achieved. During this research process a tool was developed (see Section 9.4.1) that can help to identify where challenges lie and therefore where such a

zone is found in the practice as it is locally implemented. Although the study worked on three separate kinds of sustainable agricultural practices, I am cognisant of the need to combine the strengths from each of these practices towards sustainable agriculture. I am also interested in the future development of sustainable agriculture and have therefore devoted part of the concluding chapter to write about the future of the history of sustainable agriculture, whose framework is ZPD (see Section 10.3.2).

9.2.4 Agricultural cognition

Based on Engeström's (1995) notion of clinical cognition, which argues that cognition concerns not only the knowledge of the expert health worker but also that of the patient, I found it pertinent to discuss the notion of agricultural cognition in the context of sustainable agriculture (see Section 8.4.1). Farmer knowledge of agriculture seems to form an important part of agricultural cognition. The small-scale sustainable agriculture farmers with whom I worked indicated that they had a good understanding of local ecology and of what crops would grow best when. They also used observation to manage their gardens and fields. Many of them showed that they had situated and practical knowledge of farming, most of it derived from many years of „working with soil“, some of it passed on through families and friends. Formally educated extension workers and researchers constitute part of the agricultural cognition. They often come in handy to explain the invisible, those things that cannot be seen with the naked eye. Apart from bringing in new knowledge and tools, formal scientific research provided explanatory answers. The main point is that the knowledge and skills of the extension worker, the facilitator and the researcher cannot work unless the farmer is involved and the farmer comes with some cultural capital, no matter how little. In short therefore this research suggests that agricultural cognition is based on an interplay of local, situated knowledge and outside generic knowledge; of different orientations (sacred and profane); knowledge of farmers, facilitators, extension workers and scientists. This finding resonates with new discourse in agricultural development (Scoones et al., 2008) (see Section 2.4). It also resonates with that of a Nicaraguan ecological farmer cited below:

„We have nothing against agricultural engineers,“ explains Marmeto Mendoza [a peasant], „Our point is that peasants and technical engineers should combine their knowledge by means of dialogue, so that peasants could get the real assistance to develop their programmes. The peasants should be masters of their own education and development and this should be respected by technical engineers. On the other hand, there are many things that peasants do not know, and for which they need the know-how of technical engineers.“ (Nielsen, 1994, pp. 25-26)

Sustainable agriculture cognitions also involved boundary crossing in the case studies reported here – between farmer activity systems and those of agricultural extension workers on one hand and sustainable agriculture on the other; between farmer activity systems on one hand and those of agricultural marketers and consumers on the other; between the school

activity system on one hand and the farmer (community) activity system on the other in the case of SCOPE. Leeuwis (2004), discussed earlier (see Section 2.3.6.2), raised concern about absence of theory to link the old school of extension and the new. This kind of agricultural cognition, built on the socio-cultural foundations of CHAT, may provide potential to do this.

The study has shown that traditional divisions of theory and practice, mind and body, thinking and doing, brain and hand, are inappropriate and that practical knowledge in terms of tacit knowledge and situated knowledge are also important. Drawing on Aristotle, Dean (2006) and Gustavsson (2007) described three perspectives of knowledge. Theoretical knowledge, also called objective knowledge (*episteme*), where knowledge produced is about „things which cannot be otherwise“, is eternal and universal. Technical knowledge is concerned with making things or fabrication (*techne*) and is also called practical-productive knowledge. Ethical and political knowledge, needed when working social or cultural matters (which may be called ethical and political knowledge) is called *phronesis* or practical wisdom (Gustavsson, 2007, p. 321). *Phronesis* should also include the socio-ecological matters (as shown in this study), especially given the present day challenges associated with the ecological environment. Discussing *phronesis*, Dean argued:

What is involved here is a practical rationality consisting in the ability to make good judgments (about „men“ and circumstances) under complex and changing conditions ... acquired through face-to-face dialogical speech, in particular through the speech of deliberation with fellow citizens concerned with care for the shared world. (2006, p. 129)

In discussing *phronesis*, that is practical wisdom comprised of the political and *ethica*, Gustavsson (2007) noted that:

The sign for practical wisdom is value based action. We cannot act ethically without certain criteria for what is good for ourselves, the community and humanity. If we look at the huge discussion about ethics, we can recognise three schools, or traditions. The most influential is utilitarianism, consequence ethics, where the measure of good action is what the consequences are in terms of utility... The second rule is ethics, or duty ethics. From a general rule, „act as if the imperative of your action could be the general law, you could develop a general universal ethics for humanity“. The third alternative is virtue ethics, or Aristotelian ethics, which tells us about the concrete situation and making good judgement to be able to act in a good way. (p. 323)

The fundamental task of ethics is to achieve “good life, with and for others through just and correct means” (Gustavsson, 2007, p. 326).

Sustainable agriculture learning and practice appears to have intentions beyond combining commonsense and scientific knowledge but can be seen to carry ethical dimensions, especially with its interest in social and ecological sustainability. In a risk society, where post-normal science, cognitive justice and reflexive justice have argued for the combination of different knowledge systems, it has become imperative that *phronesis*, which underscores

good judgement, responsibility and citizen deliberation, intended and actual consequences of human actions, be also included in what constitutes agricultural cognition, so that it goes beyond lay and expert knowledge.

9.2.5 Contradictions

According to Bryant and White (1984), “Individuals such as farmers make rational choices for adopting practices or not based on their assessment of risks, uncertainties and likely benefits” (p. 18). In this study several layers of uncertainties which can be linked to contradictions were encountered (see Chapter 6). As discussed earlier, there are four levels of contradictions in CHAT: primary, secondary, tertiary and quaternary (see Section 3.6.4). The study encountered all levels of contradictions and this proved useful for analysing where tensions lay but it did not prove that useful when it came to boundary crossing activity systems. This emphasis shifted to contradictions that mattered across activity systems rather than those that were activity system specific. The classification of different types of contradictions ceased to be significant as the shared object became the main driver of what contradictions needed to be addressed. What this meant to me was that when the notion of a central activity system is removed and instead, the main unit of analysis is networked activity systems, the need for analysing primary and secondary contradictions falls away, but the tertiary and quaternary contradictions remain significant. In a sense therefore there appears to be a need to reconceptualise contradictions in networked activity systems. Secondly, it is difficult to work with contradictions between different activity systems if people from the other activity systems are not represented or their perspectives are not adequately taken into account. For example, it proved difficult to engage with the government extension system related tensions in the South African case study on organic farming where there was no representation. It was also difficult in the SCOPE case study in Zimbabwe which was attended by one agriculture extension officer out of about 15 participants. Similarly, the participation of the entrepreneurs in the South African case study highlighted the commercial aspects of farming in ways that were not noted in the other two case studies. In the MFS five-session CL workshop, the good presence and participation of government agricultural extension workers allowed for constructive engagement to take place in ways that are likely to not have been possible even if attempts had been made to present them. So the point is, even with role playing and other forms of presenting the absence, there is a limit to which transformation (of relations in particular) could happen. This also points to a limitation of the constructivist foundations of CHAT and the need for critical realist under-labouring analysis, to make the absent, but nonetheless real, more present. The learning trajectory of the discussion of the potential role of government (see Section 8.4.1, Table 8.5) in the CL workshop of Case Study 2 illustrates an example of how the absent were presented but at the same time, how they could not speak for themselves.

A third reflection and suggestions on contradictions in nature-based activity systems is that the nature-culture tensions will always exist side by side in the form of what Cohen (1989) calls existential contradiction. Existential contradiction essentially means:

Although existential contradiction is most directly implicated in the structuring of tribal societies, it fundamentally pertains to the generic relation between human social life on the one hand, and the material/organic aspects of human condition on the other. The existential contradiction may be summarised by saying that human life is both predicated upon nature, yet it does not conform entirely to the natural order, and therefore is set off against it. (Cohen, 1989, p. 260)

As the world reaches peak oil supplies, temperatures rise further and the exploitation of such resources as fish and arable land become more critical issues, existential contradictions might become central sites of looking for ways to live sustainably and users of CHAT in the natural resources field may need to be on the lookout for this level of contradiction.

Fourthly, contradictions offer potential for learning and development when used constructively as shown in Chapters 7 and 8 in this study. In ecology, ecotone is the ecological space between two ecosystems. This space always has greater biodiversity than the ecosystems that merge in it. The process of creating learning and development opportunities between activity systems that have a dialectical relationship can therefore be likened to the process of „creating and living in an ecotone“ because when the subjects from those activity systems bring their cognitions together under environments that are conducive for collaboration, a third space is created. For example when farmers in Case Study 1 were encountering marketing difficulties, they approached transporters and negotiated a deal that enabled both parties to benefit. In Case Study 3, the MFS promoting organisations and the District Agriculture Office of Mafeteng managed to work out a deal that allowed MFS practice to be showcased but in a way that would enable the researching and documentation to be for the benefit of both parties as well as the farmers.

9.2.6 Boundary crossing

Boundary crossing can be seen as a process of collective concept formation whose potential lies “embedded in transporting ideas and instruments from seemingly unrelated domains into the domain of focal inquiry” (Engeström et al. 1995, p. 320). They further highlight that crossing boundaries involves encountering differences, walking on unfamiliar ground, in areas where one is not qualified. They concluded that boundary crossing is a mutual process of problem solving in which initially assumed roles may be changed. Boundary crossing does not, however, have to achieve mutually accepted results for it to be fruitful. It can happen vertically through the hierarchy of an organisation or horizontally between people with different knowledge and expertise. Sometimes attempts to facilitate boundary crossing do not yield results (ibid).

In all three case studies there were instances of boundary crossing which were motivated by the development of a shared object. In Zimbabwe, both teachers and farmers crossed the boundaries between their activity systems and together developed a production-marketing strategy that benefited both in SCOPE. In South Africa the boundary was crossed between organic farmers, organic marketers and organic farming facilitators when they agreed to form a Forum to advance the interests of all the three groups. In Lesotho, the main boundary crossing took place between government extension workers and MFS promoters when they agreed that they would sit down together and develop a methodology for working with people in a manner that reduces tensions and conflicting messages to farmers. A close look at agentive talk shows how boundaries were crossed as participants from different sectors of organic farming in Durban and between farmers and Permaculture facilitators in Zimbabwe reached mutual agreements. Boundary crossing can also be seen in their collective definition of the object on which to work, in the conceptualisation of the shared object. This discussion suggests that those interested in agency and reflexivity in social learning processes would find the concept of boundary crossing useful.

9.2.7 Habitus

Habitus is an underlying social structure shaping the way things are done (see Section 1.7.2). The habitus is made up of a battery of dispositions which orientate a person towards all aspects of life. It is seen as subjective and it interacts with the „field“ which is seen as objective. Dispositions are also influenced by cultural and economic capital (Bourdieu, 1990). The habitus can be interrupted, but this is not easy to do (Hodkinson et al., 2007; Janks, 2008). In addition, an individual’s disposition towards workplace learning is influenced by his experiences beyond that field and in it. This research suggested that some people have „farming in their veins“ (see Section 5.4.2), that farming can be a calling from birth. It was also suggested that children who are born to farmers are likely to be more familiar with farming and therefore be interested in it than those raised under completely different circumstances (see Section 5.7.2). This may be linked to Cussins’ notion of cognitive trails which here would suggest that those who grow in farming communities tend to establish and then navigate their terrain every day. In a sense „cognitive trails“ are established for the farmers as they experience farming (see Section 5.7.2). However, this is not exclusive; people who are born into non-farming families may also decide to go into farming.

Some of the factors that influence people’s attitudes towards farming are concerned with the status of agriculture, which has been declining because agriculture is not seen as „cool“ or „intellectual“. The study suggests that sustainable agriculture farmers have to be patient because the economic benefits tend to take a while in most agro-ecological situations.

Besides, most of the sustainable agricultural practices are labour intensive. Sustainable agriculture has also been stigmatised for political reasons: to advance the interests and needs of agro-industry companies which enjoy high economic and social capital. This research suggests that dispositions are not limited to individuals but to whole societies and that societal dispositions take far longer to transform. This is why the building of an „agrarian consciousness“ may not take only years but could take decades.

But it takes time for people to change dispositions and identity; time and something convincing is needed. This can partly explain the relatively slow pace of adoption of MFS. The story of an extension worker who accepted MFS after at least 20 years of learning about it is a case in point: *“So with me, I was still in the Ministry of Agriculture, working as a researcher under horticulture and I never thought that one day I would find myself joining the MFS and practise it”* (Interview #L3). When he was asked to join and promote it, he agreed and told farmers to do what he was not doing, *“But I wasn’t practising the system myself, no, no, no, no. I was using fertilisers. Here and there I could use organic fertilisers like kraal manure but not the others”* (Interview #L3). In a sense, his identity changed from been a conventional extension worker to that of a sustainable agriculture development facilitator but he was still a conventional farmer himself. Changing identity, changing dispositions, means letting go of what one is used to doing, and conditioned to do by society. And it is often a difficult process as is illustrated by the trainer above.

The study was interventionist and had an emancipatory interest. It was therefore critical to be conscious of the possible consequences of the interventions so that they do not reproduce repressive structures and societies, but rather transform especially the thinking and practice of research participants. It appears that the committee formed in the SCOPE case study and the forum formed in the Durban Organic farming served as fundamental instruments of changing the way things had been done, which previously restricted the actions of the research participants. The engagement between government extension workers and MFS facilitators and farmers in Lesotho also helped challenge the old ways of doing things in a manner that was potentially transforming. I would therefore argue that any attempt at changing practice should pay attention to dispositions that have already been developed in the people concerned as well as in the communities and culture in which they live. An understanding of the historical, cultural, material antecedents and causal mechanisms is also useful for engaging with certain dispositions.

9.2.8 Practice

Bourdieu in his book, *Logic of Practice* (1990), outlines a number of practice dimensions which were relevant in the study which focused on sustainable agricultural practices. These are:

- Practices are time and space bound, that is, there is a temporal and a spatial dimension to them;
- Practices are „experience laden“ in the sense that much of what is practised is tacit or not made explicit but simply done; and
- Practices are characterised by an improvisory and strategic logic.

The study's investigation into practice suggested the centrality of time in the development of any practices, including sustainability practices. It takes considerable time to introduce and mainstream any new practice but even the old must be learnt over long periods of time. The implication for sustainable agriculture practice is that both farmers and trainers should have longer training courses and more follow-up support than is generally the case now. It also means that people will tend to adopt those practices that have some meaning to them because they are strategic. They will adjust the practices to suit their situation which in the case of sustainable agriculture would include rainfall patterns, soil quality, slope, land tenure and eating habits. This is one of the reasons why people-centred learning and innovation should be grounded in farmer realities, through local structures such as village learning forums.

9.2.9 Agentive talk and reflective talk

“Change laboratory appears as a valuable opportunity to study the relation between language and activity because it promotes discussions about and engagement in transformations of the participants’ practice” (Sannino, 2008, p. 250). I found Sannino’s conclusion resonating with my experience in running CL workshops and in the analysis of agentive talk in them. I found it useful to work with agentive talk to understand how participants get ready for action. It allowed me to get a sense of when there were disagreements and how they were dealt with; how participants made suggestions and appropriated them as a group; how individual thinking was brought into „public space“ and processed into ideas towards a desired action. Agentive talk analysis also allowed me to see how participants constructively connected their past experiences and the doability of what they were proposing – linking the future to the historical, cultural and material antecedents of practice. It further allowed me to see when participants committed themselves to act, and finally enabled me to analyse the role which I played in the workshop in so far as agentive and reflective talk were concerned. This provided further insight into the role of Developmental Work researchers.

Finally, through incorporating Sen’s concept of capability and how structures may enable this, agentive talk analysis allowed me to see the extent to which participants were aware of the enablements and constraints. Finally agentive talk analysis enabled me to see how language was used to read agreement on what actions to take, to formulate shared objects and to mobilise participants’ energy and will to act. The two areas in which it could need attention are how to deal with body language and complex statements. It is a unit of analysis that scholars interested in how agency is mobilised in group settings will find useful.

In addition to agentic talk, I found that conducting reflective talk analysis allowed me to see how research participants were drawing lessons from their collectively developed and implemented solutions and increasing their individual and collective fund of knowledge for future action. This constituted the sitting down, which is essential for the standing up in the growing of a practice.

9.3 METHODOLOGICAL REFLECTIONS AND CONTRIBUTIONS

9.3.1 Choosing a generation(s) of CHAT to work with

When I commenced studies I intended to primarily work with the second and third generation CHAT, with the intention of focusing the study on a specific activity system and then possibly moving into how it relates with others. Even though this turned out to be the case, I realised as the study progressed, that I was not going to be the determinant of whether to use third generation CHAT or not. This would depend on the nature of data generated and whether there would be contradictions between the central activity system and the others, which turned out to be the case. So if I had „decided“ to confine myself to second generation activity theory, I would have missed the opportunity to engage with potential spaces for learning and development of the practices and research participants. The second related lesson is around the use of the first generation activity theory. I was convinced that I would not use it and indeed I did not. Chapter 5 and the discussions on use of metaphor in Chapter 8 show the importance of the object, subject and mediating tool relation in understanding learning.

9.3.2 Pacing change laboratory workshops

In Zimbabwe the time allocated for the workshop was initially eight hours but we ended up using ten hours for five sessions. This proved inadequate. A slight increase in time in the Lesotho workshop did not solve the problem largely because of language problems. The Lesotho CL workshop took a total of about 12 hours. The 12 hours were divided into the following stages: Orientation to the workshop; History of the MFS according to three groups of participants; Problem identification and prioritisation; Problem analysis and solution development; Sharing and critiquing problem analysis and solution development; and, Planning the way forward. Six hours of continuous thinking on the second day proved to be a challenge as indicated by most participants when they were asked if they could examine a third problem. The lesson is that the quality of input may fall with time if the sessions are too long. This raises the need to spread such sessions over a number of days and two days seemed to be too short, even if the hours per day are increased. In addition to this, it is important to note that informal conversations continue to happen between sessions. Such moments are essential and should be provided for. But perhaps the most important lesson for

me in working with CL workshops was the need to space one set of sessions and the next in a manner that allowed some meaningful activity to have taken place. Going back to the field about seven months after the workshop provided ample time for research participants to have moved along the expansive learning cycle. Going back three months later allowed me to engage with research participants in Case Study 2 in their process of redefining their tools of the Green Growers Association. Without the feedback meetings and workshops, it was likely that I would have left the field with an incorrect idea of what was to happen. I would therefore recommend that interventionist research of this nature should provide for follow-up CL workshops.

9.3.3 Working with more than one language

From the first CL workshop that we conducted in Zimbabwe I learnt that participants generally prefer to discuss in their own language, so when we held the second workshop in Lesotho, we used the local language, which I did not understand. The use of the local language in the workshop was enabling in the sense that it made participation easier for farmers. The downside was that it then required time for translation. Additional time needs to be factored in for workshops involving translation. The translation was only necessary during the plenary session though. This means that the time needed for a workshop with translation is not double the time necessary if the workshop is held in one language. Another challenge that was created by the need for operating in two languages was that during group work, the researchers, who both did not speak the local language, were unable to guide group discussions effectively. In such settings it would also be important to have regular translations made to the facilitators/researchers during group work. This means that there ought to be more than one translator. But perhaps the more subtle challenge was concerned with being unable to pick out the nuances in what the interviewees and research participants were saying.

9.3.4 Working with video cameras in CL workshops

Using audio-visual cameras in CL workshops was a real asset in terms of getting the necessary data to draw on during analysis. However, I faced a number of challenges in working with audio-visual materials during the workshops. Firstly, my facilitation processes were traditionally anchored in the use of flipcharts to mediate learning. This was especially so in rural settings where electricity is not easily accessible. But I also liked the use of flipcharts because the participants and the facilitator could immediately see and agree on what was being discussed, and more especially the agreements and the process. The three surfaces used in CL workshops therefore met that purpose. But flipcharts do not capture processes, hesitations, language use and other important cues of learning that a video is capable of doing. I only realised the significance of this when I was doing data analysis of the first two change laboratory workshops during which I had not used the video recorder. The

lesson that I drew from my experience is that video-recording should be taken seriously when conducting CL workshops and that proceedings should be recorded no matter how trivial they may appear during the workshop. This is useful for enabling micro-analyses and also body language where necessary.

9.3.5 Constructivist limitations of CHAT and critical realism analysis as underlabour

Working with CHAT enabled participants to construct solutions to address the contradictions that they were facing. CHAT also enabled me to explore learning processes and to assist research participants to expand their learning and practices. The modelling of solutions that are based on a deep understanding of the origins of current limitations is perhaps one of the greatest values of CHAT (see Chapter 7). But I found it particularly useful to use critical realism to underlabour CHAT because it provided me with a tool to seek out deeper causal mechanisms that may have been missed out. For example, the successful stigmatisation of sustainable agricultural practices in South Africa and Lesotho was not simply a contradiction of knowledge systems, or of the economic and ecological logics of time but there fundamental power issues were involved too. The relatively poor performance of small-scale farmers which was traced to land allocation in the colonial era as a socio-historical explanation in CHAT could be further traced to the power that the colonisers had over the colonised. The marginalisation of women in agriculture could also be traced to traditional culture, which embedded certain dispositions that made it look normal for men to control land and other resources (see Sections 5.7.7; 5.10; 7.2.3 and 7.4.8). In agentive talk analysis, I drew also on critical realism to add a category of „awareness of critical activity systems“ (see Section 8.2.1.2). I would therefore conclude that using CHAT and critical realism offers one greater chances of achieving ontological depth in that it extends the constructivist limitations in CHAT that focus on the outcomes associated with who is present and what they say and do. Critical realism, throughout, drew attention to making the absent more present. Epistemological constructivism and ontological realism which critical realism allows for, reduces the relativism of constructivist ontologies.

9.4 POSSIBLE TOOLS FOR USE IN THE FIELD

The fourth and last research question (see Section 1.5) is concerned with the development of tools to support expansive learning processes in sustainable agriculture workplace contexts. In Chapter 7, the discussion of expansive learning processes illustrated some of the tools that were developed during and after the CL workshops. This section discusses tools that I developed from my engagement with the research process. Two of the proposed tools were developed and shared with research participants in the research process. The tools were developed after the field work and in recognition of the value of tools that would both answer

the research question and assist others interested in interventionist research. Wartofsky (see Section 3.6.9) pointed out that secondary and tertiary tools can aid learning and agency.

9.4.1 Tool for assessing the triple bottom line of sustainable agriculture

The dialectical relationship between social, economic and ecological aspects of sustainable agriculture objects continuously creates opportunities for expansive learning in any setting so as to address tensions and improve the weakest link or other tensions that may arise due to the complex nature of the object. In order to reveal the main sites of potential learning, it is important to have a tool that helps pinpoint the area with the most potential for improving learning or practice at any one time in the life of the activity system. Through this research I propose a tool that can be used by farmers, agricultural extension workers/facilitators and researchers to achieve this. The tool represents the object of sustainable agriculture as complex, integrated and three-dimensional, seeking to meet social, ecological and economic needs at once. During the study research participants gave a value to their sustainable agriculture practices against the three dimensions, scoring each against 10 (see Chapter 5). The result gave a good indication of the strengths and weaknesses in the three dimensions. This can make the task of addressing the problem difficult because, although it gives an indication, it does not pinpoint the real issue. With hindsight and based on in-depth data I am now able to propose a tool which can provide the necessary details to stimulate the expansive learning process. The questions will be the same but the manner in which they will be answered will be varied.

The first form of the tool may be called the simple Sustainable Agriculture Practice Assessment Tool, comprising a set of questions to which responses are: yes or no. In order to get a quick overall impression of the practice using this simple tool, researchers or practitioners need to respond to each of the 60 questions. From this it will be clear where no answers exist and this information provides a good starting point for addressing current problems and limitations in the practice. The driving questions are practice centred and explore whether the practice addresses a particular aspect. In order to give a quick visual impression, a colour can be assigned to either answer, so that red can be negative and green positive. This form of the tool is recommended for situations where the researcher does not need to go into depth for each specific aspect and is working with farmers who may not be comfortable with the other two forms of the tool.

Table 9.1: Example of simple Sustainable Agriculture Assessment Tool focusing on Social Sustainability

Social sustainability aspect	YES	NO
1. Gender relations are improved		✓
2. The poor can access and work with the practice	✓	
3. Resources become more fairly distributed	✓	
4. Benefits become more fairly distributed	✓	
5. Costs become more equitably shared		✓
6. Local learning and innovation is enhanced	✓	
7. Knowledge generated and acquired is utilised and shared	✓	
8. Knowledge is stored and codified for future use		✓
9. Exogenous and endogenous knowledge is fused together	✓	
10. Farmers are networked for learning and action		✓
11. Local beliefs and customs support the practice	✓	
12. Social resilience is enhanced	✓	
13. Responsive to globalisation		✓
14. Family and local food needs are met	✓	
15. Employment is created		✓
16. Self-reliance and confidence is enhanced	✓	
17. Young people are learning the practice		✓
18. Government policies are supportive of the practice		✓
19. Government budgets support the practice		✓
20. Social sustainability is explicit		✓

From the above Table 9.1 farmers can see areas in which they need to put more effort in order to enhance their social sustainability. For example, it is clear in the above table that they would need to address the policies. They would also fill in a similar form on economic and ecological sustainability (using the 20-point framework in Tables 9.4 and 9.5).

The medium Sustainable Agriculture Assessment Tool will have three possible answers for each question. The answers can be positive, neutral and negative. The driving question is *which of the three categories* best describes the current character of the practice. In order to make interventions to improve the practice, the most important changes are likely to be needed where the answer is in the negative and then where the answer is neutral. For a quick visual impression, colour codes could also be used, adding brown as the third colour or blue. Table 9.2 below shows how the medium Sustainable Agriculture Assessment Tool may be used based on Economic Sustainability questions.

Table 9.2: Example of medium Sustainable Agriculture Assessment tool focusing on Economic Sustainability

Economic sustainability	Positive	Neutral	Negative
1. Production is increased	Positive		
2. Productivity is increased	Positive		
3. Costs of production are reduced per unit area	Positive		
4. Costs of production are reduced per yield	Positive		
5. The productive potential of the land is improved	Positive		
6. Local economic development is stimulated		NeutralNeutral	
7. Industrial development beyond the local is enabled		NeutralNeutral	
8. Produce is marketable			Negative
9. Produce is profitable			Negative
10. Premium prices for organic food		NeutralNeutral	
11. Technologies are locally developed/adapted,	Positive		
12. Technologies are affordable and available	Positive		
13. ICT is utilised		NeutralNeutral	
14. Costs of maintaining the technologies are affordable	Positive		
15. Farmers can acquire other resources and capital			Negative
16. Professionals in the field are well-paid		NeutralNeutral	
17. The infrastructure supports the practice			Negative
18. The private sector invests in the practice			Negative
19. The practice contributes to the GDP	Positive		
20. Economic sustainability is explicit			Negative

From the table above (Table 9.2) users of the tool can tell that there is need to direct energies at improving the marketability of the produce, market conditions, private sector investment and government support in infrastructural development. The same scoring framework can be used for assessing social and ecological sustainability - see the 20-point framework in Tables 9.3 and 9.5. The advanced Sustainable Agriculture Assessment Tool will have a range of possible answers. For each sustainability dimension, the same questions are asked but the responses will be more nuanced, with a range of 9 scores. The score for each ranges from -4 being the most negative score, to 0 being a neutral score, and up to 4 being the highest possible score under current knowledge and understanding of the object. The driving question is: to what extent does something occur? The scores can be plotted on a graph or in some other visual form such as a radar diagram in order to reveal the negative and low scores, which is where learning and developmental interventions are most needed (see Figure 9.1). The score will then be converted an overall percentage score.

In addition, as a way of summarising the extent to which the object is being effectively understood or practised, scores are added up under each of the three dimensions of sustainability. Each sustainability practice is represented by a line of equal length, starting

from a common point with 120 degrees between each. If the lines are joined with lines at the other end, they form an equilateral triangle (see Figure 9.2). A practice that scores 100 % in all sustainability dimensions fills the triangle, which denotes current ways of knowing. Surrounding the equilateral triangle is a circle, which denotes the whole integrated object, including that which is not yet understood. In order to get a picture of the zone of proximal development of the practice under this form, the percentages per dimension are calculated and plotted along the appropriate lines and joined. The space between these lines and that of the equilateral triangle of the connected dots of percentages along those lines constitutes the practice's current zone of proximal development. The areas where there are high scores will suggest aspects of the practice ripe for sharing with others as „zones of good agriculture“ in the practice. Tables 9.3 to 95 show examples of how the advanced Sustainable Agriculture Assessment Tool can be used. The value of the Sustainable Agriculture Assessment Tool not only lies in identifying the specific gaps and weakness of the object needing attention for improved sustainability in the practice, but also in providing the first layer of information which will then need to be subjected to historical and empirical analysis before solutions may be developed. When the analysis is done and a solution is developed, the next and important dimension of the tool is to then see how the new solution will affect other aspects of sustainability itemised in the table or new ones that may emerge or be identified. This then reveals how a dialectical approach can be used to enhance learning and practice of agriculture.

Table 9.3: Social sustainability scores

Social sustainability aspect	Code	Score
1. Gender relations are improved	Soc1	2
2. The poor can access and work with the practice	Soc 2	4
3. Resources become more fairly distributed	Soc3	2
4. Benefits become more fairly distributed	Soc4	2
5. Costs become more equitably shared	Soc5	3
6. Local learning and innovation is enhanced	Soc6	3
7. Knowledge generated and acquired is utilised and shared	Soc7	2
8. Knowledge is stored and codified for future use	Soc8	-2
9. Exogenous and endogenous knowledge is fused together	Soc 9	-3
10. Farmers are networked for learning and action	Soc10	3
11. Local beliefs and customs support the practice	Soc11	4
12. Social resilience is enhanced	Soc12	4
13. Responsive to globalisation	Soc13	-4
14. Family and local food needs are met	Soc14	4
15. Employment is created	Soc 15	2
16. Self-reliance and confidence is enhanced	Soc16	4
17. Young people are learning the practice	Soc17	-3
18. Government policies are supportive of the practice	Soc18	3
19. Government budgets support the practice	Soc19	-4
20. Social sustainability is explicit	Soc20	4
Total		30

Table 9.4: Economic Sustainability Scores

Economic sustainability	Code	Score
1. Production is increased	Ecn1	2
2. Productivity is increased	Ecn2	4
3. Costs of production are reduced per unit area	Ecn3	4
4. Costs of production are reduced per yield	Ecn4	4
5. The productive potential of the land is improved	Ecn5	3
6. Local economic development is stimulated	Ecn6	2
7. Industrial development beyond the local is enabled	Ecn7	0
8. Produce is marketable	Ecn8	2
9. Produce is profitable	Ecn9	3
10. Premium prices for organic food	Ecn10	0
11. Technologies are locally developed/adapted,	Ecn11	2
12. Technologies are affordable and available	Ecn12	-4
13. ICT is utilised	Ecn13	-3
14. Costs of maintaining the technologies are affordable	Ecn14	2
15. Farmers can acquire other resources and capital	Ecn15	1
16. Professionals in the field are well-paid	Ecn16	3
17. The infrastructure supports the practice	Ecn17	1
18. The private sector invests in the practice	Ecn18	-3
19. The practice contributes to the GDP	Ecn19	2
20. Economic sustainability is explicit	Ecn20	2
Total		27

Table 9.5: Ecological sustainability scores

Ecological sustainability aspect	Code	Score
1. The nutrient cycle is improved	Ecl1	4
2. The energy cycle is improved	Ecl2	3
3. Ground cover is improved	Ecl3	3
4. The water cycle is improved	Ecl4	2
5. Agro-biodiversity is enhanced	Ecl5	2
6. Crops are rotated or inter-cropped	Ecl6	4
7. Locally-adapted species are incorporated	Ecl7	3
8. Biodiversity in the vicinity is enhanced	Ecl8	3
9. Soil fertility and structure is improved	Ecl9	3
10. Various levels of vertical space are utilised	Ecl10	1
11. Pest-predator balance is achieved	Ecl11	3
12. Ecological risks are minimised	Ecl12	4
13. Ecological resilience is built in the farming system	Ecl13	3
14. Responsive to climate change	Ecl14	3
15. Surrounding environment is protected and preserved	Ecl15	2
16. Reliance on fossil fuels is reduced	Ecl16	3
17. Carbon sinking is improved	Ecl17	2
18. Chemical pesticides and herbicides are NOT used	Ecl18	4
19. Chemical fertilizers are NOT used	Ecl19	4
20. Ecological sustainability is explicit	Ecl20	3
Total		59

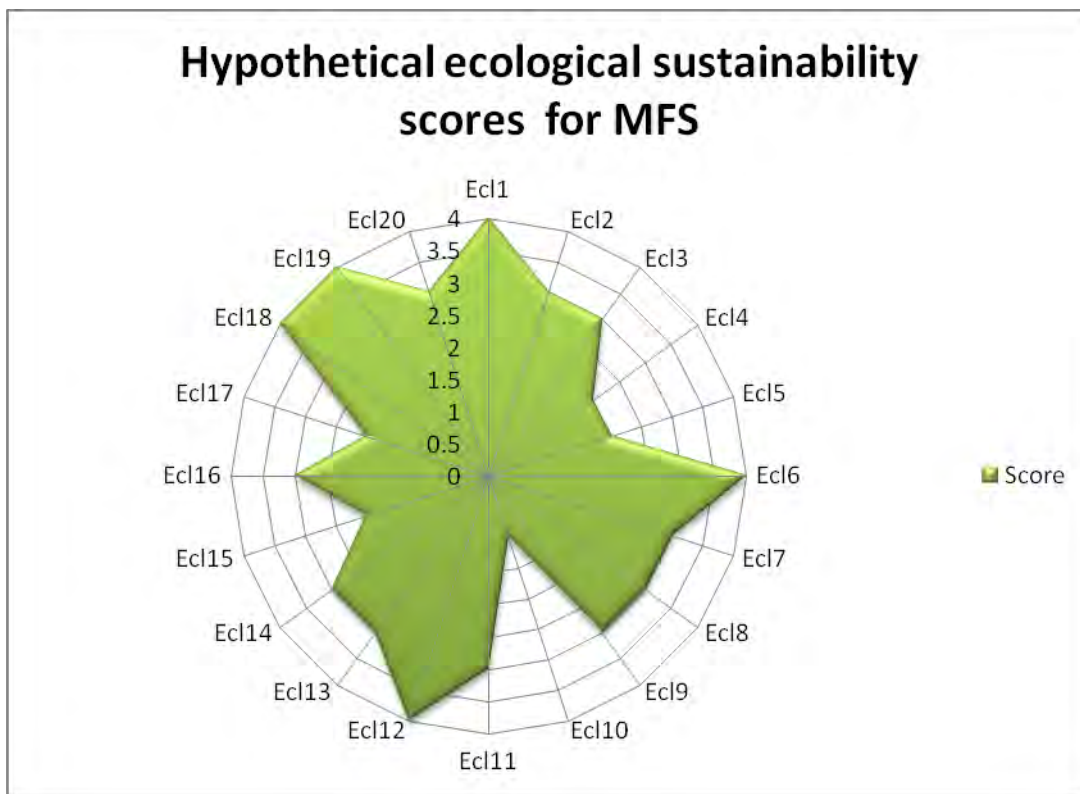


Figure 9.1: Ecological scores plotted on a radar diagram based on Table 5 scores

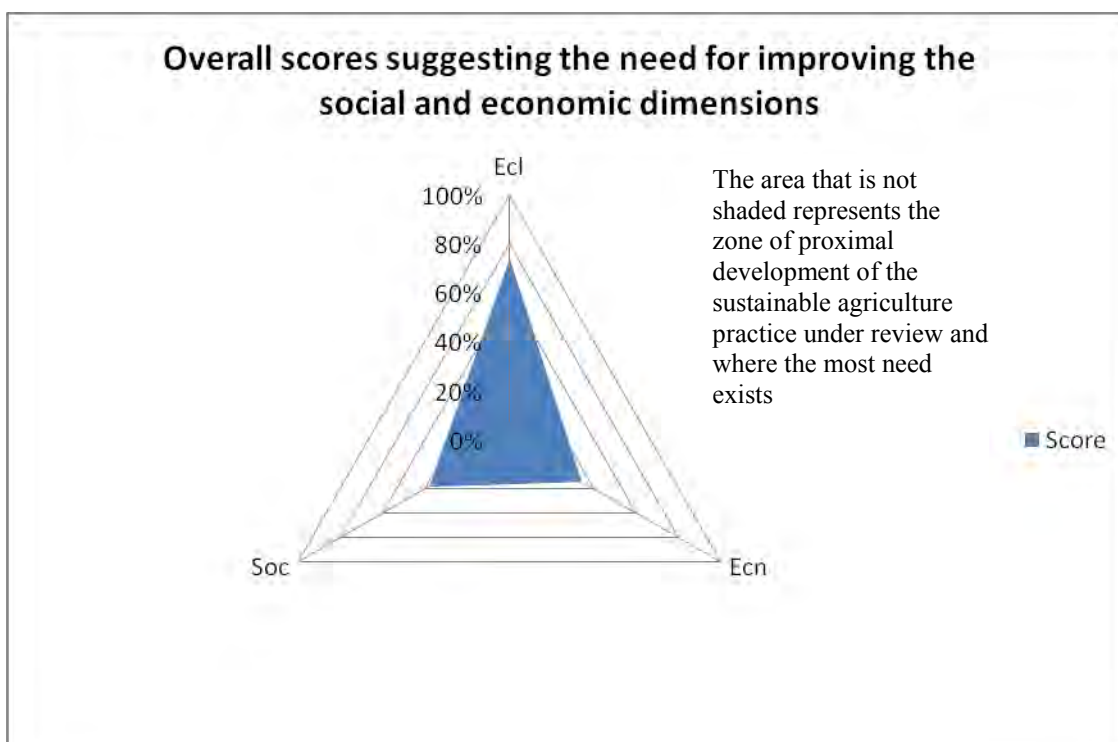


Figure 9.2: Advanced Sustainable Agriculture Assessment example

The tables (Tables 9.3, 9.4 and 9.5) and the figure (Figure 9.1) exemplify how the advanced tool can be used to show areas needing attention in relation to the object of sustainable agriculture. The tables show those areas where the difference degrees of specific gaps are

found while the figure shows which of the sustainability areas needs immediate attention. In the figure above, most of the attention will be needed to improve the economic (Ecn) dimension of the triangle, followed by the social.

I shared this tool with research participants and some of them (at least two) were able to work with it. An example of the feedback that I received on its potential application is shown in the box below (Box 9.1), alongside a summary of the final scores plotted on a triangle with adjustments on the scales (see Figure 9.3).

Box 9.1: Comments from participant FV from Case Study 2

Thank you for calling for feedback on the proposed tool. We have used a similar methodology earlier but this is the first time to see it being developed for sustainable agriculture.

It happened that on 16/10 we took some 30 people (extension staff and community members) to visit a project that is engaged in sustainable agriculture. The participants were invited to peer review the initiative and we took the liberty of using this tool in two groups. Attached, a picture of the outcome. We did adapt in the sense that we use 4 possible scores:

- 1 = No*
- 2 = Marginally*
- 3 = To a fair extent*
- 4 = Significantly*

As for comments on the tools itself, the following was raised:

- *Some questions seem out of place (use of ICT in case of rural development)*
- *There could be multiple target groups (is the activity profitable - for farmer, for community hub etc.) - should the tool be used for each of these separately?*
- *Sometimes difficult to use by outsiders as some information may only be available to insiders (should there then be a mix of both as the opposite could also apply)*
- *Scoring is one thing, discussion the questions is equally (if not more) important. Good facilitation is therefore essential to avoid a few strong voices to set the tone in terms of scoring*
- *Time should be taken to arrive at a collective understanding of the question prior to scoring.*

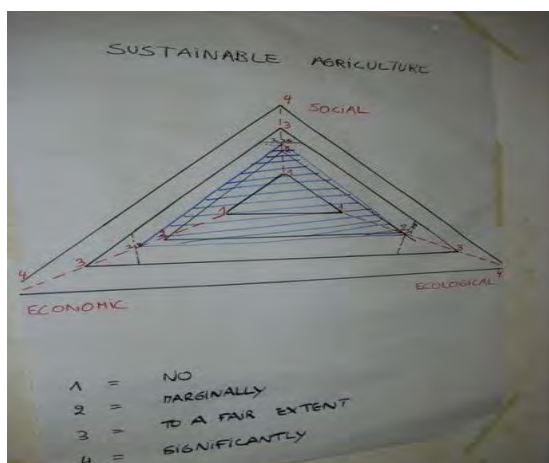


Figure 9.3: Results of use of Sustainable Agriculture Assessment

The use and feedback suggests that the tool has potential use. I also received feedback from a research participant (JW from Case Study 1) who did not use it but felt it had both limitations and potential:

I wonder at what levels you can apply the APSAT tool [this was the acronym I had give to the Advanced Sustainable Agriculture Assessment tool]. To a whole approach like organic farming or Machobane or Permaculture or at the individual farmer level. I can see its value in certain instances. There's definitely something in it. Difficult to respond in writing, feels more like something to talk through. Quite a lot, of course, depends on the questions one comes up with and one could certainly debate some of those. How did you come to the ones you have given an example of? It would be interesting to go through the process of coming up with the questions and then using them. In the coming up with the questions there would be lots of awareness-raising. That would make it more a method than a tool.

In your ecological one there is lots of linkages between the questions; if one therefore the other kind of thing. If there is ground cover and water cycle is improved and nutrient cycle then biodiversity will by implication be improved.

I like the final overview diagram that gives that snapshot, a kind of wake-up snapshot.

9.4.2 Tool for exploring existing learning processes

The tool suggested for exploring existing learning processes is based on my experiences in phase 1 of the study as discussed in Chapter 5. The tool draws on CHAT, theories of structure and agency, as well as on critical realism. The tool is made up of the following set of questions:

A. Purpose

- Why are people learning what they are learning?

B. Factors influencing learning

- What conceptual and material tools are being used to mediate learning processes?
- What individual factors are enabling learning processes?
- What contextual factors are enabling and constraining learning?

C. Perceptions of learning

- How do people feel about the relevance and quality of learning?
- What evidence exists to reflect relevance and quality?
- What is their understanding of what makes good learning?

D. Learning and practice

- How is learning linked to practice?
- How is learning enabling people to act in ways that help them to achieve the purpose of their activities?
- What are the current innovations and how are they shared?
- How is time affecting the learning and practice?
- How are agro-ecological factors shaping learning and practice?

E. Resources and mediating tools

- How are resources such as education and economic capital influencing learning and practice?
- How are facilitators enabling and constraining learning?

F. History, power relations and other factors shaping learning

- How do the histories of the individuals and their communities enable or constrain learning?
- What power relations exist and how do they shape the learning and practice processes?
- What material or biophysical factors are influencing learning and development processes and in what ways?

9.4.3 Tool for identifying contradictions

The study has shown that contradictions can be a fertile site from which to initiate learning and development (see Chapter 7), therefore it appears useful to develop a tool that helps researchers and practitioners to identify contradictions. The table below (Table 9.6) shows how contradictions may be surfaced and prioritised for learning and action. This tool uses an activity system or a number of interacting activity systems as a unit of analysis. For example, farmers who live in a given area and practise sustainable agriculture using common methods and having common goals (i.e. the system that surrounds any activity) make up an activity system. This farmers' activity system may interact with that of sustainable agriculture trainers or agricultural policy makers. The tool is used to identify tensions that may exist in or between systems.

Table 9.6: Tool for identifying contradictions

PART 1: Practices, purpose and mediating tools³⁹		PART 4: Rank and prioritise	
<i>What tensions exist within and between:</i>	Tension between X and Y (Examples) <i>Under each box in this column undertake your own analysis and indicate what tensions exist in your activity system</i>	Rank 1-5 (with 1 as most important and 5 as least important)	Mark degree of ease to address tension: E = easy; M = medium; D = difficult
People and their aims?	<i>Examples</i> <ul style="list-style-type: none"> • Need for income vs desire to protect the environment • Short-term needs vs long-term needs • Need for income vs need for food 		
People's aims and their existing knowledge, experience and values?	<i>Example</i> Interest in producing organically vs only learned to produce using mono-cropping and artificial chemicals in agricultural training		
People, their aims and what they do?	Farmers want to produce fresh organic food vs lack of marketing mechanisms for fresh food Farmers want to produce using organic methods vs farmers are too busy with other tasks to give it enough time		
People, resource materials and learning strategies?	<i>Examples</i> <ul style="list-style-type: none"> • English as a medium of instruction vs. people's proficiency in English • Theory vs practice • Lay knowledge vs expert knowledge 		
Concepts and ideas that guide practice?	<i>Example</i> <ul style="list-style-type: none"> • „Growth forever“ vs sustainable development 		
Preferred practice and nature of practice?	<i>Example</i> <ul style="list-style-type: none"> • Need to increase production and productivity immediately vs long time necessary time to build the resource base 		
Material tools?	<i>Example</i> <ul style="list-style-type: none"> • Need for labour saving technologies vs availability and affordability of the tools 		
PART 2: Practices and how they are governed in an activity system⁴⁰		Should there be something here?	Repeat the headings?
<i>What tensions exist between:</i>	Tension between X and Y (Examples) <i>Under each box in this column undertake your own analysis and indicate what tensions exist in your activity system</i>		
Policies and practice?	<i>Example</i> <ul style="list-style-type: none"> • Government rhetoric in support of agriculture vs budgetary and programme support in favour of high external input agriculture 		
Cultural norms and practice?	<i>Example</i> <ul style="list-style-type: none"> • Land inheritance vs women access to land 		
Environmental factors and practice?	<i>Example</i> <ul style="list-style-type: none"> • Poor soil conditions vs low external input requirements of sustainable agriculture 		
Community and practice?	<i>Example</i> <ul style="list-style-type: none"> • Consumer awareness of food safety and nutrition vs paying for the „real“ cost of 		

³⁹ This constitutes first generation CHAT.

⁴⁰ Parts 1 and 2 constitute second generation CHAT.

	production		
Division of labour and practice?	<i>Example</i> <ul style="list-style-type: none"> • Women do the farming vs men make farming decisions and own the productive resources in farming 		
PART 3: Links to wider systems and actions of others⁴¹			
<i>What tensions exist between:</i>	<i>Tension between X and Y (Examples)</i>		
Resources produced outside the system and resources needed in the system	<i>Example</i> <ul style="list-style-type: none"> • Efficient but damaging agro-chemicals vs environmentally friendly agro-chemicals needed in the system 		
Policies produced in the wider system and those produced in the system?	<i>Example</i> <ul style="list-style-type: none"> • GMO supporting policies and messages vs food sovereignty policies and discourses 		
Needs for the development of the practice and needs of stakeholders and other practitioners?	<i>Example</i> <ul style="list-style-type: none"> • Sick and weak (morbid) community being produced by HIV and AIDS vs sustainable agriculture being labour intensive 		
Current objects of the practice and past of future objects of the practice?	<i>Example</i> <ul style="list-style-type: none"> • Producing for food vs producing for fuel 		
Environmental changes induced from human activities and natural conditions of the system?	<i>Example</i> <ul style="list-style-type: none"> • Increased frequency and duration of droughts due to climate change vs global willpower to mitigate and adapt to climate change. 		

After filling in the necessary details in the second column, the user of the tool decides which contradictions would be most important to deal with (column three) and which of the contradictions would be easiest to deal with (column four). Finally he/she decides on which contradiction(s) to start working on and who needs to be involved in working on solutions. Once this is decided upon, the next stage is to use the tool for expansive learning discussed below (see Section 9.4.4).

9.4.4 Tool for expanding learning /working through contradictions

Based on my experiences in working with CL workshops in three case studies that directly involved nine activity systems I propose a minimum process that those interested in expanding learning through contradictions could use (see Table 9.6). I have divided the process into sessions and depending on a number of factors such as language and the need for translation, each session may last for about three hours. The time between session 5 and session 6 will also be determined by a number of factors but enough time needs to be set aside for participants to have reflected on and improved the model solution. The sixth session should not be the end of the expansive learning process but six sessions is the minimum number of sessions needed to have a good sense of how the expansive learning process may work.

⁴¹ This part constitutes third generation CHAT.

Table 9.6 Minimum process for expanding learning through a contradiction

Thrust	Main activities
Session 1: Orientation	<ul style="list-style-type: none"> • Welcome and introductions • Presentation of workshop objectives and programme • Participants describe their histories in relation to the practice under review and identify key moments in that history and share these in plenary • Researcher presentation of the key concept(s) that are to be worked with: the first stimulation (problematic situation/contradiction); and the second stimulation (the expansive learning model, force field analysis, activity system). • Group work to develop an activity system from the perspectives of different actor groups such as farmers, facilitators/trainers, entrepreneurs and government representatives, documenting rules, mediating tools, community, practice object, subjects (who they are), and division of labour • Presentation and discussion of the activity systems (including finding ways of including the absent) • Discussions on shared objects by the different activity systems
Session 2: Identifying contradictions	<ul style="list-style-type: none"> • Reflections on Session 1 • Group work to discuss contradictions that are being faced in relation to the shared object (use Tool 9.4.1 and 9.4.2) • Presentation of mirror data by the researcher • Discussion of contradictions, clustering and sharpening them • Selection of the most important problems to work on through scoring, ranking and robust discussions on what must be prioritised and why (use tool 9.4.3)
Session 3: Questioning and analysing contradictions	<ul style="list-style-type: none"> • Reflections on Session 2 • Agreeing on key terms to use (e.g. shared vision/object; contradictions/problems or issues) • Participants break into small groups to analyse their identified contradictions in terms of empirical and historical evidence: causes, effects and evolution • Plenary session to discuss contradictions analysed in groups to reach common and deeper understanding. Identify if further research is needed to understand the contradiction and why it exists.
Session 4: Modelling solutions to address disturbances	<ul style="list-style-type: none"> • Reflections on session 3 • Mixed group work to model solutions to address selected contradiction(s) in relation to the shared object • Plenary presentation and examination of proposed solutions
Session 5 Planning the way forward	<ul style="list-style-type: none"> • Reflections on session 4 • Develop a plan of action to ensure that the modelled solutions may be further examined and improved: <ul style="list-style-type: none"> ✓ Include plan to socialise the model solution and receive another level of input from relevant people who did not attend the workshop ✓ Include plan of implementation of the solution which specifies who will do what when
Session 6 Review of implementation	<ul style="list-style-type: none"> • Two follow-up CL feedback workshops (about six months later): <ul style="list-style-type: none"> ✓ How have participants completed tool development? ✓ How has the model solution been implemented? ✓ What are the enablements and constraints in solution implementation? ✓ What lessons have research participants learnt? ✓ What are the reflections of the researcher? ✓ What input can be done to improve the tool, its implementation, or the implementation environment? ✓ What new tensions/contradictions are emerging?

9.4.5 Tool for agentic talk analysis

This study suggested that agentic talk analysis can serve as a useful mechanism to determine the extent to which participants are getting ready to take action. While other factors may constrain or enable that readiness, it appears useful to share suggestions on how agentic talk may be analysed.

Guidelines for agentic talk analysis

- a. What statements suggest that a participant is seeking mutual understanding with others?
- b. Which statements propose new solutions to the problems being faced in the group/community?
- c. In which statement is there evidence that disagreements have been softened or addressed?
- d. Which statements show that the participants are aware of the socio-political constraints to their initiatives and efforts?
- e. What statements suggest that the solution being proposed is doable, either based on previous experience or any other basis, and give reason for being optimistic?
- f. Which statements show that a participant is committing himself/herself to carrying out an action related to addressing a problem or implementing a solution?
- g. What metaphors are being used in the deliberations and what meaning can, or is being attributed to them?
- h. From the talk between and among participants, what is your conclusion about the group's preparedness to act on the matter under discussion?
- i. What was your role in the deliberations and what evidence from the talk supports your conclusion?
- j. What „obvious“ things did the group not say and how are these likely to influence the agency of the group to act?

These questions, together with the framework for analysis presented in Section 8.2 can provide ways of analysing agentic talk.

9.4.6 Tool for reflective talk analysis

Reflexivity has been shown to be an important part of learning and development. One of the ways in which reflexivity can be determined is by looking at ways in which knowledge is being constructed, new ideas are being developed and practices are being improved. Drawing on different kinds of knowledge such as tacit and explicit, technical, theoretical and phronesis, the following set of questions can help reveal what participants have learnt or are learning through analysis of reflective talk.

- a. What new ideas appear to have been generated?

- b. What innovations have been made?
- c. What new ways of saying (language, metaphor or stories) have been developed?
- d. What new constructive relationships have evolved?
- e. What unlearning has happened?
- f. What new consciousness or awareness is evident in the individual or group?
- g. What new ways of doing things have been developed?
- h. What new models or theories seem to be emerging?
- i. What understanding or action on context has been generated?
- j. What ethical values have changed and in what direction?
- k. How has the individual or group judged and acted in a good way for their benefit, the benefit of their community or the benefit of humanity?
- l. What has been learnt about learning?

9.4.7 Tool for supporting reflexivity among farmers

What became increasingly clear from the study was the fact that farmers and farmer workplaces do not provide structured and regular moments for learning and development of the practice. As a result, this is ad hoc, and uncoordinated. This means that some of the things that individual farmers learn get lost or remain confined to their farms – thus denying others access to it. A related issue is that the agenda for learning and developing farming is largely not shaped locally but externally by extension workers, sustainable agriculture facilitators and to an extent, researchers. While this may provide coherence from the point of view of interveners, it is disjointed for the locals who do not have a mechanism to receive and sift support (see Chapter 5). This compromises the sustainability and coherence of local learning. In addition, unlike in structured work environments, farmers in communal settings work independently and separately and their workplace learning needs to be conceptualised in this context of operation so that moments of coming together are deliberately created by them.

The Folk School Movement of Denmark was successful at orienting extension to serve the interests of the rural communities rather than that of the government. These schools were developed in the 19th century and spearheaded by Grundtvig to empower the farmer to feel adequate. He used the schools to build on the natural interests and knowledge of the farmers themselves, which stimulated “their pride and a sense of efficacy and involvement” (Bryant & White, 1984, p. 37). Farmers and Permaculture facilitators in Case Study 1 showed this sense of pride when they were able to collectively address contradictions that transformed not only their lives but also those of the communities in which they lived (see Section 7.2.6, Figure 7.3). The introduction and thriving of these schools has been given as one of the main reasons for the success of Scandinavian countries (Bryant & White, 1984). The folk school concept spread to Sweden and Norway where it has been equally effective. At the core of the approach is the enhancement of farmer **pride and power**. Through it, farmers were able to

communicate their needs and acquire skills. When the concept was developed, most of the farmers were illiterate (Bryant & White, 1984, p. 38). Similarly, there are practices such as *zunde ramambo* in Zimbabwe (see Section 6.3.1.4), *zenzele* among the Ndebele (see Section 2.5.4, Box 2.3) and *matsema* in Lesotho (see Section 5.2.3) that serve a similar function.

It is against this background I propose Farmer Learning and Development Forums as a social tool. As shown from this data, Farmer Learning and Development Forums would meet regionally and periodically engage with others, creating the potential for cross-learning for more strategic and enduring people-centred learning and innovation (see Sections 2.4; 2.5.5 and 4.6). A forum would serve the following functions, among others:

- a. Farmers share individual experiences, innovations and seed for individual and collective horizontal learning (see Sections 5.6.2 and 7.3.2.1);
- b. Receive instruction on topics that they would have identified prior to the meeting from fellow farmers and others to facilitate vertical learning (see Section 5.6.1);
- c. Pose questions and share challenges that they are facing in learning and implementing agriculture to facilitate systemic engagement with issues (see Chapter 6 and Section 9.4.2 for the tool);
- d. Collectively analyse the performance of their practice with a view to identifying weak linkages (covering social, economic and ecological) as well as other constraints to exercising critical thinking (see Chapter 7 and Sections 9.4.1 and 9.4.3 for the tools);
- e. Jointly and regularly reflect on challenges they encounter and develop ways to address them and examine the potential impact of their proposed solutions through innovative thinking. The solutions would include finding other people to help them develop solutions as well as drawing on indigenous knowledge, local culture and exogenous knowledge (see Chapter 7 and Section 9.4.4 for the tool);
- f. Receive and discuss information about new and relevant technologies from elsewhere to draw out what is relevant and useful (see Sections 7.4.7);
- g. Receive and discuss relevant local, national and international information that has a bearing on their work to be responsive to contemporary and emerging developments as well as link up with other relevant actors (see Sections 2.5.5.3 and 2.2.4);
- h. Develop an agriculture research agenda for the area to ensure the relevance of agricultural research (see Sections 2.3.6 and 2.5.5.3); and
- i. Develop general strategies to productively engage with key stakeholders such as government, policy-makers, agricultural institutions, NGOs, the private sector and consumers to make the best use of available social capital (see Section 2.2.4).

As discussed earlier, use of the activity system concept was discussed because of its multi-dimensional nature, which is part of its strength. This study has shown that the concepts and tools provided by CHAT are useful for expanding learning that is contextualised and emergent. Therefore, the set of tools developed out of research processes based on CHAT, theory of practice, and critical realism analysis in this study are proposed for use in sustainable agriculture research, training and extension.

9.5 CONCLUSION

This chapter discussed theoretical and methodological insights that were generated in the study. The insights have the potential to inform researchers who are interested in using CHAT to understand workplace learning processes in which natural and physical resources have a material effect on the learning and practices. The chapter also proposed a set of tools that can be used in change oriented learning processes in sustainable agriculture workplace contexts. The tools can be refined and used to support and expand learning processes for sustainability practices especially in the field of agriculture and potentially beyond. All the tools suggested except one may be called secondary tools while the Farmer Learning and Development Forum may be called a tertiary tool (see Section 3.6.9) which enables the use of other tools, their assessment and improvement. The Farmer Learning and Development Forum has potential to enable double and deuterio-loop learning (see Section 4.3.4) in sustainable agriculture workplace contexts. In the next chapter (Chapter 10), I make recommendations based on findings and conclude by suggesting a history of the future of sustainable agriculture practices.

Chapter 10: Recommendations and Conclusion

10.1 INTRODUCTION

This chapter focuses on practical recommendations based on an understanding of the field in which research was conducted with participants. The discussion in this chapter is linked to the previous one in that both make recommendations but these are directed at different people. Whereas in Chapter 9 the recommendations were intended for scholars, in this chapter they are meant for those with a particular interest in sustainable agricultural practices, how these can be better learnt and practised, and how sustainability can be better learnt in the workplace. First and foremost, I address recommendations to people with whom I worked during the research process. Then I make recommendations for educational institutions that have an interest in workplace learning and sustainable development practices. The conclusion suggests the possible history of the future of sustainable agriculture globally and changed agricultural research, training and extension within the context of Education for Sustainable Development as discussed in Chapter 1.

Preceding chapters addressed the research question on exploring learning processes in sustainable agriculture workplace contexts (Chapter 5) and surfaced limitations and contradictions that are found in the three case studies, using some of them as a basis for expansive learning (Chapter 6). Chapter 7 showed how contradictions were used to facilitate expansive learning and thus contributed to answering the questions on how sustainability can be better learnt and more reflexively practised. Chapter 8 used micro analysis to answer the same question addressed in Chapter 7, focusing on agentive talk analysis, reflective talk, learning trajectories and the role of the researcher. Chapter 9 addressed both the third research question but more particularly the fourth question which was concerned with developing conceptual tools to support expansive learning for sustainability.

10.2 CASE-BASED RECOMMENDATIONS

10.2.1 Recommendations based on the Isidore case study

10.2.1.1 Offer comprehensive training in organic farming

The research has demonstrated that time allocated for the learning of sustainable agriculture in South Africa is relatively little. Organic trainers and mentors are generally under-trained. Therefore it seems a good idea for current Permaculture and Organic Farming training at a certificate level to be extended to cover other NQF levels of education and training. Such a strategy would help produce more competent trainers and researchers who are more likely to be effective in working with farmers.

10.2.1.2 Make appropriate technology available to organic farmers and trainers

The study revealed the need for appropriate technology to support organic farming, especially among small-scale farmers. Some appropriate technologies for organic farming can be *unearthed* from historically agrarian societies. In order for such technologies to be availed, organic farmers could lobby industry and government for either the importation or the manufacturing of such tools. At another level, organic farmers and producers, through their organisations could approach the Department of Technology and Industry to include appropriate tools for organic agriculture in its pursuit of green technology development. In addition to the hard technologies discussed above, organic farmers should continue to pursue improvements in efficacy levels of organic pesticides as these are currently not producing satisfactory results.

10.2.1.3 Ensure that the establishment of the Green Growers Association is inclusive

The feedback mission conducted in Case Study 2 suggested that there were some groups of people who had not been invited to take on responsibility and co-leadership in the development of the newly conceptualised Green Growers Association. This went against the spirit and principles of the guidelines that workshop participants developed during a CL workshop. It would therefore be appropriate for the Board of the association to be made up of representatives from the different stakeholder groups.

10.2.1.4 Support the development of local farmer markets

The study revealed that the weakest link among small-scale and emerging farmers and their facilitators lies in marketing. The Green Growers Association could therefore direct some of its efforts at building this capacity among farmers and NGO people. A related area of focus could be supporting the infrastructural development of local farmer markets and building consumer awareness about the Participatory Guarantee System so that they can take part in building the organic agriculture movement in their respective areas.

10.2.2 Recommendations based on the MFS case study

10.2.2.1 Train government extension workers in MFS

The study revealed that government extension workers have not learnt MFS and this is undermining the spread of a useful sustainable agriculture practice. Government agricultural extension workers need to understand enough about the MFS to be able to train others, especially farmers. They expressed an interest to be trained in MFS so that they would be able to advise district councils and farmers with budgeting and farming. This has the potential effect of improving the agency of MFS promotion in Mafeteng District where the extension officers operate. Their position also underlined the need for MFS promoting organisations to target extension workers in the field in order to increase the extent to which MFS would be

practised. At policy level, MFS has been adopted but lacks budgetary and technical support on the ground for reaching wider range of farmers in the country.

10.2.2.2 Create and support farmer to farmer learning mechanisms

Change Laboratory workshops created an opportunity for farmers to learn from each other, especially linked to an innovation developed by the older group with support from RSDA. Innovators were invited to the neighbouring district. A related outcome was the growth in conviction by other farmers in their ability to be innovators too. The solutions that were developed during the workshop were directed at addressing issues being faced by farmers in the field. The workshop was therefore useful in terms of generating answers to some of their pressing questions. Above all, farmers were happy to continue working with the expansive learning process in their daily activities. The combined outcomes suggest that farmers emerged from the workshop with improved potential for agency. They said: “We will give feedback to our groups and make a plan to implement some of the solutions we generated. We will include the chiefs because it affects them. We will include the Department of Agriculture, especially the resource centres.” The study therefore recommends that NGOs supporting MFS create and support farmer to farmer learning across villages and districts.

10.2.2.3 Establish and implement mechanisms for multi-layered cooperation between MFS NGOs and government

The workshop underlined the value of targeting the intermediate level of government agricultural workers. Whereas traditionally RSDA and MADF have been targeting policy-makers and senior government officials, it became clear during the office that district agriculture personnel from government have great influence in determining what can be budgeted for at district level. In addition, extension workers will only advise farmers about what they know in terms of farming methods and crops. There is therefore a need to address stumbling blocks in MFS learning and practice including lack of government-NGO collaboration in the field.

10.2.2.4 Multi-pronged approach to address double stigmatisation

The government is best placed to deal matters of double stigmatisation of MFS, land tenure and provision of budgets to support MFS and other forms of sustainable agriculture. Given the global increase in food prices, it is important for Lesotho to make agriculture more attractive, especially to the youth. This means, among other things, providing sponsorship for those who want to study sustainable agriculture as well as paying good prices for agricultural produce. In addition government needs to stimulate and support local farmer seed production and remove barriers to local seed production and certification systems. The land tenure system needs reviewing so that the policy encourages building the soil, and the ecological dimensions that support long-term productive capacity.

10.2.3 Recommendations on the SCOPE case study

10.2.3.1 Establish cluster-based learning and development forums

SCOPE stands to gain and grow from facilitating the establishment of learning forums in the schools and among schools that it works with. The learning forums would be used for sharing farmer and school innovations, and challenges. These could be seasonal activities at school, district and provincial levels, each feeding into the other iteratively. At national and regional levels, such learning forums can be convened annually. Apart from sharing the internal improvements, the learning forums could also be used to share knowledge emerging from other sustainable agriculture practices in the country and beyond. This would make the learning forums a meeting point to make sense of how the global developments are affecting the local. Sustainable agriculture technology sharing could be another function of the forum. An example could be how others are adapting to climate change, or better tools. Such learning forums could also feed into and be informed by similar NGOs and research initiatives. At the same time, the forums could be periodically used to bring scientists and farmers together to tackle local problems and engage in Participatory Technology Development. Such a process will ensure a more strategic growth and development of the practice at various levels.

10.2.3.2 Develop and disseminate appropriate learning materials

Being primarily concerned with teachers and pupils and their schools, SCOPE might need to pay attention to the lack of learning materials of Permaculture in the schools where it operates. The study revealed that they are not suitable for pupils, nor are they for farmers. SCOPE could accelerate the adoption of Permaculture by ensuring that there are appropriate learning materials. This would mean developing resource materials, such as field guides, manuals and posters that are suited to farmers who are targeted. It would also mean preparing some of them in the vernacular language. The development of such materials may need to provide for their revision as farmers give feedback and new knowledge emerges. The materials should make an attempt to address the why of the practice, not only the how so as to provide deeper knowledge which will allow practitioners to justify choices they make. The use of local examples, which are in or close to their contexts, would increase the relevance of the resource materials.

10.2.3.3 Review cluster system

SCOPE needs to investigate the full implications of the cluster system on the workload of Permaculture teachers who must teach other school subjects. Based on this, SCOPE might then need to determine, together with teachers concerned and school heads, what the most appropriate levels of input and timing are. A related area which SCOPE may investigate is how Permaculture farmers in the community could also be resource people in the cluster

system, utilising the concept of farmer to farmer extension. For example, when new Permaculture schools tour the old, the visits could be extended to farmers' fields and gardens as sources of learning and inspiration.

10.2.3.4 Support the implementation of accredited training on sustainable agriculture

One of the key issues raised by farmers is that there are hardly any competent Permaculture and sustainable agriculture trainers supporting farmers. One of the key reasons for this lack is the absence of long term courses in Permaculture and related sustainable agriculture practices. Their absence is linked to there being no resources to support such training, coupled with the absence of appropriate accreditation mechanisms. While this strategic gap cannot be addressed by SCOPE alone, SCOPE can initiate dialogue on the subject with responsible institutions. SCOPE should have an interest in this because its efforts at lower levels in schools and downstream with farmers through schools would be supported if accredited long-term courses in Permaculture and other sustainable agriculture practices could be established. One of the options would be to revive, review and implement the PELUM College curriculum, which is already registered with the Ministry of Higher Education albeit at certificate level only.

10.2.3.4 Engage the Ministry of Education for curriculum review to include environmental education

SCOPE was developed to promote "sustainable land use of school and college grounds and homesteads in the surrounding communities" and to promote the integration of ecological principles into the curriculum (Nyika, 2001, p. 125). The study showed clearly how St Margaret School and its surrounding communities had incorporated Permaculture in the grounds and homesteads. However, there was no evidence that SCOPE had achieved much in mainstreaming of ecological principles in the school curricula. This is why, for example, Permaculture teachers were torn between time for the core curriculum and time for Permaculture. The recommendation therefore is for SCOPE to look for ways of lobbying the relevant authorities to mainstream environmental education against the background of Education for Sustainable Development and other policies.

10.2.4 Recommendations for sustainable agriculture farmers

10.2.4.1 Collectively develop locally relevant tools for assessing the performance of practice

The study established that sustainable agriculture farmers have an interest in meeting social, ecological and economic needs through their agricultural activities; it is therefore important that any learning and development activities pay special attention to all these simultaneously. In order to do this, it would be useful to develop a tool that allows the farmers themselves to assess the performance of their practice from time to time to identify areas needing improvement (see Tool 9.4.1). It would be even better to develop it collectively and

continuously improve it with time – as part of the improvising process which is typical in practice.

10.2.4.2 Establish local learning forums

One of the main constraints to farmer learning is associated with the absence of Farmer Learning and Development Forums (see Tool 9.4.7) to drive local learning processes in a manner that taps into the distributed cognition of the farmers in the area as well as of other people such as agricultural, business and environmental experts. The recommendation is that farmers establish learning forums in their respective areas to share innovations, knowledge and experiences; to reflect on the same; to build a voice and lobby for the improvements of policies that work against them; to obtain input from other development actors in matters of interest; and to connect and coordinate local learning and development processes. Another important purpose that such forums would serve is that of setting an agenda for what research is needed and who could contribute to this. Such a forum would „funnel the drizzle“ of farmers working in isolation and serve to improve the collective and relational agency of farmers. Such a forum would also resonate with the observation of one of the MFS facilitators: “A man is a man because of other men”, which here could be translated to “A farmer is a farmer because of other farmers and other people”.

10.2.5 Recommendations for SAQA research programme

10.2.5.1 Consider different knowledge types in the learning of agriculture

The research has shown that deliberations in sustainable agriculture education, which is a form of environmental education for sustainability, are reflexive and the meeting point of different knowledge systems and sources: traditional and western, lay people and experts. It is not about one „hill“ of knowledge overshadowing the other, but rather concerned with how each can serve as catchment of ideas and thoughts that can be used to cultivate the land between. That, in essence, summarises what may constitute sustainable agriculture cognition (see Section 9.2.4). The significance of this conclusion is that curricula for both workplace and formal learning need to incorporate these different forms of knowledge from different sources in order to improve the practice continuously. In the case of farmers who may not have a formal learning place, there is need to revive or encourage the setting up of mechanisms for them to learn among themselves as well as from experts on different and related fields.

10.2.5.2 Factor in the significance of learning time in sustainability practices

The research also underscored the central importance of time in enabling the farmer (and the trainer) to master a practice and appropriate what they need, and be confident to experiment and innovate. This finding resonates with one of the three laws of dialectics developed by Macey (2000), *the law of the transition of quantity into quality*, which argues that quantitative

change leads to qualitative change – the more put into learning, the higher the likelihood of quality learning. SAQA and other bodies interested in education and sustainability may want to re-consider the amount of time that is invested in the learning of sustainability in agriculture and other disciplines with a view to increasing it. The study suggests that most of the training in Organic Farming and Permaculture in South Africa is offered at NQF Level 5 and below which is not adequate for developing the practice reflexively. The introduction of training in different forms of sustainable agriculture beyond NQF Level 5 in South Africa appears imperative. Government and NGOs that are promoting sustainability in agriculture may also need to consider helping farmers to set up structures that allow for continuous lifelong learning, that is, Farmer Learning and Development Forums.

10.3 CONCLUSION

10.3.1 Implications on change-oriented learning and sustainability practices

The intervention research helped participants to develop model solutions to some of the problems they are facing in workplaces, including the invisible dimensions. They appreciated the expansive learning process and are likely to work with these processes of collaborative engagement beyond the intervention workshops as shown in the feedback sessions. The workshops improved their relational and collective agency and set the ground for increased agency. The process also revealed that the *nature of practice* influences the learning process.

The results of the research resonate with O’Donoghue’s (2007) idea of the recent emergence of environmental education that is a more reflexive combination of knowledge systems that also take special account of spatial considerations “as open processes of situated re-search and deliberative meaning making interaction, notably reflexive social learning processes that are planned and undertaken in response to risk within a community of practice” (p. 141).

This research project has demonstrated and developed some of the key design elements in a wider research programme focussing on change oriented learning and sustainability practices (Lotz-Sisitka et al., 2008). It has demonstrated how a combination of historical analysis, analysis of practices, CHAT analysis and process, together with critical realist causal analysis can provide insight into change oriented workplace learning and sustainability practices in ways that are developmental and expansive of the learning processes themselves. This begins to illuminate a „new genre“ of participatory research in environment and sustainability education in southern Africa, allowing research to be practice and change-oriented, while rigorous and analytic at the same time. Through this study several tools for facilitating CHAT-based learning and research were also developed.

The study contributes in-depth insight into participatory research and learning processes, especially within the context of people-centred learning and innovation in the agricultural

development arena. It provides empirical and explanatory insight into how change oriented social learning can emerge, and be expanded in Education for Sustainable Development, explaining learning and change relationships in three sustainable agricultural practices. It also provides learning and extension tools to work with contradictions that arise from intentionality, experience, context and history in farming and training activity systems. Its key contribution lies in providing in-depth insight into mobilisation of human agency and reflexivity in change oriented sustainable agriculture learning and development, processes that are critical for responding to contemporary socio-ecological issues and risks. In the next subsection (see Section 10.3.2) the study positions itself into the future and looks back at history to explain changes that would have taken place through expansive and social learning processes in sustainable agriculture. In a sense, the study concludes by defining the zone of proximal development for sustainable agriculture in the next two generations.

10.3.2 The history of the future of sustainable agriculture

Between Martin Luther King Junior's „I have a dream“ speech in 1963 and the realisation of that dream, which is encapsulated in Obama's „Yes we can“ speech and his inauguration as the first black American President in 2009, lies the zone of proximal development for an American democracy. Between Kwame Nkrumah's vision of an independent Africa and the realisation of democracy in South Africa in 1994 as the last African country to become independent, lies the zone of proximal development for an African renaissance, which finds expression in such structures as the African Union and the New Partnership for African Development (NEPAD) and the young United States of Africa. And between Jan Smuts' articulation of holism in management and development – where opposites are reconciled and harmonised in the whole, and the prevalence of agro-ecological practices lies another form of zone of proximal development. The „long walk to freedom“ to democracy, to independence, to holistic management and practices, resides along a zone of learning and development – a zone defined by a collective, not an individual.

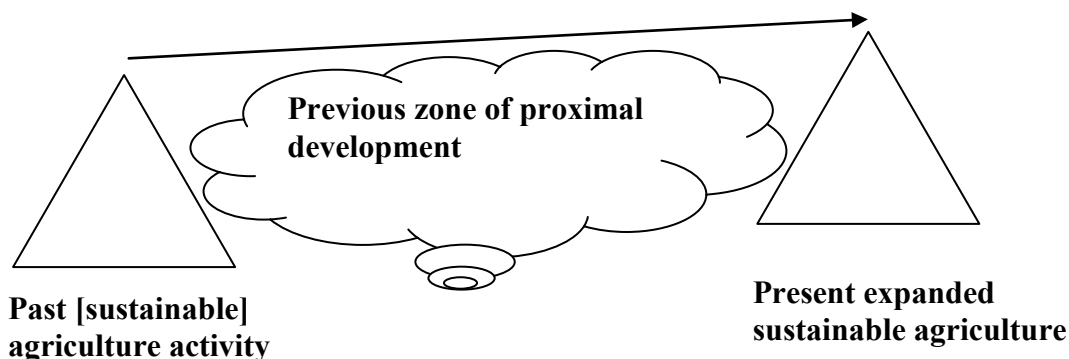


Figure 10.1: Sustainable agriculture zone of proximal development

I devote the concluding paragraphs of the thesis to characterising the zone of proximal development between current sustainable agriculture practices and future sustainable agriculture practices (see Figure 10.1), which will become history in the future. In doing that, I am also suggesting a „*new genre*“ of *agricultural cognition* that is more embracing in terms of knowledge sources. I use the activity system concept and the associated expansive learning model to help me describe this zone because it enables me to talk about the kind of object or vision for sustainable agriculture that are envisaged and the tools that would be necessary to reach this. It allows me to talk about what contextual changes in the ecological and social rules in the community and in the division of labour will be necessary. It allows me to make suggestions about production of the outcomes, their distribution and exchange, as well as their consumption. Finally, I use CHAT with a critical realism under-labouring because it allows me to speak about the broader contextual developments that have a bearing on sustainable agriculture. The expansive learning model allows me to talk about what happens between one form of activity system and its successor.

Drawing on the history of agriculture (Pretty, 1999; Scoones et al., 2008; Mukute, 2010) in the past and the history generated in this study (see Chapters 1 to 8), I speak about what I see as the *emerging history of the future for sustainable agriculture* by imagining a scenario. It is year 2072, exactly 100 years after the famous and first World Conference on Environment and Development; 93 since the Peasant’s Charter at the World Conference on Agrarian Reform and Rural Development; 80 after the Rio Conference and 70 after the World Summit on Sustainable Development that was held in South Africa. It is about 60 years since the UN Decade of Education for Sustainable Development, and 40 since green jobs, green services and products became an imperative in all spheres of life across the world. It is a mere 30 years since the United State of Africa’s Food and Agriculture Department adopted sustainable agriculture; followed by Asia and Latin America and the rest of the world within a short 20 years.

Between the surge of sustainable agriculture and the fall of conventional agriculture, lies the zone of proximal development of the dominant form of agriculture today. Within this space, several, multi-layered transformations happened in different places and at different times, all of which were coordinated towards an agriculture that produces enough safe and nutritious food; that generated economic viability for the farming populations and professionals; and at the same time improved farms, not as machines for production but as living entities whose productive potential was multiplied and ecological services enhanced alongside improved access to land by the formerly poor and marginalised, better distribution of costs and benefits of agriculture and creation of gainful employment. In telling this history, I remain conscious of the fact that the new agricultural practice, the new activity system is not the only solution. I do this fully aware that soon, new challenges and contradictions will emerge and will create

the need for another zone of proximal development in the same way Africa's independence created the need for the democratisation of the new democracies; or the Obama administration had to attend to global environmental matters and deal with the notion of terrorism in more critical, just and sustainable ways.

Today, in 2072, sustainable agriculture has resolved contradictions which arose from the privileging of environment over social and environment over economic – and those of conventional agriculture which put profit over people, and economics over the environment. Sustainable agriculture can produce enough not only for household and local needs but also enables the creation of new jobs, the development of local, national, regional and international industries. It has brought prosperity, environmental sustainability and social equity to many places. It has made vast progress in capturing and sinking the notorious excessive human-generated carbon which induced climate change. It is an agriculture built on the distributed cognition of farmers, agriculturalists, environmentalists, nutritionists, economists and sociologists deliberately co-constructed over the last few decades. This agriculture has recharged water tables, which is why the streams and rivers of much of east and southern Africa that had gone dry in the late 20th and early 21st century are now flowing again, perennially. This agriculture is taking care not to pollute the biological diversity of neighbouring ecological systems, not to pollute water bodies. The coming together of the „browns“ and „greens“, the authentic engagement of government, civil society and the corporate sector – brought together opposites into dialectical relationships, creating spaces for reflexivity and expansive learning within and beyond agriculture.

The growing consciousness about the need to eradicate hunger, to take care of the environment and to be democratic across practices and places, religions and races, swelled enough to direct the efforts of governments towards a better world. The ascendancy of sustainable agriculture, which was built on different and related practices such as Permaculture, Organic Farming and the Machobane Farming System as well as on conventional agriculture, was accompanied by technological advancements. The rise of the hydrogen economy and the harnessing of solar energy from the deserts of Africa at a time when oil supplies began to fall dramatically reduced carbon emissions. The Cuban agricultural revolution of the 1990s, which was in itself inspired by a crisis of fossil fuel, served as a powerful example, when oil shortage became universal in the 2020s. Government all-out support of farmers who were converting to sustainable agriculture marked the turning point in the history of sustainable agriculture. Most African countries, the continent that was the first to be hardest hit by oil shortages, adopted sustainable agriculture ahead of the rest. Because the policies touched on and stimulated supportive tools for sustainable agriculture, appropriate curricula and suitable pricing policies, this made more people, especially the youth take on agriculture as a profession of first choice and made farmers see the true value

of their contribution to humanity. It has been pointed out in this study that in southern Africa in 2010, agriculture is seen as a low status profession and sustainable agriculture is „doubly stigmatised“ (Mukute, 2010). The table below (Table 10.1) is a condensed picture of the surges and falls of three forms of agriculture over several centuries and the place of farmers in each dominant agricultural phase.

Table 10.1: Telling the tale of the longer walk

Main form of agriculture	Upswing	Downswing	Place of farmers
Traditional agriculture characterised by intergenerational learning	<ul style="list-style-type: none"> Addressed the survival needs of populations, provided ecological services and minimised risks; and created some surpluses Domesticated plants and animals and improved them Inspired human settlement. (sedentary) 	<ul style="list-style-type: none"> Failed to cope with increased demand for industrial raw materials and food needs of increased populations Disrupted, stigmatised and marginalised by formal schooling and the rise of conventional agriculture 	<ul style="list-style-type: none"> Researchers and innovators Disseminators of knowledge generated Consumers of their own knowledge
Conventional agriculture characterised by technology transmission learning	<ul style="list-style-type: none"> Maximisation of production, drawing on scientific knowledge, abundant fossil fuels, chemical fertilizers from excess ammonia and pesticides from DDT from Second World War Biotechnological advancements of the late 20th and early 21st century 	<ul style="list-style-type: none"> Decline in supply of and increase in price of non-renewable fossil fuels Creation of ecological risks and the unfair distribution environmental costs Famine induced by lack of external agricultural inputs derived from oil 2029 financial crisis 	<ul style="list-style-type: none"> Research objects Consumers of science knowledge Loss of indigenous knowledge and traditional practices
Sustainable agriculture characterised by expansive people centred, co-learning, pronesis and post-normal science	<ul style="list-style-type: none"> Optimisation of ecological, social and economic considerations in agriculture (<i>the triple bottom line</i>) Inter-disciplinary and trans-disciplinary approach to agriculture Government, civil society and corporate sector collective investment in agriculture 	<ul style="list-style-type: none"> Yet to emerge 	<ul style="list-style-type: none"> Farmers are researched with Farmer as co-creators of knowledge They actively participate in agriculture research agenda setting Cognitive and reflexive justice

Continuing with looking back from 2072, from the previous Table 10.1 it is evident that the developmental germ cell –the model of the new activity system, that is, the genetic make-up of the current sustainable agriculture practice can be traced back to the joining of economic, socio-political and ecological dimensions of agriculture and rural development, in response to the double bind created by the oil peak and global famine in 2020s. In short, the *ancestry* of our sustainable agriculture practice of today can be traced right back to the solutions that sought to address famine, ecological and social contradictions. This has culminated in the

simultaneous optimisation of the social, economic and ecological objects of sustainable agriculture. The main thrust of learning has also evolved over time, from the intergenerational learning which characterised traditional agriculture, to knowledge transfer in conventional agriculture to co-learning and expansive learning in the current sustainable agriculture wave.

Today, in the imagined year of 2072, sustainable agriculture is bringing more and enough food for the home and industry: food abundance exists side by side with sustenance of the productive potential of land and happy homes with good access to healthy and nourishing food. In the past, in the early part of this century, sustainable agriculture was of too small a scale to do what it can do today. It was under-resourced; under-tooled, and under-researched because the real attention went to the now discredited „conventional agriculture“, which produced high yields using high inputs and had a strong capitalist orientation that made the rich, richer; impoverished the soils; contributed to global warming and polluted water bodies and increasingly marginalised the farmers and other producers, as the corporate sector took over more and more control of the agricultural production chain. It was the credit crunch of 2009 and the second and more severe one of 2029 which forced governments across the world to question and change the free-market economy and allowed a more tripartite and even distribution of power between civil society, government and the corporate sector. This was accompanied by a better global economic order with narrower gaps between the rich and the poor nations, and within nations. For example, the Farmer Learning and Development Forums and a set of start-up tools, first pioneered in 2008-2010 in doctoral and post doctoral research projects were developed in the 2030s across Africa. By the 2030s farmers had been empowered to direct learning efforts towards their needs, many of which were context-dependent but most of which also required critical and emancipatory analyses and wider systemic engagements. The subsequent injection of material and intellectual capital from different fields of learning nourished the growth of the sustainable agriculture that we experience today.

Today as we head towards the end of the twenty first century, unlike the past, sustainable agriculture feeds on and develops different knowledge systems across the globe: the formal and the informal; the global and generic as well as the local and context-specific; the farmer's and that of the specialist, without seeing one as better than the other. The practice of sustainable agriculture has been consolidated through bringing together the different strengths of the various practices of the past such as Organic Farming, Agro-forestry, Permaculture, Holistic Management; Conservation Agriculture; Participatory Technology Development and the Machobane Farming System. The practice has also drawn heavily on what was considered to be „conventional agriculture“, incorporating the rigour of what was once seen as western science, drawing on the wisdom of local knowledge systems. Mechanical and

biological tools, *primary artefacts*, which once lacked and undermined the development of different forms of sustainable agriculture, have since been developed and made widely available – efficacious biodegradable pest and disease controlling drugs; fertilizers that do not pollute water bodies; and a wide range of crop and animal genetic diversity, all using far less carbon-based means of production. *Secondary artefacts* have also changed: for example, grazing management, integrated in sustainable agriculture throughout the world, has converted grazing lands that were marked with many bare patches and dead standing organic matter into well-grassed pastures, converting solar energy which becomes available to mankind, through photosynthesis. Consequently water movement on pastures has been slowed down, allowing it to infiltrate, building the water table and re-invigorating springs that had gone dry for decades. Many of the conceptual and material tools were re-invented or appropriated from other fields of development. More young people are practising sustainable agriculture and teaching others at a scale never imagined possible in the past. High risk tools such as GMOs are tested rigorously before they are adopted. Different places and different people that need different tools now have access to them. Learning materials are available in local languages.

Today, unlike the past, the majority of farmers are below 40 years of age. The negative perception of agriculture which gripped the last two to three generations has lost its sway. „Agricultural and sustainability consciousness“ define the identities of today’s crop of farmers, both young and old, and society gives more respect to nature and to agriculture as a practice and as a profession. Youths see agriculture as a „cool calling“. Present day farmers have created places and times – Farmer Learning and Development Forums – where they regularly learn from one another, share problems and progress, engage with researchers and educators. Farmers are able to not only innovate among themselves but are setting the bulk of the agricultural research agendas. Power relations between farmers and other stakeholders in their field have substantially shifted towards more equal partnerships and mutual respect. This shift has been accompanied and supported by an increased accumulation of cultural capital among farmers, an expanding social capital and above all an improved economic capital which has re-defined the configuration of the terrain in which they operate. The concept of time in crop farming has shifted from being seen in annual seasons to what Seppänen and Koskimies (2002) termed „farming across the years“.

Today, in 2072, local, national and international policies are supportive of sustainable agriculture, where the bulk of government budgets on agriculture stimulate *responsible production processes and citizenship*. Sustainable agriculture is backed up by sufficient and regular research input. Agricultural land policies enable the ordinary male and female farmer to access land and they have the *incentive* to look after it for future generations, whether it gets passed on within the family or not. School and college *curricula* are inspired by

sustainability which combines the ecological, social and economic. Educational researchers have lifted their focus to look at both practice and theory of local and universal knowledge giving birth to new conceptualisations of quality and relevance, generating cognitive justice (Visvanathan, 2006), and reflexive justice (Lotz-Sisitka, 2010). The *natural and social conditions* of different places are today the main determinant of what may be raised in the true spirit of *sustainable development*. We have witnessed a 0.5 % decline in temperature over the last three decades. The local and *global pricing system* has encouraged society to engage in responsible agriculture. Trade and exchange *regulations* were collectively developed by world leaders who represented each part of the world – the regional blocks, away from the Group of 8 which put the thoughts and feelings of the developed countries ahead of the rest. Herein lies what Beck (2000) called globalisation from below, through *sub-politics*.

Beck's risk society at the turn of the century has been succeeded by our responsible society. Children are born into responsible societies and take responsibility for looking after themselves, their environments. It was as far back as the 2030s that the „throw-away society“, which generated significant waste and considerable poverty, began to wane. Consumers of agricultural produce across the globe are happy with the quality of the produce and converge every year to celebrate good harvest according to the seasons of their locations.

Men and women alike have moved into the field of agriculture. The „middleman“ no longer dictates what farmers must pay. The buyers no longer set prices for produce. There are teams of representatives working out fair distribution of costs and benefits along the entire agricultural production and marketing chain. The vertical and horizontal differences of exchange values have been narrowed and occupants of the different spaces have become more mobile and satisfied at the same time. Little by little, *qogelela*, the world has changed for the better as phronesis, knowledge concerned with good judgment, politics and ethics, has gained currency worldwide in a way that must please many of the wise men and women who graced the world in the past, including Aristotle to whom the notion has been attributed.

Whereas in the past it was the talk of anti-terrorism and the evil axis, today we talk of a global family defined by what Adler (2001) must have meant by „collaborative interdependence“; climate change discourse has been superseded by our concern for an aging global population; the once envisioned African renaissance has catapulted the continent to the same competitive levels as the rest of the world. King's dream has crossed beyond America, as has Nkrumah's beyond Africa, Gandhi's beyond India and Smuts' beyond South Africa. Our new economic order has brought far greater equity within and between nations, thanks to the concerted efforts of civil society over the last few decades. This world is probably what they had in mind at the 2002 World Summit on Sustainable Development, when the World

Social Forum activists claimed “Another world is possible”. Isn’t it amazing – how the thoughts and deeds of the long dead live in us, in our practices and tools, as will our thoughts and deeds of today live on in the practices and tools of the future?

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Appendices

Appendix 1: Sample letter requesting partnership in research

--- On Thu, 24/7/08, Mutizwa Mukute <mmukute@yahoo.co.uk> wrote:
From: Mutizwa Mukute <mmukute@yahoo.co.uk>
Subject: Request to partner with RSDA in a research journey
To: "Me' Thulo" <rsda@lesoff.co.za>
Cc: "Moshe Tsehlo" <tsehlo@yahoo.com>
Date: Thursday, 24 July, 2008, 10:13 AM
Dear Me"Thulo

Regards from Grahamstown. It was great working with you over the last 10 years or so. I write to ask for space to engage you in the PhD research work which I propose to start working on this year.

The focus of my study is to look at how farmers are learning sustainability in agriculture and how this learning can be expanded. Since you are both working with the Machobane Farming System, I thought I could work with you as one of the two organisations, the other one, will hopefully happen with Machobane Foundation. I would be particularly interested in the learning that happens between your organisation and the farmers that you work with. I would suggest a group of 8 farmers who normally learn together.

The planned stages of the research are:

- 1. Literature review of what you have been doing the community of farmers*
- 2. In depth interviews: one with a promoter from your organisation; one a farmer leader and one with a practising farmer;*
- 3. One focus group discussion with practising farmers*
- 4. Observation of farmers learning through doing (3 sessions or so)*
- 5. One workshop to share my analysis of the above with farmers as well as for them to identify and analyse current limitations of the Machobane Farming System*
- 6. One workshop to develop tools to address some of the limitations*
- 7. One workshop to critique tools developed by another group working on Machobane Farming System.*

The process will probably be spread over 3-6 months and might take up to 10 days in terms of the time of the farmers. We would negotiate the most suitable times. I would propose that we have an initial meeting in early September to discuss the details further.

I am attaching a letter which outlines the research process in greater detail.

Looking forward to hearing from you,

Mutizwa

Appendix 2: Sample letter requesting feedback and thanking participants

*Rhodes University Environmental Education and Sustainability Unit
P O Box 94
Grahamstown 6140
South Africa
Cell: +27-714015717*

6 September 2008

*Messrs Yahaya, Manyati and Mugauri
St Margaret Primary School
P Bag 2115
Hwedza
Zimbabwe*

Dear Sirs

Thank you very much for affording me the opportunity to interact with you and to learn about how you are promoting and practising Permaculture. I was greatly impressed by the levels of your achievements and commitment and I can only wish you the best. I learnt a lot from you during the interview and also hope that you benefited in some way.

I typed the conversation we had based on the notes that I took. Kindly go through the record of the conversation and correct any areas where I could have misrepresented the facts. If there are gaps and/or errors of omission, please do not hesitate to fill them in. I would like to keep the final and revised version of the group interview as the true record of our conversation, so it will be important for you do be thorough with your comments and editing. In addition, if you have had further reflections on the subject, kindly share them with me in writing. I believe that SCOPE can assist in passing on the information to me.

Mr Manyati, thank you very much for accompanying me to the farmers that you work with.

It would be great if we could keep the conversation alive between meetings. As indicated earlier, I intend to come back and follow up on our conversation in the next few months and would very much like to observe some of your Permaculture workshops with farmers and other groups of learners.

Wishing you all the best

Mutizwa Mukute (PhD Student)

Appendix 3: Data generation tools

Appendix 3.1 Checklist of questions for interviews with farmers

This questionnaire forms the basis of a conversation between the researcher and a farmer practising sustainable agriculture. Its format is informed by dimensions of the activity theory. It intends to generate data on how and why farmers have learnt and practice sustainable agriculture. This will be contextualised in the family, village and country. At the same time, the interview is intended to establish the current contradictions in the activity system and trace their root causes. This information will be used in subsequent change laboratory workshops to single out key learning issues among farmers in their different contexts and how they may be overcome. Two farmers will be interviewed per case study (sustainable agriculture practice). In-depth interviews will take place after document analysis and before focus group discussions in each case study.

A. Background

- *Please tell me about yourself and your farming history.*
- *What is your past experience with Permaculture/Organic Farming/MFS?*
- *What is your understanding of Permaculture/Organic Farming/MFS?*
- *Why do you practice Permaculture/Organic Farming/MFS?*
- *What is your understanding of sustainable agriculture?*
- *In what ways does Permaculture/Organic Farming/MFS address sustainability?*
- *Where do you practice Permaculture/Organic Farming/MFS and how?*
- *What proportion of farmers in your village practice Permaculture/Organic Farming/MFS?*
- *How do you compare sustainable agriculture and modern agriculture?*
- *What other kinds of sustainable agriculture are practised in your village?*

B. Learning

- *How did you and do you learn about Permaculture/Organic Farming/MFS?*
- *Who supports the learning of Permaculture/Organic Farming/MFS and in what ways?*
- *What are the important tools, techniques and concepts used in Permaculture/Organic Farming/MFS?*
- *Who developed these artefacts, when and how have they been modified over time?*
- *What limitations do you see in the artefacts in addressing different sustainability issues in your agro-ecological, social and economic environment?*
- *What constraints do you face in the way you learn Permaculture/Organic Farming/MFS?*
- *How do you think the constraints and limitations that you face could be minimized or overcome?*
- *How do you learn best?*

C. Farmers as subjects

- *What different types of farmers in your village practise sustainable agriculture?*
- *What differences in learning and practising Permaculture/Organic Farming/MFS have you experienced with fellow farmers and how have you resolved some of them?*
- *What proportion of farmers practising Permaculture/Organic Farming/MFS in your village is: men/women?*
- *How has HIV/AIDS affected the village of farmers Permaculture/Organic Farming/MFS in your community?*

D. Agriculture as the object

1. *What new challenges are you facing as a Permaculture/Organic Farming/MFS farmer?*
2. *On a scale of 1-10 score (and give reasons for each score) the following:*
 - a. *The extent to which Permaculture/Organic Farming/MFS meets your economic needs;*
 - b. *The extent to which Permaculture/Organic Farming/MFS builds the soil, improves water availability and retention, reduces soil erosion and improves agro-biodiversity; and*
 - c. *Enhances your self-reliance as a farmer?*
 - d. *Your overall ability to withstand and overcome social, economic and environmental changes taking place in your area.*

E. The community and division of labour

- *What roles do members of your family play in agriculture?*
- *What problems have/are you facing in role allocation?*
- *Why are you experiencing such problems?*
- *Who plays what role along the agricultural production and distribution chain in your community?*
- *What tensions and challenges exist between the various actors along the agricultural chain?*
- *Why do these tensions exist?*

F. The farmer and the regulatory environment

- *What local and national regulations have a bearing on agriculture?*
- *Which of these policies do you find most constraining and in what ways?*
- *What has been your role in their formulation or development of these policies?*
- *What do you think could be done to improve the policy formulation, awareness and adoption processes?*
- *How do the policies affect your relationship with different groups of people along the agricultural production chain (researchers, fellow farmers, extension workers, traders, input suppliers, consumers, youths, other kinds of farmers)?*

Appendix 3.2: Checklist of interviews with sustainable agriculture facilitators

This questionnaire forms the basis of a conversation between the researcher and a development practitioner. Its format is informed by dimensions of the activity theory. It intends to generate data to reveal learning processes that are taking place in sustainable agriculture workplaces, from the perspective of a development practitioner. At the same time, the interview is intended to establish the current contradictions in the activity system and their root causes. This information will be used in subsequent change laboratory workshops to single out key learning among issues farmers in their different contexts and how they may be overcome. Two development practitioners will be interviewed per case study (sustainable agriculture practice). In-depth interviews will take place after document analysis and before focus group discussions in each case study.

A. Background

- *Please tell me about your history as a development practitioner.*
- *What is your understanding of Permaculture?*
- *Why do you promote Permaculture?*
- *What learning processes did you undergo before you become a promoter of Permaculture?*
- *What learning have you experienced during your work life as a promoter of Permaculture?*
- *What is sustainable about Permaculture?*
- *What do you see as the limitations of Permaculture?*
- *How are these limitations being addressed and by whom?*
- *What do you perceive as the greatest potential of Permaculture and how can it be exploited?*
- *What other forms of sustainable agriculture do you promote and how do they relate with Permaculture? Insert space before B.*

B. Farmer learning (Tools)

- *How do you facilitate the learning of Permaculture among farmers?*
- *How else do farmers learn about Permaculture?*
- *What knowledge challenges have you encountered in promoting Permaculture?*
- *What contextual factors have enabled the learning and practising of Permaculture among farmers in the country (economic, ecological, socio-political and technological)?*
- *What contextual factors have or are constraining the learning and practising of Permaculture in your country?*
- *What is the role of the farmer in the growth and development of the Permaculture sustainable agriculture practice?*
- *In what ways do the relationships of farmers learning together affect the extent to which they learn?*
- *How do you provide for individual and group farmer learning and what are the limitations of each?*
- *What key learning and knowledge creation issues do you face in promoting Permaculture? Why?*
- *How could you improve your role to enhance more effective farmer learning?*

C. Permaculture and Sustainability (Object)

- *Using a scale of 1-10, please rate the performance of Permaculture in the communities you have worked*

	Score	Explanation of score
Ecological sustainability		
Economic sustainability		
Social sustainability		

- *How can the sustainability issues be addressed?*
- *What do you see as the weak links in Permaculture learning and practice?*
- *What are the new issues in the operating environment that Permaculture should respond to and how?*

D. Rules/Policies

- *What are the local and national policies that affect Permaculture learning and practice and how?*
- *What regional and international policies affect the learning and practice of Permaculture and how?*

E. The community and division of labour

- *How are roles allocated in farming households, who does what?*
- *What problems are encountered in the distribution of work among farming households?*
- *What is the source of the problems?*
- *Who plays what role along the agricultural production and distribution chain in the smallholder farming sector?*
- *What tensions and challenges exist between the various actors along the agricultural chain?*
- *Why do these tensions exist?*

Appendix 3.3: First layer document analysis

The first layer of document analysis will be carried out at the beginning of the research process in the exploratory phase. It will focus on understanding each of the three selected sustainable agricultural practices: Permaculture, Machobane Farming System and Organic Farming. It will help the researcher deepen understanding of the conceptual, contextual and historical dimensions of each practice.

- *Origin, motive and history of agricultural (Permaculture, MFS, Organic Farming)*
- *Key distinguishing features of the agricultural practice*
- *Main thinkers/innovators and promoters associated with the practice*
- *Mediation tools used in the socialisation of the practice*
- *Sustainability dimensions explicitly addressed by the practice in its theory*
- *Sustainability gaps in the current practice observed in the country*
- *History and extent of use of the practice in the country. Reasons.*
- *Challenges that have been encountered in learning and implementing the practice. And reasons for this.*
- *Values and principles associated with the practice*
- *Potential of the practice*

Appendix 3.4: Second layer document analysis

The second layer of document analysis will be carried out near the beginning of the research process in the exploratory phase. It will focus on understanding how each selected case has been and is learning and practising a sustainable agricultural practice. It will help the researcher to establish sustainable agriculture learning in retrospect and will help historicise and contextualise each practice per case study. It will take place before focus group discussions.

- *History of the community practising the sustainable agriculture*
- *History of the institution promoting the sustainable agriculture*
- *Other forms of sustainable agriculture being practised by farmers in the community*
- *Other forms of sustainable agriculture being promoted by the institution in the community*
- *Extent to which the agriculture is practised*
- *The processes of learning that have been employed in sharing and developing the practice at the centre and in the field (communities)*
- *Evidence of knowledge creation at either institutional or farmer levels*
- *Farmer evaluation of learning experiences*
- *Institutional reflections on the practice and its learning*
- *Contradictions and limitations in the learning or practising of the agriculture and reasons for these.*

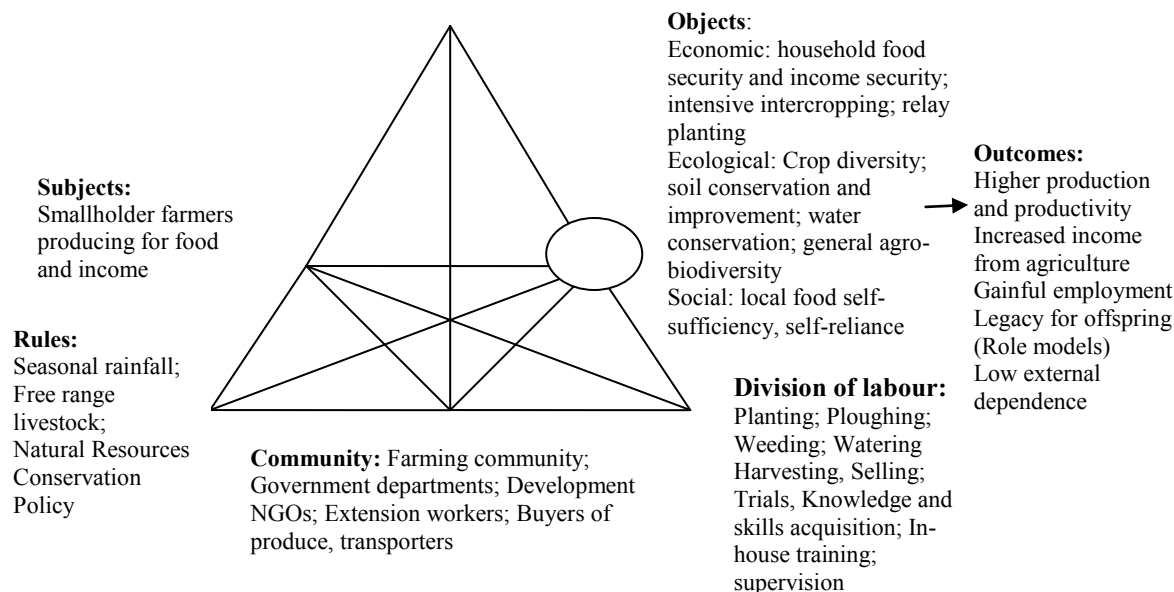
Appendix 3.5 Tool for observing sustainable agriculture practices

What to observe	Questions to ask	Notes
Subject, object tool relationship	What is being done? Why is it being done? Who is doing it?	
Time and space	Where is the practice done? Why? For how long has it been done? What kind of activities take place and when?	
Purpose and practice relationship	Is what is being done addressing the purpose for which it is being done?	
Evidence of experience	What improvements have been made in the practice? What evidence is there?	
Use of knowledge	How do farmers know what to do? What else do they need to know?	
Contradictions and uncertainties	What is enabling and constraining the practice? What are the strengths and weaknesses of the practice?	

Appendix 4: Interview analysis tools

Appendix 4.1: Interview analysis tool (preliminary), example based on analysis of a group interview with farmers in Zimbabwe

Mediating artefacts: Parents, fellow farmers, spouses, government & NGO extension workers; Gardens, fields, farmer markets; draught power, water pipes, water pumps, planting materials; Experiments, monitoring, practising, copying and comparing; look and learn, learning workshops.



Description of tension or limitation	Location of element in the activity system
<i>Mu: In the past we were made to believe that crops cannot grow properly if you do not apply chemical fertilizers. PC taught us that it is possible and desirable to use organic fertilizer, which also improves the soil.</i>	<i>Level 4, Tool producing activity</i>
<i>[Did not see any nitrogen fixing plants though] Researcher observation in the citrus dominated orchard, where maize is planted as part of agro-forestry</i>	<i>Level 1, Tools</i>
<i>Mu: We planted bananas as a way of protecting the river bank, when in fact the government regulations were that we should not plant anything within a certain distance from the river bank. In 1992, the Natural Resources Board officers fined us for breaking the law. However, in 2004, the same authority awarded us a national prize for effective conservation practices for looking after the same river bank using the same methods for which it had fined us.</i>	<i>Level 4, Rule producing activity system</i>
<i>AB: You see, it is like in the past there were n'angas assisting people who had problems, nowadays we have mapositori. If you remain as the only n'anga, you can feel so isolated that you begin</i>	<i>Level 1, Subjects</i>

<i>to lose confidence in what you are doing.</i>	
<i>Mu: There is one kind on investment which is very important but which people tend to undervalue. This is investment in relationships and socialising. It is from these relationships that we learn to move forward. You came here. I establish a relationship with you. I learn from you and you learn from me. Sometimes we must spend must in order to learn, spending it to travel and meet such people</i>	<p><i>Level 1, Object (Social sustainability vs economic sustainability)</i></p> <p><i>Level 2, Subject-Object relationship and resource allocation</i></p>

Learning processes

- a. Learning by connecting what you know and what you experience to create the spark;*
- b. Learning from talking to other people, especially successful farmers;*
- c. Learning from parents who may serve as role models;*
- d. Learning by copying and comparing;*
- e. Learning from doing, implementing what is learnt;*
- f. Learning from trying new things, even when they go against popular thinking;*
- g. Reinforcement of practice through confirmation and popularisation by others who may be seen as more credible;*
- h. Learning through practising new techniques and growing new crops;*
- i. Learning by observing and monitoring what works and what does not;*
- j. Learning by experimenting; and*
- k. Learning by questioning and challenging.*

Appendix 4.2: Sample of completed revised interview analysis tool

Interview Code: SA#5	
Aspect of research	Evidence from interview
Object	Health food, fresh food reaching the consumer within 24 hours of picking from the field
Tools (conceptual, physical and other people)	Learning from other farmers; Learning by mistake; Crop rotation, production throughout the year, irrigation in winter; Tractor, potato ridger
Rules (including policies, natural laws)	<ul style="list-style-type: none"> • Seasonal rainfall • Government agricultural policy • Government extension system • Agricultural pricing policy • Criminal and justice system
Community and power relations between them	Farmers, input suppliers, farm workers, organic produce consumers; organic produce retailers; trainers in organic farmers; other farmers; exporters of organic produce
Division of labour including position and relations	<ul style="list-style-type: none"> • Two-thirds of his farm workers are women because women tend to be more dominant in horticulture than men • He reckons that washing potatoes is not necessarily easier than digging. Men would not like to wash potatoes.
Subjects	Farmer
Contradictions and limitations	<ul style="list-style-type: none"> • Cannot sustain a western lifestyle which most farmers“ desire – Object, Level 1. • Organic farming at a small scale cannot generate income for meeting some of the basic family needs such as paying school fees – Object, Level 1. • Regular theft of cables on the farm, Community– Object, Level 2. • Frost, red ants, insects and cut worms and not enough tools to overcome them – Tools, Level 1. • Rising cost of farming not matched by rising prices of produce – Rules, Level 4 – Rule producing. • Smallholder farmer has limited access to exports – Rule producing, Level 4. • Some guys who get training in agriculture just to get a Diploma, a qualification – Community-Object, Level 2.
Relational agency	Learns with and from other farmers. This includes sharing knowledge about carrots growing and which varieties of carrots do well in the area.
Habitus, identity and tacit knowledge	<p>Learning by mistakes</p> <p><i>Interviewee: I am not sure he would say I taught him. He would probably say farming is in his veins. He is also patient about the soil. He has always had a piece of land. He has learnt a lot about organic growing. He always does it the right way using compost, staying away from scab. He grows potatoes.</i></p> <p><i>Interviewer: When you say it is in the veins what do you mean? Do you mean that some people are born farmers or are brought up in farming families or something else, what do you mean?</i></p> <p><i>Interviewee: Saying that people are born farmers is going into a different realm but everybody, when they are born, they have a calling. It is the only way I can describe it. It is a kind of a calling. Many commercial farmers now are doing it just purely for the money, it's like doctors are doing, practising medicine for the money. But some of us will do it no matter what</i></p>

	<p><i>happens.</i></p> <p>Men preferring to do the more physical work; women populating the horticulture sector better.</p>
Time-space considerations related to the practice / activity	<p>Vegetables do not do well in summer in the area. This means that other crops have to be grown then.</p> <p>Steep slopes are more difficult to manage because of the power needed to work them and also to protect the land from erosion.</p>
Motivation/Incentive	<p>Burning desire to farm organically</p> <p>Those who want to be successful in farming should have a bit of background in it. They should also be keen to do farming.</p>
Structure-Agency relations	
Innovations	<ul style="list-style-type: none"> • Dealing with cutworm by ploughing land and not planting it for about 6 weeks to ensure that there is no crop on which the cutworm can feed • Leaving weeds to grow as a cover crop and at the same time resting the land • Cutting out the middleman in marketing organic produce
Causal mechanisms Culture Power relations Environmental/ biophysical factors	<ul style="list-style-type: none"> • Large-scale commercial farmers have access to external markets which small-scale farmers do not have • The culture of theft undermines the development of agriculture – stealing cables and produce • Seasonality of crops • Hard and compact soils in his area require more work and thus the need for a tractor • Occurrence of frost
Scores of ecological, economic and social value (out of 10)	<p>Ecology = 10 Economy = 10 Social = 10</p>

Appendix 5: Four modes of inference in critical realism

2002. Danermark, B., Ekström, M., Jakobsen, L. & Karlsson, J.
 From: *Explaining Society. Critical Realism in the social sciences.* London. Routledge.

Table 1 Four modes of inference

	<i>Deduction</i>	<i>Induction*</i>	<i>Abduction</i>	<i>Retrodution</i>
Fundamental structure/thought operations	To derive logically valid conclusions from given premises. To derive knowledge of individual phenomena from universal laws.	From a number of observations to draw universally valid conclusions about a whole population. To see similarities in a number of observations and draw the conclusion that these similarities also apply to non-studied cases. From observed co-variants to draw conclusions about law-like relations.	To interpret and recontextualize individual phenomena within a conceptual framework or a set of ideas. To be able to understand something in a new way by observing and interpreting this something in a new conceptual framework.	From a description and analysis of concrete phenomena to reconstruct the basic conditions for these phenomena to be what they are. By way of thought operations and counterfactual thinking to argue towards transfactual conditions.
Formal logic	Yes	Yes	Yes and no	No
Strict logical inference	Yes	No	No	No
The central issue	What are the logical conclusions of the premises?	What is the element common for a number of observed entities and is it true also of a larger population?	What meaning is given to something interpreted within a particular conceptual framework?	What qualities must exist for something to be possible?
Strength	Provides rules and guidance for logical derivations and investigations of the logical validity in all argument.	Provides guidance in connection with empirical generalizations, and possibilities to calculate, in part, the precision of such generalizations.	Provides guidance for the interpretative processes by which we ascribe meaning to events in relation to a larger context.	Provides knowledge of transfactual conditions, structures and mechanisms that cannot be directly observed in the domain of the empirical. *

Table 1 Continued

Limitations	Deduction does not say anything new about reality beyond what is already in the premises. It is strictly analytical.	Inductive inference can never be either analytically or empirically certain = the internal limitations of induction. Induction is restricted to conclusions at the empirical level = the external limitations of induction.	There are no fixed criteria from which it is possible to assess in a definite way the validity of an abductive conclusion.	There are no fixed criteria from which it would be possible to assess in a definite way the validity of a retroductive conclusion.
Important quality on the part of the researcher	Logical reasoning ability	Ability to master statistical analysis	Creativity and imagination	Ability to abstract
Examples	If A then B A Thus: B	From an investigation of the attitude of a representative sample of Swedes, draw the conclusion that 30% of the Swedish population is in favour of the EU.	Karl Marx reinterpretation/redescription of the history of humankind from the historical materialist view.	For a ritual to be just a ritual there must exist, <i>inter alia</i> , emotionally loaded symbols and common notions of inviolable/sacred values.

Note

* The concept of induction has been used in partly different ways by different philosophers/theorists, and within different disciplines. Here we are talking about induction in the sense of inductive logic. In social science the concept of inductive is also used to describe a certain form of research procedure. We shall return to this research procedure in the next chapter. It is important not to confuse inductive logic with inductive research, since these concepts in part imply totally different things.

Appendix 6: Case Record (See CD-ROM)

**Appendix 6: Case Records on Exploring and Expanding
Learning Processes in Change Oriented
Sustainable Agriculture Workplace Contexts**

Prepared by Mutizwa Mukute

PhD Student Rhodes University

Prepared between May 2008 to December 2009

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SECTION 1: Introduction to case records

This section introduces case records and explains why I decided to keep them. It also explains how the case records are organised in this document.

During the course of my research journey, I decided to keep a record of the data that was being generated in each case study. I did this because I needed to obtain a clear and accurate picture of what was transpiring in each case study. I also wanted to be able to determine how experiences in one case study could benefit the next since I was dealing with multiple case studies. I further kept a case record in order for me to be able to communicate with participants in each case study separately based on what was most relevant to them. For example, I compiled reports for each case study and these were sent to research participants in the respective case study for their comment. My other reason for keeping a case record was that I was going to organise thesis chapters around themes, research questions and phases and not chronologically according to case study.

While I kept all the records for each case study such as interview transcripts, in this report, I extract samples from each case study in order to show how these were conducted. For example, I conducted ten interviews in Case Study 2 but I will show three in this document and these will illustrate conversations with farmers, trainers and a marketer. However, this document does contain the full reports that were compiled at the end of the first phase and those compiled following Change Laboratory Workshops because they illustrate a certain level of data analysis which was shared with research participants. They also show the reader how my depth of engagement with the research evolved over time.

The organisation of the report is determined by two main factors: the case number and the sequence in which data was generated in each case. The first part of the report deals with Case Record 1, the second with Case Record 2 and the third with Case Record 3. The data in each case record includes:

Phase 1: Letters of negotiating access; interview transcripts; thank you letters; a report; feedback on the report; document analysis and literature review.

Phase 2: Change Laboratory workshop transcripts; Change Laboratory workshop report; and feedback interviews/workshop report.

In order to make it easier to distinguish the three case studies, I have used different colours in the headings of each: green for Case Study 1; blue for Case Study 2; and red for Case Study 3.

I found case record keeping helpful in terms of providing depth of information necessary for the writing of the thesis and would recommend fellow scholars using multiple case studies to keep and use such records.

2. Case Record of Case Study 1

2.1 INTRODUCTION TO CASE STUDY 1

Case Study 1 is based on the Schools and Colleges Permaculture Programme (SCOPE) in Zimbabwe which facilitates the learning and practices of Permaculture (PC) in schools and colleges in Zimbabwe and has since become a regional programme based in Malawi. The case focuses on one of the primary schools that participate in SCOPE. The rural schools also work with farmers in the community to facilitate the learning and practice of Permaculture. Engagement with SCOPE this research commenced in May 2008 when I began negotiating access and ended in September 2009 when I 'left the field'. The next few sections show how data were generated and shared in the Case Study.

2.2 NEGOTIATING ACCESS

Below is an example of communication that shows how I negotiated access in the SCOPE case study. A similar letter was also used in the other two case studies.

REF: Request to partner with you and your partner farmers in exploring and extending the horizons of your current sustainable agricultural practice

I am an Environmental Education doctoral student at the Rhodes University who is interested in sustainable agriculture: how it is learnt and practised as well as how it can be expanded in the view of the environmental challenges such as climate change and economic challenges arising from surging fuel prices (in our growing carbon economies). As part of my studies, I am planning to carry out field work with development practitioners and farmers practising sustainable agriculture. My knowledge about your institution and its commendable work in agriculture convinces me that your case will offer good scope and depth. The research approach should enrich the learning and practising of sustainable that you, your organisation and communities you work with are already practising by generating insights and tools to further sustainability in your practices. The scope of sustainability covered ecological, social, economic and technological spheres of agriculture.

Given that a letter is not interactive and that there may be need for a face to face discussion if you have some interest in the study, I would be willing and able to visit you to engage in a conversation around the intended research work with you.

The objectives of the case study are to:

- 1. Establish how sustainable agriculture became a practice in your community or on your farm (history);*
- 2. Find out what motivated you to carry out sustainable agriculture;*
- 3. Explore how you learn sustainable agriculture;*
- 4. Observe and discuss how you practice sustainable agriculture;*
- 5. Collectively identify and analyse the current tensions and issues that you are facing in learning and practising sustainable agriculture (What is changing rapidly or unexpectedly and what are the new and emerging challenges for farmers and development practitioners?);*
- 6. Work with farmers, development practitioners in your community practising sustainable agriculture to develop tools that have potential to help improve the practice and learning of*

sustainable agriculture based on a shared understanding of the current tensions and issues; and

- 7. Find ways of embedding learning in the daily activities of agriculture in your workplace and in the farming communities with regards to sustainable agriculture.*

The research process will have the following components: literature review, in depth interviews, feedback workshops and developmental research workshops. I propose to carry out in depth interviews with two development practitioners who train/support farmers in sustainable agriculture. After that I would be keen to observe farmers and development practitioners at their workplaces so that I get insights on how they learn through work. After conducting the field work, I will prepare a report on my research findings that I will share with the research participants (development practitioners and farmers involved). The purpose of this would be to get feedback about the validity and authenticity of the findings and make the necessary adjustments accordingly.

The one-day feedback workshop will include a discussion on the issues and tensions that farmers and development practitioners are finding in practising and learning sustainable agriculture. We will use a tool called activity theory for carrying out the identification and analysis of the issues and contradictions. This workshop will probably take a day and about seven people would be expected to participate. At the end of the analysis, we will deliberate and reach a general consensus on the issues and contradictions that you want to address, which should have a practical relevance to the community in question.

The collective development of solutions by the farmers, development practitioner and me is based on the assumption that each one of us will bring complementary strengths and competencies because of our different histories and experiences. This research process will be spread over a number of days up to a maximum of 10 days. This will provide all of us with adequate time to reflect and finally contribute meaningful solutions for better learning and practice of sustainable agriculture.

After completing the above process together with me, you will be able to apply and evaluate the tools on your own and improve them as necessary based on feedback from practical implementation. In a sense, the research process aims to build on previous learning processes, and explore the dynamics of ongoing (expansive) learning process through practice and collective problem solving.

The wider interest of this research is to inform more agricultural education and extension methodologies and training programmes through a deeper understanding of workplace learning, as experienced by farmers and development practitioners who interact with them. The research is not extractive in nature but is designed to be participatory, collaborative and to contribute pro-actively to the learning and development path of your organizations and the farmers' work.

In a sense therefore, I would be interested in with you and a community of practising farmers around the question of building resilience and improved productivity to address food insecurity through new, expanded and more reflexive practices within the new climate of uncertainties.

I greatly look forward to your positive feedback and great working partnership in future.

Yours sincerely

Mutizwa Mukute

PhD Student (Rhodes Environmental Education and Sustainability Unit, Department of Education)

2.3 SAMPLES OF INTERVIEWS CONDUCTED

2.3.1 Sample interview with SCOPE facilitator

Interview with John Wilson (JW) on 27 August 2008 (with his comments received a week later)

MM: Hi John, and thanks for granting me this interview. Can you tell me about your history with Permaculture (PC)?

JW: I first learnt about PC through a distance library in Zimbabwe in the mid-80s. I read documents on PC that were written by Bill Mollison and I found the early books quite complex. It was difficult to read them but there was something interesting about PC. When I learnt that Bill Mollison was to come and hold a PC course in Botswana for Southern Africa, I decided to attend. We were 25 to 30 participants in the course. I found the course useful but the trainer's heavy Australian accent must have made it difficult for many participants to follow. During that time, Andrea Mercier was looking at how Fambidzanai could be used in relation to Education with Production. I recommended that we offer PC as the main theme at the Fambidzanai Training Centre. This was accepted. At the same time, I started practising PC at home and did a lot of reading on it. It seemed like common sense to me and I had no prejudice about how agriculture should be done since I had no background in it. I mean no background in the formal sense, i.e. university etc. but by 1987 when I attended the course I had a fair bit of experience in organic gardening and running a smallholding and so therefore I had a background in terms of practice, and also I had done a lot of reading.

MM: And how did your interest in sustainable agriculture in general begin? What motivated it?

JW: In the mid-70s I left the then Rhodesia because I did not want to serve in the army. I went to Europe and worked on farms. I liked gardening and at about 20, I had a fantastic garden. During then the organic movement was beginning to grow in Europe. I read a lot about it. At a young age, one has a lot of energy to read and it is easier to absorb new things. My first professional work which involved the promotion of PC started when I became the first coordinator in of Fambidzanai Training Centre, FTC in 88, after the study in 87. While there, I tried to link PC with other approaches. This desire led to meetings with other development organisations in east and southern Africa. From the meetings emerged a curriculum which resulted in the setting up of PELUM – a regional network of NGOs in east and southern Africa working in sustainable agriculture and natural resources management. We set up the organisation because we needed to keep linking beyond any one particular approach. Networking would support the curriculum, which became one of the strands of PELUM. In Zimbabwe another organisation was formed to promote Permaculture agriculture and it was to concentrate on outreach programmes. By then we had set up the Zimbabwe Institute of Permaculture, which had a coordinating function. NFN did outreach, while FPC did training at its centre. From the mid to late 90s when Levi was there FPC felt bereft by not being out there in the field. I was also involved in the development of the Schools and Colleges Permaculture Programme, which was initially housed in NFN. The programme developed as a result of one school called St Vincent being able to demonstrate that Permaculture can work at school. When Fay Chung, the then Minister of Education visited

the school, she was so impressed that she asked for a pilot programme to be implemented. That was 1992. The school had photographs that demonstrated the changes that had taken place at the school as a result of Permaculture. Another important school where the concept of PC was amply demonstrated is Nyahode Union Learning Centre, where through water harvesting using the football pitch and other structures, a recharged water table resulted in the perennial flow of the stream, with a number of small dams. The water was used to support the agricultural activities at the centre, as well as for drinking. [John designed the centre]. Although Fay Chung didn't visit NULC it also played a part as a pilot school. The pilot programme was evaluated and the results were impressive. There was agreement that the programme should be expanded and be linked to the Ministry of Education. The programme subsequently raised three-year funding from NORAD, which had provisions for hiring a full-time coordinator. We hired Walter Nyika in 1996. He came up with the term SCOPE. He was teaching 'A' level Geography then and attended a PELUM-run three-week Integrated Land Use Design workshop in Zambia. I remained on the SCOPE committee, linking them to potential funding partners. The expansion worked well in Zimbabwe and inspired Tudor Trust to support the scaling out of the SCOPE experience in Zimbabwe further afield. The regional SCOPE is now based in Malawi, headed by Walter. Its establishment took place after the necessary consultations had been made. You remember the meeting you attended in Zambia two years ago.

MM: That is quite a long and interesting history. Just a small question, are you suggesting that you are no longer capable of reading as much now as you used to be when you were younger?

JW: I think I have grown older and wiser but I cannot read and absorb as much as I used to.

MM: Could say how your experience in organic agriculture is linked to PC?

JW: PC is different from organic farming. It is the design part of farming. Other forms of agriculture can be 'hanged' onto it. It provides a kind of framework such as zones, sectors and guilds. It also provides a holistic way of looking at things. Organic farming and other practices such as Bio-intensive agriculture provide the techniques. PC can also be seen as farm planning. It is designing a piece of land to maximise relations between elements. Other kinds of sustainable agriculture emphasize linkages with the markets, others, the social side.

MM: How have you been promoting PC? What experience do you have as a promoter of PC?

JW: I promoted PC for a decade, largely using two-week training courses. People learnt by doing. They had to do lots of exercises in design during the course. They designed their homes also during the course, which made it immediately relevant to their real situations.

MM: How did you learn PC apart from attending the two-week course in Botswana?

JW: I did most of my learning by doing and it was more sustainable gardening. In addition, I did lots of reading on PC and other sustainable agriculture practices.

MM: What would you say is sustainable about PC?

JW: PC gives a framework to hang other aspects of sustainability and in fact goes beyond 'farming' to all land use - e.g. designing villages, homesteads etc. The principles can apply to any land use.

MM: What challenges have you encountered in facilitating the learning of PC?

JW: It is difficult to put PC into practice because it takes time for people get hold of it, to have the confidence to put it into practice. Confidence comes from doing things again and again. The danger is that you could fall in love with the theoretical concept, and not practice it. The theory is appealing. It's nice and neat. Besides, you can only have as much diversity as you have learnt to manage. It is a skill to manage diversity. Some people try to put in too much diversity too soon. It needs more training than two weeks.

MM: What worked well during training?

JW: It was when people designed their homes. One lady came to me during one of the courses and said to me she could not understand why she has not been harvesting water all along. She was looking at her home in a totally different way.

MM: Can we come back to challenges, what training materials did you use for training and how did your trainees find them?

JW: The materials we used for training was basically tailored for trainers not for farmers. This is a problem not only in sustainable agriculture. It is a general problem. In answer to your question a lot of the training materials we developed at Fambidzanai as handouts... There was quite a good collection.

MM: Other challenges?

JW: The challenge people face in practising PC in a farming situation is associated with Zimbabwe or other countries in Southern Africa having seasonal rainfall. It is more complex because it makes zoning difficult. The whole livestock thing is difficult. It is difficult to do whole land designs because in the dry season, animals roam freely and one cannot protect trees and other vegetation from being browsed or grazed. PC is weak on livestock management in such settings. This is where holistic management, especially the planned grazing management, comes in. So in such environments, people end up practising only certain aspects of PC. The schools are a good place to practise PC though because there is a lot of space, which is often protected and schools want to do something with their land as an example and for educational purposes and are not sure how to go about it and the Integrated Land Use Design – ILUD process gives them a way in which to do it in a participatory and integrated way.

MM: What contextual factors have enabled the learning and practising of Permaculture?

JW: The whole issue of sustainability, not destroying the land and a general growing awareness about soil erosion, environmental degradation. PC brought something that was not there, maximum beneficial connections - how to look at the land in a holistic way. Another helping factor has been the whole rise of nutrition-linked to HIV/AIDS. The pandemic is encouraging people to grow a diversity of foods and to use fewer chemicals for the production of healthy food for the sick.

MM: What constraints are being faced in promoting PC?

JW: One major constraint is the education system, especially the teaching of agriculture – because it comes from a different premise, which is high external input. It is a different

mindset, encouraging mono-cropping. It is like managing land as if it were a factory, not as a living thing.

MM: Would you say then that there are ambivalent messages being sent to farmers and trainers?

JW: Indeed.

MM: Any other point on constraints?

JW: PC is new and it takes time to develop skills to manage diversity. Two weeks is not enough. This is why we developed the idea of an apprenticeship programmes where people learnt and implemented PC for a period of two years. One of the challenges was that the training was not registered with the relevant ministry so people were not very keen to do the course and not get a recognised certificate in the end. Nevertheless, we trained a number of groups, three or four, each with about 6 trainees. This was another constraint, the cost. A trainer had to work with only six trainees at a time. Trainees were paid a minimum wage during the course. They learnt mostly through practicals, with an average of two afternoon per week spent on theory. You know some of our graduates John Nzira, Joe Matimba, Taero and Abigail. By the way, do you know that she passed away recently? She had an operation and did not wake up. Thinking about it more I really see this as a big issue - the need to develop longer term training and I think distance education is the way, combined with workshops now and again.

MM: Abigail? What a pity! She was so full of life ...

JW: Then we had a PELUM college, which also aimed at offering long-term training. Basically, we came to recognise that the two week courses are not enough to allow one to master the different concepts of PC or other sustainable agriculture practice.

MM: What happened to the apprenticeship programme?

JW: Reasons include not having a formal qualification. The other could have been limited funding.

MM: What limitations do you see in PC?

JW: It is difficult to sell it terms of production. It is difficult to measure benefits in terms of diversity. John Nzira and Bridget are working on something that will help people measure such benefits.

MM: What kind of tensions have you encountered in promoting PC?

JW: Something to do with combining the short term with the long term. You see, it can only make sense when it is part of a vision. The big picture is missing in the training among farmers, which makes it difficult for them to do those things that bring benefits in the long term. The big picture is missing because there is not general farmer education, looking at the big picture such as dangers of dependence so that farmers understand where they stand. To apply PC and other forms of sustainable agriculture you need motivation as a foundation. It is that level of awareness, which is helpful especially for implementing longer term things. It is about understanding the why. There other tension is around being too pure and not being pure enough. For example, in many agricultural environments of southern Africa the soil has

become so poor that it is difficult to grow much without fertilizer. So there may be need to use chemical fertilizers as people move towards sustainable agriculture. The organic purists would not be happy with such a process. Besides, some small-scale farmers just do not have the money to buy fertilizer. So many people have jumped on the band wagon. There is need to have broad values, and dialogue about the practices. There has to be debates. Then there is tension between the narrowness and breadth of sustainable agriculture... There is a bit of patronising that farmers need to know what to do, not why. Farmers may need to see cases studies so that they can make better decisions. This is part of the general education and awareness that I was talking about earlier. The issue though is how do you pay for that kind of education, awareness, which is where the sustainability lies?

MM: What can be done to improve learning of PC among farmers?

JW: One of the keys is to try and get farmer education happening among farmers on a continuous basis. Farmers need to have their own study groups. There is need to develop a culture of learning at farmer level. This is how farming improved in Europe in the late 1800s and early 1900s. The idea of folk schools in Denmark is a case in point. It supports ongoing learning among small-scale farmers. Learning is a long process.

MM: Against a scale of 1-10, please rate the sustainability levels of Permaculture in the communities you have worked with. We can use three kinds of sustainability against which to measure PC: ecological, economic and social. What would you say?

JW: I would score ecological sustainability very high, especially when we are looking at the long term. I would score 9 or 10. Economic sustainability is also high though not immediate. It is generally lower in the short-term. Social sustainability would score very low. This is how in integrated land use design courses, we ended up including holistic goal formation, which comes from holistic management. I would score 4 out of 10. This is actually a tough question because in fact Permaculture would also score high in the longer term as far as social sustainability goes because of its emphasis on localisation. It's just that it doesn't really have the 'group approaches' to engender the strong social bonds such as visioning and so on. So it's not so much that I would score it low but rather not score it at all - this is not its area of focus and hence the need to link with other approaches.

MM: Would you mind giving a score for economic sustainability. You said it was high but did not give the figure?

JW: 7 or 8 I would say.

MM: What do you see as the weak links in Permaculture learning and practice?

JW: Learning to manage diversity more. Sometimes the concepts are quite nice. The other thing is the water. Whereas in areas where water is not an issue, you can grow a lot of plants at the same time, when water is little biodiversity is compromised because you must remove some plants which can survive on the little available water. This is especially the case in a dry rainy season. Management is much more complex. A lot of traditional farming practices are diverse as well. The big issue is about applying PC when you have a lot of free-range livestock around. It can be so destructive and yet provide useful inputs such as manure.

MM: What policies have a bearing on the promotion and practice of PC?

JW: The dominant policy is still pushing for high input agriculture. It seems in the education the policy of education with production and linking the schools grounds to the curriculum was encouraging while that of promoting neat schools worked against PC. There are ambivalent messages from government on this. You would expect that with so many challenges facing the country, people would promote and practice sustainable agriculture more effectively in the same manner that Cuba moved into sustainable agriculture when its oil supplies were cut off. Having said that I must say that, I am encouraged that even the private sector, ZIMPLAT – the platinum company, is encouraging surrounding communities in Ngezi and Mhondoro to practice zero tillage. They hired a former seed company employee, who has been promoting high input agriculture – from PANNAR, to work with farmers on conservation farming.

MM: What reservations do you have about PC?

JW: None really. Not as long as people are not dogmatic about it. If they can remain open to debate. I worry about the tough environment, the seasonal rainfall and in most rural and communal areas; there is the challenge of managing livestock.

MM: What else would you like to say about PC in relation with how it is learnt?

JW: With PC, I have been trying to point out the need for comprehensive training. The world is ripe for it. PC needs to respond with a variety of educational courses. I fear though that it is trying to do too much by becoming a movement when it should be focusing on being an educational tool. Sustainability living should be the ‘movement’. Farmer research should be encouraged. Farmers try and test and make their own decisions. Schools are the best entry point for Permaculture because there is land, erosion, bare soil. PC is immediately applicable since it links nicely with different subjects in the school. The school can then become the learning point, the seeding point for the surrounding community, allowing for the local spreading of the practice.

MM: Could you say something about global developments and PC, or make any other comment on the PC and how it is learnt?

JW: The sustainable development discourse has created a huge potential for sustainable agriculture. There is a will which there never was 20 years ago. There is no need to mainstream because the realities are forcing smallholder farmers to try sustainable agriculture practices. For example, fertilizer in Kenya went up three times within a year. The other push factors are climate change and increasing oil prices. It is the oil prices that push up fertilizer prices because it is made from natural gas and the price of natural gas is linked to oil price. It is a whole different world now. People used to do their little things in little corners. Need to come up with big ambitious strategies, bigger thinking across the world. Donors are also re-thinking their policies in relation to sustainable development. Then food prices have been going up significantly, compelling people to grow food for themselves, achieve a certain degree of self-sufficiency. Sustainable development is the main topic in the world. The challenge is that there are a lot of novices promoting sustainable agriculture, who must get their act together to offer more comprehensive education and training. Meanwhile, Africa cannot afford to follow the Western path of consumption patterns and levels. The economies of the West grew on oil. Part of the response lies in the localisation of production of goods and services. Certainly there is need to be incredibly creative.

MM: If you have no further comments to make I would like to thank you very much for affording me the opportunity to hold this conversation with you and for sharing your thoughts and insights on PC with me. I will produce a script on the conversation and send it to you by e-mail. I would be grateful if you could go through it and check on whether I got the facts right. And if you have further thoughts on the subject, you are most welcome to send them together with your feedback on the script. It was great talking with you.

JW: It was my pleasure. All the best with your research. I will be quite happy to read the script and to comment on it. You can have some of these fruits from the garden. I have got two guys working in there. They work very hard but they have not mastered the basic concepts of sustainable agriculture. I am planning to send them on a course in PC.

And then we had the fruit and took a walk in the garden, which is designed using Permaculture principles. This is a garden in Borrowdale, one of the most posh areas in Harare, where landlords/ladies tend to grow flowers and lawn. JW's family grow a lot of food in the acre or so garden. He showed me his water harvesting designs, where he catches water from the roof of his house and channels it into a pool in the garden. He plans to harvest more water from the roof in future and use it for gardening in the dry season. He also showed me his borehole in the garden and a tank into which water is pumped and stored for domestic and agriculture use. Water supply in the city has become unreliable over the last few years. And so is power. He is planning to „gosolar“. This way, he can achieve a certain degree of self-sufficiency in his home.

2.3.2 Interview with St Margaret teachers to promote Permaculture

Visit to St Margaret Primary School which practises and promotes PC 2 September, 2008

I had a letter from the SCOPE Coordinator, asking the school to cooperate with me and to provide two facilitators and two community members involved in PC. The head was welcoming. We later discovered that he went to school with my father and that seemed to encourage him more to assist. He then invited the appropriate teachers, two of them, plus the Deputy Head to assist. He left us in his office for our discussions and invited me to see him if there was need to do so. After finishing the interview, I went to bid him farewell and to let him know that I needed to come back the following day. He had a plateful of bananas from his homestead at the school to give me.

When we started the conversation, I was not prepared for a group interview but that is what the teachers wanted. I make a quick decision to work with that. And so we began:

Maurice Yahaya (MY), Deputy Headmaster

Lovemore Manyati (LM), School teacher and SCOPE facilitator in PC

Claudius Mugauri (CM), School teacher and SCOPE facilitator in PC

MM: Could you tell the history of St Margaret and its practising and promotion of PC?

LM: St Margaret was one of the first two schools to be selected to participate in the SCOPE programme in Mashonaland East Province, the other one being St Vincent. It was to be a pilot case and that was in 1994/5. The second phase of SCOPE began in about 1996 when it selected two schools per district to work with. These were schools that would also learn from us. The third phase started recently in 2005 when the cluster approach was used per district.

There are six primary schools and two secondary schools in that cluster in Hwedza district. St Margaret provides a working example of PC and also provides the facilitators that teach PC in the other schools. In this school, PC has a structure and I am the Chief Executive who oversees the promotion and practising of PC.

MM: What does PC involve?

LM: Taking care of the land, intercropping, growing vegetables and crops as well as herbs for medicinal values. Herbs are also used as pesticides in place of chemical pesticides that tend to harm the environment.

CM: If I can add a bit on the history. One of the reasons why St Margaret was picked was the environment – the erosion that was at the school and a lot of bare ground. It was desert-like. You should see the pictures. The PC project wanted to eradicate land degradation in the school. It has made a lot of achievements and has given the school a new face. The grounds are zoned, the school has shade, and the erosion is gone. The transformation took place within 3-4 years. This is what we are spreading in the cluster. Since 1995, the school has had a lot of visitors attracted by PC. Recently, that is in 2005, the Provincial Education Director was at the school to launch the cluster system in the district. As PC facilitators, we have been to a number of schools in the cluster holding workshops. Apart from sharing our knowledge, we share planting materials with the other schools. One of the problems that we are facing now is the erratic power supply, which means that we cannot water the garden as regularly as we would like.

MY: In 1996 we received a donation from the former Minister of Agriculture's wife (Dennis Norman) in the form of a tank, which we use for storing water. It is essential for those zones needing regular supply of water. In 2002, we received an engine that pumps water and is driven by electricity. More recently, and in response to the HIV and AIDS pandemic, we introduced a nutrition garden for orphans. From it, we sell vegetables and the money is used for paying the orphans' school fees. SCOPE also bought two goats towards the orphans' project. Each child has a chance to get a goat, which they can use to build small livestock in the family as serves as a potential source of income in future. We have also received some planting material from SCOPE.

MM: What motivated you to adopt and promote PC?

CM: The local environment in the school made it imperative for one to practise PC. The school has a policy that obliges all teachers to take part in PC. The Ministry of Education supports this too. At an individual level, I saw the potential to benefit from new knowledge and when I started learning about it, I realised that there was so much to benefit. The motivation became intrinsic. I now know about herbs for healing and pest control, which saves money. I use the knowledge beyond school hours in my home as well. Some of us who got exposed to the training ended up being employed elsewhere. Two former teachers found good and well-paying jobs, one with MAYO and the other with Environment Africa. The benefits of PC are clear and evident as you can see from the school.

MM: What is your understanding of PC?

LM: It is permanent agriculture. It builds on how our ancestors used to do farming, intercropping.

CM: It is interested in the continuous increase of the productive capacity of the land ... soil maintenance, eradicate soil erosion. We design beds in the garden to manage water movement and prevent soil erosion. We avoid use of chemical fertilizers because they can harm the ecosystem. PC promotes the idea of living in harmony with nature and tries to copy from natural ecosystems.

MM: How did you learn PC?

LM: We went to Fambidzanai Permaculture Centre and got training for two weeks. When we got back to the school, we ran short courses for staff. It is a requirement. During the training at FPC, we do both theory and practice.

CM: There is a lot of practising during the two-week course, designing.

MM: What learning or teaching methods are employed?

LM: Handouts, TV, films, PowerPoint projector, charts and diagrams, lectures and group discussions. We also do a lot of group activities, which include land use designs, dart throwing and biological assessments and transect walks.

MM: Which methods have you found most effect for your own learning?

CM: It depends on the topic. Group assignments can be useful when one wants to get a collective picture or position on something. For example, the state of soil erosion at different schools and how that can be tackled. Sometimes it is essential to do research, go out and look for information.

MY: Group work is effective because it brings together the thoughts of different participants.

LM: What we find most useful is the infusion of different learning. Sometimes a demonstration is effective, sometimes it is learning by discovery. What I liked at FPC is that it has a good learning environment: the garden, the nursery, the broader environment.

CM: We use local workshops to pass on new knowledge. We also make time to pass new knowledge to teachers who join the school. The school has provision for staff development, which takes place on Wednesdays between two and three in the afternoon.

LM: After the training, we always give the headmaster feedback. We then develop a programme outlining how the new learning can be shared with other stakeholders of the school, which usually include the councillors, headman or his representative, prominent farmers, influential members of the Church, and Home Based Care givers, their representatives, clinic staff representatives and the business community. We must always let them know whether the workshop will provide food.

MM: How often have you gone for refresher courses?

LM: About three times.

MM: And how often have you trained other people, held workshops to facilitate learning in the community?

LM: I have conducted several training workshops. The highest number was in 2005 and 2006 soon after the cluster system was launched. We ran workshops for each school, seven of them. At each school we spent about a week. Those who attended were teachers and parents.

MM: What was the content of the training and how does it differ from the training you get as facilitators?

LM: The one-week workshop focuses on the design principles of PC. We introduce the subject and explain the key concepts. After introducing the theory, we do a lot of practicals which include designing gardens, water harvesting, designing beds, and erosion control. An important part of the practical side is to ask people to develop a vision, a goal of how they would like their school to look in the next few years, so that their work is directed towards that goal.

MY: We also cover know your elements and plant companions.

LM: Towards the end of the one-week workshop, teachers at the school are asked to develop an action plan of how they will implement PC concepts.

MM: What training or facilitation methods do you use?

CM: We use several methods, some of which are discussions, lectures, visuals such as charts, demonstrations and practical work. The difference between our two week facilitator course and the one week workshop for schools and communities which we run lies in the detail.

MM: What challenges or constraints do you encounter in running the course within one week?

CM: Firstly, we can only run short courses because PC training is not our core business as teachers. When we are not teaching our classes, someone else is asked to do that on our behalf. Parents and sometimes the pupils themselves do not like this. And we cannot be away from the class often, for too long. Time limitations mean that we cannot cover some topics adequately. The topic that suffers most is often know your elements. There is so much that has to be shared on this topic. For example, if one looks at the school building or house as an element, one sees many functions which cannot be covered during the course because other elements must be discussed. The roof is good for water harvesting; the walls reflect sunlight, which is important for plant growth. The later concept takes time to drive home to the participants. Then when it comes to herbs, there are so many of them, with some many functions. We can only cover so many during the week. And people tend to be more interested in these kinds of things, especially these days. Apart from understanding each specific element and its functions, we must also share how the elements relate to each other. There is not enough time to cover this. The other constraints are motivational. The incentives are either low or absent. Sometimes, in this economic environment, we are unable to raise the transport money to get to the places where we should run workshops.

LM: The other challenge we face is that of breaking the content to suit the participants. This challenge is further compounded by the fact that we often have a mix of participants, pupils from Grades 4 to 6; parents and teachers.

MM: How do you address the challenges, or resolve the tensions?

LM: We use the local language.

MM: Do you have learning materials in the local language as well?

LM: No, we do not. We have been planning to do so. In fact, we were invited to develop some materials in the vernacular by SCOPE but we have not yet come to doing that. We are interested.

MM: How much text is there in the handouts in relation to visuals?

CM: There are not many illustrations but we do a lot of practicals, which helps a lot. The other challenge is that the language in the handouts is too advanced for the readers. It may also need simplifying in English. The language is for intellectuals. Participants have to rely more on listening to the facilitator.

MM: How do you monitor the quality of learning of PC?

LM: We conduct an evaluation at the end of the course and participants fill in forms.

MM: In what language is the evaluation form?

LM: In English. We read out and explain each point as they fill in the forms.

MM: What qualitative changes have you noticed in your facilitation of PC learning?

LM: The changes have not been consistent. We have moved back and forth. For example, the food quality and quantity has become poor.

MY: The number of handouts per course is falling.

CM: During delivery of course, I have learnt new things, which I have found useful in subsequent workshops. I have grown in confidence over the years from teaching the same things again and again. I have taught primary school children, parents and university students. When I teach university students, I feel that I should be more prepared and this forces me to master things better.

LM: My language has improved because I have had to run course for adults in English. In my day to day work, because I teach low grades, I speak in the local language most of the time.

CM: I have also learnt about the kind of humour that works with adults. It is quite different from that which pupils prefer in class. I have also learnt that adults are motivated differently from children. The supervision of adults and that of children is completely different. An adults can tell you 'pfutseki' and leave the workshop. My tact in working with adults has improved over the years as a result of promoting PC in schools and communities.

MM: How would you score the ecological, economic and social value of PC out of 10 and for what reasons?

	Ecological	Economic	Social
LM	10	5 (transportation of surplus fruits is problematic)	6 (pupils who till gardens often can't buy the produce because they do not have money. Teachers buy though at higher prices; some people are not happy with the selling prices)
CM	10	5 (low productivity, low turnover, produce in small quantities)	9 (good distribution of PC surplus in community; good sharing of planting material with the community and with surrounding schools)
MY	10	4 (it does not compare as much with conventional farming where crops can grow rapidly and generate income)	8 (community resources are not eroded away)

MM: What other comments do you have on the learning, promotion and practising of PC?

LM: Our school is zoned into 7 areas, with zones 0 to 6. The 0 zone is the headmaster's office, followed by the assembly which is in front of his office and the back of his office. Zone 2 is where we have our nursery and herbs, while in zone 3 we grow vegetables and fruits. In zone 4 we grow maize during the wet season; while in zone 5 we grow vegetables and fruit trees. Zone 6 is further away from the centre of the school and is outside the school fence. There we often face problems of livestock. All the pathways in the school as you may have noticed are covered with grass. This is deliberate because it prevents splash erosion. At the same time, the trampling done of the grass kills eggs of pests before the grass is used for making compost for the school. In PC, we discourage bare ground because it often results in soil erosion.

CM: The school has an independent structure for PC. The PC has a Chief Executive Officer under whom there is an Operations manager and an Administration manager. Under the Operations manager there researchers and zone leaders, while under the Administration manager there is a finance officer and a marketing officer.

MM: This is a lot of work and a great history. I wish you all the best and will certainly be coming back again to discuss further some of the things you are doing, especially in relation to farmer learning processes. I would be very pleased to have a guided tour of your garden and later, to know of which farmers you think I should visit for purposes of this study.

LM: We are very pleased to have you here and would also be keen to know what comes out of your research...

2.3.3 Interview with farmers

Group interview with farmers in Chigondo, Hwedza district 3 September, 2008

Farmers met are Admire Bake; Munyaradzi Mupfupi; Florence Chokotoza and Ratidzo Munyadzi. These are two couples of farmers who practice PC principles in that garden, which is found on a wetland. The wetland has clay soils which crack during the dry season. In the wet season the land is waterlogged and difficult to work. Munyaradzi and Admire are

brothers and share the same parents even though they have different surnames. The garden, which the farm belonged to their late father and when he was allocated it, the headman did not consider it to be a valuable piece of land.

The interaction with these two families of farmers started with a tour of the five-acre garden in which they grow perennials and annuals, fruits and vegetables, cereals and pulses. The crops that were in the garden during the visit were: onions; leafy vegetables of different kinds; cabbage; carrots; tomatoes; bananas; wheat; coco yam; maize; moringa; sweet potatoes; beans; peas; sugar cane; oranges; lemons; and nartjies. There were several ponds and one water pump powered by petrol. There were a number of water pipes and a drum which was placed at one of the points, and into which water would be poured. It would then flow by gravity to the required sites, cutting labours needs to carry water cans for long distances. The farmers had a nursery for fruit trees, most of which were budded or grafted. These included citrus; moringa; mango; grape; and granadilla.

We held the interview seated under a tree. Part of it was held while the farmers had their meal, together with the two facilitators who had accompanied me.

MM: What motivated you to go into farming?

AB: I was born to a farmer. I grew up farming. I tried other jobs but found that they were not good for me so I returned to farming. I have been farming since the 1980s.

Mu: I have never known any other kind of work in all my life. I went straight into farming soon after completing my O Levels. I used to visit my uncle who was an employee somewhere and I did not like the way he was treated by the employer and his children. Not much respect for him.

MM: And you madams, what motivated you?

FC: I found my husband farming and just joined him.

RM: Same applies. I found the going tough in the beginning but I am used to it now.

MM: How did you learn?

AB: When we were made to do agriculture, we did not enjoy it. Our parents grew sugar cane and rice mainly. We used draught power for ploughing the land, which is difficult to till. We used buckets for watering. However, we have since introduced pipes to cut drudgery. That was in 1994. In 1993 we bought a cart which has been useful for ferrying produce from the garden and for bringing manure from the kraals. So to answer your question, we learnt from our parents. We also learn from fellow farmers. An important learning place is the market, where we sell our produce. This could be at the provincial town in Marondera or in the capital city Harare. When I admire the produce from another farmer, I approach him and ask a few questions. This is how I learnt about things from other farmers.

Mu: I learn from doing. I have also learnt from and through NGOs and AREX. I am motivated by the desire to do better. We also learn from each other here on the farm, as well as from other farmers in the area.

FC: We learn from our husbands.

MM: And how do you as husbands teach your wives and possibly, your children (There were some in the garden)?

Mu: We do work together so they learn from doing and seeing how we do it.

AB: Sometimes when we are away, we assign duties to our spouses and children and they do work on their own. We always try to motivate the children by bringing them something from the markets, and tell them that it has come from the garden produce.

Mu: Our children learn by watching, copying and comparing. We serve as role models. Sometimes they listen to our conversations and learn from them. They also ask to be given specific duties to carry out, especially over the weekends. We like to catch them young because it is difficult to teach an old dog, new tricks or to train an old horse. We also correct them when they have done something wrong.

MM: When did you start practising PC and why?

Mu: We practise sustainable agriculture. In the past we were made to believe that crops cannot grow properly if you do not apply chemical fertilizers. PC taught us that it is possible and desirable to use organic fertilizer, which also improves the soil. You see that our soils are very heavy, they are clay. With some organic manure, we improve it. Organic fertilizer is made from locally available resources. You see the banana leaves you are sitting on: in the past we used to leave it to rot, which was good for some plant and animal life but we did not use it enough for production. Now we produce more manure because we take it to the kraal and we have increased the volume of manure about fourfold as a result. This has increased production and productivity in the garden. PC also taught us about soil and water conservation not only in the garden but beyond, in the broader environment. We also learnt and applied intensive intercropping from PC. Apart from skills, we also got new seed varieties, including herbs.

MM: I noticed that you do vegetable seed production in the garden. Did you learn this from PC as well?

AB: No, we learnt this from our parents. However, we learnt about budding and grafting in PC, which is an important part of seedling production. Personally I attended a one-week PC course and learnt about maintaining soil fertility; the primacy of soil in production. I also learnt about cropping patterns and the seasonality of certain things. I learnt about companion planting too, the plants that grow together well and those that do not. In fact, some of the things that were taught I already knew about but it was good to have someone confirming that they made sense, that they were right. You see, it is like in the past there were *n'angas* assisting people who had problems, nowadays we have *mapositori*. If you remain as the only *n'anga*, you can feel so isolated that you begin to lose confidence in what you are doing. PC managed to bring us together and to value something more consciously, together. PC also armed me with some facts which I could use to argue why I was doing production the way I was. For example, the value of taste in our produce, the connection between a healthy plant and ability to fight diseases – then there is the fact of organically produced food being healthy because it does not have chemicals. In a sense, PC popularised sustainable agriculture.

Mu: We now grow new crops such as moringa and wheat.

FC: We also grow peas and tomatoes.

RM: Coco yam and sweet potatoes.

MM: Apart from learning from each other as farmers and from extension workers, do you learn on your own? Have you felt that you have discovered something new, no matter how small?

AB: I do trials and monitor all the time. When productivity declines, I look for reasons. Could it have been the spacing, the timing, the variety or inadequate manure? This makes me change and improve next time. Now I know which varieties of tomatoes tend to perform well in the garden.

MM: How often does this kind of learning happen?

AB: It is seasonal, mostly. But I also monitor the vigour of the plant as it grows. For example, you saw the maize crop intercropped with tomatoes, it is doing very well and I believe that it is the amount of water that it has received, which is more compared to the maize crop in other pieces of land in the garden.

MM: Which crops are most viable?

Mu: Tell us ladies. You know better.

FC: Tomatoes are the best income earner, followed by green maize.

RM: And then vegetables.

MM: And which ones are the least viable?

FC: Coco yams.

Mu: And this is partly because we plant a small portion of the land with that crop.

AB: And wheat is another low income generator. This is because one needs huge pieces of land in order to produce enough to eat and have surplus to sell. As it is, if I were to plant tomatoes, where there is wheat, I would get four to five times the income.

MM: Have you done any experimentation?

Mu: We planted bananas as a way of protecting the river bank, when in fact the government regulations were that we should not plant anything within a certain distance from the river bank. In 1992, the Natural Resources Board officers fined us for breaking the law. However, in 2004, the same authority awarded us a national prize for effective conservation practices for looking after the same river bank using the same methods for which it had fined us. This was under the National Zimplow Competition. You saw that piece of land where there are citrus fruits. In the past we used to set it aside for green maize only. We decided to get more from it by planting fruit trees as well. And this is paying off. We see it as a form of agro-forestry [Did not see any nitrogen fixing plants though]. We learnt that clay soil performs better when we add organic matter through experimentation. We have also learnt that the garden offers far more production during the dry season than the wet. We have learnt to build business using local resources, gradually transforming the scope and scale of what we offered to the market. We also create income generating opportunities for locals whose labour we sometimes hire.

MM: How would you score the economic, environment and social value of PC? Say out of 10?

AB: I would give 100 % on the environment, 85 % on the economic and 95 % of the social.

Mu: I would also give similar scores if not the same.

MM: Could you explain your scores, especially the high score on the economic.

Mu: You see, there is very little one must spend in order to produce. Besides, with intercropping, you can produce a lot of crops at the same time, each with a different value. The other thing that we do here is to make sure that there is something growing in each part of the garden during most time of the year. You see that the tomato crop has been harvested. We have plans for these beds. What makes this kind of agriculture sustainable is that you produce one crop after another, continuously.

AB: The social is high because you do not talk about survival of the fittest. Everyone, even the poor people can practise PC or sustainable agriculture. Most of the resources are locally available. For manure you can go and collect humus from the mountains. I know of some families whose lives were transformed by zero tillage. They used to wait until late in the season to plant because they did not have draught power, and those who have plough their lands first. So through zero tillage, they could plant at the beginning of the season. More people can benefit.

MM: What other comments do you have on PC and its practice?

AB: For anyone to succeed, they must have a goal in life. In history we learn that there were peasant farmers and commercial farmers. The peasant farmers produced for subsistence. What we want here is to produce first for food security and then for the market. We treat farming as an industry, a business. In this sense, we see ourselves as commercial farmers. After the goal, one must have ‘landmarks’ that show what one wants to achieve each season. You must have an idea of what you want to get from planting beans, for example. Records are useful to keep for reminding the memory. We also help the memory by naming livestock after the source of income which was used to purchase them. So we can call a cow Beans. It is also important to move from smaller items such as slippers to bigger ones such as properties.

Mu: We should always invest to move forward. There is one kind of investment which is very important but which people tend to undervalue. This is investment in relationships and socialising. It is from these relationships that we learn to move forward. You come here. I establish a relationship with you. I learn from you and you learn from me. Sometimes we must spend money in order to learn, spending it to travel and meet such people. I like sustainable agriculture or PC because they build our self-reliance. We can sustain ourselves. We have learnt to diversify crops and you know what has happened, where we used to grow maize from grain only, we now grow wheat as well. And this year it means wheat is covering the gap left by poor harvest of maize.

AB: I find that knowledge is power. But what is even more important is that one needs to link different types of knowledge in order to create the spark. It is like connecting the positive and the negative to start an engine. We had some knowledge about farming. We attended workshops and learnt some things which we then combined with our own.

MM: What examples do you have of such connections?

Mu: We used to throw away banana leaves in the garden but now we use them for making compost which is applied in the garden. We add it in the cattle kraals, where it forms part of manure. The quantity of manure has increased more than fivefold. We also make money throughout the year now. We plan our production to allow this to happen. At least once every three days, we must handle some cash. More recently we have moved into beekeeping and we produce candles which last three times longer than those bought from the shops.

MM: If there are no other comments for now, I would like to thank you very much for your time and for the experiences and insights that you have shared with me. I promise to come back again and discuss further with you about how you are learning PC.

2.4 SAMPLE ANALYSIS OF INTERVIEWS

Processing the interview with JW

Mediating artefacts: Long distance library; school, centre and home grounds; funds and other resources; Institutions; experience in agriculture; reading books and other publications; attending PC courses; participation in pelum curriculum design; designing and facilitating PC/ILUD courses; practising PC; demonstrating PC; mobilising donor support, evaluations

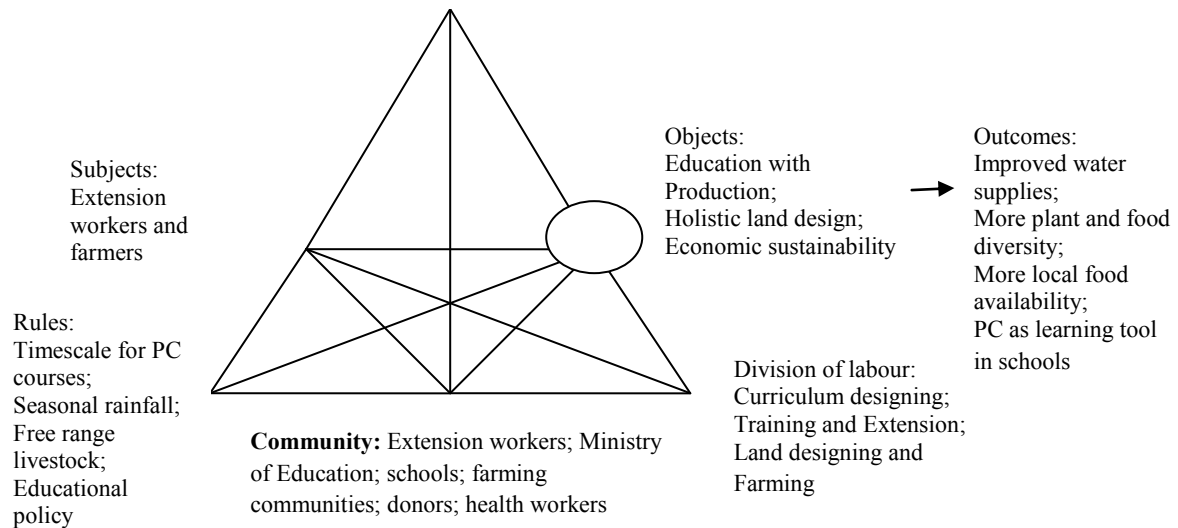


Figure 1: Activity system constructed from an interview with JW

Tensions identified in interview with JW

Description of tension or limitation	Location of element in the activity system
JW: I read documents on PC that were written by Bill Mollison and I found the early books quite complex	Level 1, Tools
JW: I found the course useful but the trainer's heavy Australian accent must have made it difficult for many participants to follow.	Level 1, Tools
JW: Besides, you can only have as much diversity as you have learnt to	Level 2, Between tools

manage...Some people try to put in too much diversity too soon.	and the object
JW: The materials we used for training were basically tailored for trainers not for farmers. This is a problem not only in sustainable agriculture. It is a general problem.	Level 1, Tools
JW: The challenge people face in practising PC in a farming situation is associated with Zimbabwe or other countries in Southern Africa having seasonal rainfall.	Level 1, Rules
JW: The whole livestock thing is difficult. It is difficult to do whole land designs because in the dry season, animals roam freely and one cannot protect trees and other vegetation from being browsed.	Level 1, Rules
JW: One major constraint is the education system, especially the teaching of agriculture – because it comes from a different premise, which is high external input.	Level 1, Rules or Level 4, interferences from a rule-producing activity
JW: PC is new and it takes time to develop skills to manage diversity. Two weeks is not enough.	Level 1, Rules
JW: One of the challenges was that the training was not registered with the relevant ministry so people were not very keen to do the course and not get a recognised certificate in the end.	Level 1, Object (Outcome)
JW: Nevertheless, we trained a number of groups, three or four, each with about six trainees. This was another constraint, the cost. A trainer had to work with only six trainees at a time.	Level 1, Tools
JW: Something to do with combining the short term with the long term. You see, it can only make sense when it is part of a vision. The big picture is missing in the training among farmers, which makes it difficult for them to do those things that bring benefits in the long term.	Level 1, Object
JW: To apply PC and other forms of sustainable agriculture you need motivation as a foundation. It is that level of awareness, which is helpful especially for implementing longer term things. It is about understanding the why	Level 2, Tools-Object relationship
JW: There other tension is around being too pure and not being pure enough. For example, in many agricultural environments of southern Africa the soil has become so poor that it is difficult to grow much without fertilizer. So there may be need to use chemical fertilizers as people move towards sustainable agriculture	Level 1, Subjects
JW: Then there is tension between the narrowness and breadth of sustainable agriculture	Level 1, Object
JW: The issue though is how do you pay for that kind of education, awareness, which is where the sustainability lies?	Level 2, Rules and Object relationship or Tools and Object relationship
JW: Social sustainability would score very low... I would score 4 out of 10. This is actually a tough question because in fact Permaculture would also	Level 1, Object

score high in the longer term as far as social sustainability goes because of its emphasis on localisation. It's just that it doesn't really have the 'group approaches' to engender the strong social bonds such as visioning. So it's not so much that I would score it low but rather not score it at all.	
JW: ... [W]hen water is little biodiversity is compromised because you must remove some plants which can survive on the little available water. This is especially the case in a dry rainy season.	Level 1, Tool or Level 4 Tool-producing activity
JW: The dominant policy is still pushing for high input agriculture. It seems in the education the policy of education with production and linking the schools grounds to the curriculum was encouraging while that of promoting neat schools worked against PC. There are ambivalent messages from government on this.	Level 1, Rules
JW: The other push factors are climate change and increasing oil prices. It is the oil prices that push up fertilizer prices because it is made from natural gas and the price of natural gas is linked to oil price.	Level 4, Rule producing activity
JW: Donors are also re-thinking their policies in relation to sustainable development.	Level 4, Tool producing or rule producing activity

What can be done to improve learning?

- Appropriate resource materials
- Having case studies
- Farmers trying out, experimenting
- Provision for continuous learning
- Combination of workshops and field work over long periods

2.5 REPORT ON EXPLORING FARMER LEARNING IN CASE STUDY 1

1. INTRODUCTION

Sustainable agriculture is one of the major responses to risks posed by the excessive utilisation of natural resources for industry and human population growth. It is located within the broader framework of sustainable development: *“a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development, and the institutional change are all in harmony and enhance both current and future potential to meet human needs and aspirations,”* (World Commission on Environment and Development, 1987, p. 46). In pursuit of sustainable development, the 2002 World Summit on Sustainable Development endorsed Agenda 21 and further recommended a United Nations Decade of Education for Sustainable Development (UNDESD) to integrate values, principles and practices of sustainable development into all aspects of education and learning towards environmental integrity, economic viability and a socially just society for present and future generations (UNESCO, 2005). One of its four objectives, which is of interest to this study, is the use of education for sustainable development towards the achievement of UN Millennium Development Goals (MDGs). This study seeks to address two MDGs: MDG 1, which is concerned with reducing hunger and poverty and MDG 7, which seeks to ensure environmental sustainability in the context of poverty, risk and

vulnerability (Lotz-Sisitka et al., 2006), which makes sustainable agriculture an important part of the solution. Pretty (1999, p. 11) explains sustainable agriculture as farming that makes best use of nature's goods and services whilst not damaging the environment. It does this by integrating natural processes such as nutrient cycling, nitrogen fixation, soil regeneration and natural enemies of pests, into food production processes. It also minimizes the use of non-renewable inputs and chemicals that damage the environment or harm the health of farmers and consumers (Pretty, 1999). Sustainable agriculture taps into the knowledge and skills of farmers, thus improving their self-reliance and capacities.

UNEP (2006) noted that sustainable agriculture is informed by **collective learning and adaptive management** practices that handle **complexity and uncertainty**. Collective learning for sustainability and adaptive management are closely associated with the concept of **expansive learning**, which uses contradictions, joint analysis and joint modelling of solutions; and their considered application as a central part of dealing with new and emerging problems. This study aimed to explore how farmers are learning and practising a form of sustainable agricultural practice called Permaculture to address the following questions:

- a. Why are farmers incorporating sustainability in their workplaces (fields and gardens)?
- b. How do farmers learn about sustainable agriculture in their workplaces?
- c. What are the main features of the SCOPE activity system?
- d. What are the current limitations and contradictions of sustainable agriculture learning processes and practices among farmers?

The study treated the farmer's workplace as including their gardens and fields (and those of others), the school where Permaculture is practised, places where workshops are held, as well as farmers' markets where farmers see one another's produce, ask and share how and why they are doing better in producing one crop over another.

Permaculture, an integrated land use design system that can be applied to create and maximize beneficial relationships between and among different elements of a landscape (Mollison, 1991), is one of the most commonly practised sustainable agricultural practices in southern Africa (PELUM, 1995, Mukute, 2001). The study is based on the Schools and Colleges Permaculture Programme (SCOPE) in Zimbabwe that was developed to promote, "sustainable land use of school and college grounds and homesteads in the surrounding communities" and the integration of ecological principles into the curriculum (Nyika, 2001, p. 125). SCOPE is a partnership between the government of Zimbabwe and the Zimbabwe Institute of Permaculture and has been operating since 1994. The fieldwork focused on and around St Margaret Primary School, one of the first two schools to be selected to participate in the SCOPE programme because it was one of the worst ecologically degraded. The Permaculture facilitators in the school teach and practise it in the school. They promote it in the community and in eight schools in the district.

2. THEORETICAL FRAMEWORK OF ANALYSIS

2.1 Cultural Historical Activity Theory (CHAT)

CHAT was originally developed by Vygotsky and his colleagues and further developed by Engeström. It builds on and addresses matters of praxis, reflexivity, dialectics, collective and adaptive learning (Mukute, 2008). Engeström's second and third generation CHAT

recognises and utilises structural and cultural factors in influencing and understanding learning. These are important and necessary qualities of a theory that must deal with sustainability and change oriented learning in an environment of uncertainty. Edwards (2005a, p. 50), who works with CHAT, defines learning as: “concerned with within-person changes, which modify the way in which we interpret and may act on our world ... and in turn change it by our actions”. Learning is mediated by the use of conceptual and materials tools. The incorporation of new knowledge and concepts into the individual happens first at the interface of the community and the individual through – **inter-mental**, and secondly within the individual, intra-mental (Edwards, 2005b). CHAT identifies three levels of learning: **scaffolding**, where the learner moves to the next level of understanding with the assistance of a more knowledgeable other; **cultural** where the more knowledgeable other links the novice’s everyday knowledge and scientific knowledge through instructional conversation, leading to mature concepts (Lave and Wenger, 1991; Engeström, 1999; Daniels, 2001; 2007). These two levels of learning are concerned with internalisation. The third layer of learning is **collectivist** and occurs when a group of people with different experiences and perspectives and working on the same object work on new problems and jointly develop new knowledge or tools to address the problems (Engeström, 1987, 1999; Lave and Wenger, 1991; Daniels, 2001). Collectivist learning covers both internalisation and externalisation and is also called **expansive learning** (Engeström, 1999; Warmington et al, 2005; Edwards, 2005b).

In this study I used second and third generation CHAT because they offer more suitable tools to work with open systems. Sawchuk (2003) explained an activity system as the minimal meaningful context for understanding individual action. An activity system consists of a group, of any size, pursuing a specific goal in a purposeful way (Peal & Wilson, 2001). Figure 1 shows a second generation activity system. This *triangle of mediates* shows how a subject’s understanding or transformation of an object is mediated by artefacts, rules, community and division of labour. A third generation activity system involves other activity systems interacting with a central one.

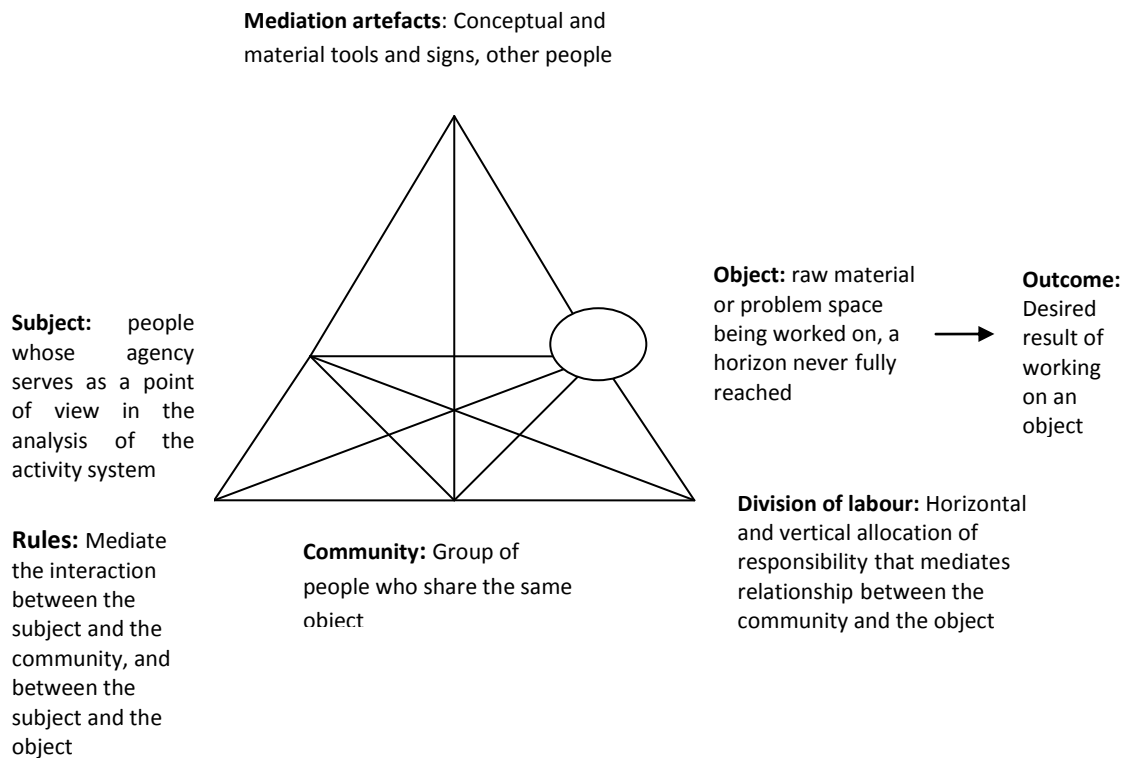


Figure 1: The Structure of second generation human activity theory mode

Adapted from Engeström, 1987

Engeström says the following **five principles** guide third generation activity theory:

- a. The **prime unit of analysis** is a collective, artefact-mediated and object-oriented activity system seen in its network relation to other activity systems;
- b. Activity systems are **multi-voiced** and are a nexus of many points of view, traditions and interests. Multiple layers and strands of history are embedded in the rules and division of labour. The multi-voicedness of the activity systems is a source of both tension and innovation;
- c. Activity systems take shape and are developed over long periods of time. This principle is called **historicity**. Activity systems should be analyzed in terms of local history of the activity, their objects and outcomes as well as in terms of the genealogy of conceptual tools that have shaped them over time; and
- d. **Contradictions** between and within activity systems are potential sources of change and development. They are *historically accumulated structural tensions* between and within systems. Activity systems are also seen as **open-ended learning systems** that can adopt new elements from outside, which can create contradictions.
- e. Activity systems have the potential for **expansive transformations**, which occur through relatively long cycles of qualitative transformations. Expansive transformation happens when the object and motive of an activity have been re-conceptualised to embrace much wider horizons of possibility than was the case in the previous activity system.

This study focused on how farmers (and Permaculture facilitators) are learning using the first four principles stated above. However, because CHAT has some limitations in relation to learning, I had to use other theories to complement it and a philosophical theory to ‘under-labour’ it. CHAT does not explain our unconscious actions in practice. The study used the **theory of habitus** to address this. It undervalues individual agency in learning and change (Ratner, 1999 in Daniels, 2001) by over-socialising the individual (Leesa, 2007) and relational agency (Edwards, 2005b). The study worked with Illeris’ model of learning which has a strong individual agency component while some aspects of relational agency were covered in how **positions in the field** influence learning. Lotz-Sisitka, Motsa, Mukute and Olvitt (2008) say constructivist forms of learning such as CHAT do not take adequate account of the effects of power that arise in institutions, or of normalisations that occur as power effects. The study used **critical realism** to obtain ontological depth and reach causal mechanisms, which are not visible but always there, underneath the activity systems.

2.2 Structure and agency

Benton et al (2001, p. 132) define structure as “relations between social agency in virtue of their occupancy of social positions” and point out that “structures are causally efficacious” in that they both enable and constraint actions. Through his transformational model of social transformation (TMSA) he demonstrates how agents can either reproduce or transform structures intentionally or otherwise.

Bhaskar points out that an individual learns from society and finds society in existence before him/her. The learning from society is called **socialisation**. Individuals in turn, after learning from society externalise their learning by acting on the world in ways that either reproduce or transform society (Bhaskar, 1994, p. 92). Bhaskar (1994) defines **agency** as the ability to respond to developments outside one’s immediate sphere of influence and produce intended consequences. Human agency involves **elaboration** (Bhaskar, 1994, p. 97). When individuals act on the world they exercise human agency (intentionally and otherwise). This results in transformation or reproduction of social structures. Social structures on the other hand either enable or constrain human agency. This leads us to the transformational model of society activity – **TMSA** (Bhaskar, 1994, p. 92). This aspect of critical realism provides a tool for understanding why people may not be incorporating sustainability in their workplaces, especially when they want to and will be used in conjunction with other structure-agency theories discussed below.

The theory of habitus explains practice and offers important insights into how the subconscious mind can support learning (Bourdieu, 1990). I used the theory because the study looks at a **practice** (Permaculture) and because it complements CHAT, by offering explanations for the unconscious actions that people may take and helps us understand the complexity of change processes (Lotz-Sisitka, Motsa, Mukute & Olvitt, 2008). Forrester and Hsun-Chih’s (2007, p. 261) explain Bourdieu’s concept of practice as “*a philosophy of action condensed in a small number of interrelated concepts such as field, positions, capital and habitus or dispositions. Basically, field is a social context where people are situated and practice, comprised of positions occupied by people. A field may represent a particular workplace or a non-workplace setting; it may also represent a context within or broader than a workplace ...When people undertake activities in a field or in fields, the capital related to their positions unavoidably interact through power relations which in turn influence human*

practice. Since learning is highly practice based, fields, positions and capitals influence learning”.

Hodkinson (2007, p. 403) says for Bourdieu, ~~the~~ habitus is made up of a battery of dispositions which orientate a person towards all aspects of life. They are embodied, incorporating the emotional, the physical and practical as well as the cognitive. Dispositions are thus at least partly tacit, and enduring, but can and do change. They are developed (learned) throughout life, but can be seen as social structures operating through the person.” Hodkinson (2007, p. 405) notes, ~~It~~ was not the fields or dispositions but the field and dispositions that resulted in particular ways of learning and participation. Practices are time and space bound, **„experience laden“** in the sense that much of what is practised is **tacit** or not made explicit but simply done, and therefore not easily interpreted from descriptions of them, and have an **improvisory and strategic logic”** (Bourdieu, 1990 in Lotz-Sisitka, Motsa, Mukute & Olvitt, 2008). Habitus implies a pre-intentional tendency. It is an underlying social structure shaping the way things are done (Bourdieu, 1990) and affects our every action. Particular social conditions produce particular forms of habitus. Bourdieu argues that the cornerstone of practice is the interplay between habitus and fields, the subjective and objective respectively (Forrester & Hsun-Chih 2007, p. 262).

Bourdieu cautions that dispositions may result in the reproduction of the status quo *“Thus the school institution, once thought capable of introducing a form of meritocracy by privileging individual aptitudes over hereditary privileges, actually tends to establish, through the hidden linkage between scholastic aptitude and cultural heritage, a veritable state nobility, whose authority and legitimacy are guaranteed by the academic title”* (Bourdieu, 2003, p. 22). This concern can be addressed by Archer’s concept of Morphostasis and Morphogenesis (M/M) through the dialectical interaction of structure and agency. A historical analysis of these tendencies can also reveal the same. The separation of and interplay between structure and agency leads to three accounts: one of structure; one of agency and a third of the interplay between them. This in M/M is concerned with linking rather than sinking the differences between structure and agency (Archer, 1998, p. 358). Social conditions are necessary for any intentional act. M/M, like TMSA says structure necessarily predates actions which transform it. This is a temporal dimension found in both (Archer, 1998, p. 359). Autonomy is temporal in the sense that structural properties are not the creation of contemporary actors. Pre-existence and autonomy denote discontinuities in the structuring and restructuring process which can be grasped by making analytical distinctions between the *‘before’*, the *‘during’*, and the *‘after’* phases (Archer, 1998, p. 359). Their causal powers establish their reality. The distinction (and not elision) between conditions and actions made have to be examinable separately in order to talk about conditioned action (Archer, 1998, p. 360). The pre-existence of social forms entail a transformational model of social activity. This is also linked to the three cycles in M/M the only difference being that in the latter, the after phase becomes the start of a new cycle (Archer, 1998, p. 361). The causal power of social forms is mediated through human agency. M/M holds that it is only partly true that the causal power of social forms is mediated through human agency because there are instances when this is not so, when the actions of the long dead have more causal power, for example, distribution of capital; human relations with natures such as greenhouse effects, puncturing the ozone layers and soil erosion (because past activities have made them chronic features of contemporary life). Concepts, say on gender, of the long dead may still carry weight in structures in spite of the current thinking about it.

2.3 Work identity, incentives and learning

Illeris (2003, p. 170) explains **learning** as “All processes leading to permanent capacity change – whether they be physical, cognitive, emotional, or social in nature – that do not exclusively deal with biological maturation or ageing”. He further argues that there are two layers of interaction in learning: between the learner and the environment; and the inner mental processes of acquisition and elaboration, through which impulses of interaction are linked to earlier learning (Illeris, 2003, p. 170). He regards “the dialectics between the social and the individual spheres as the most central feature of learning in work life” (Illeris, 2004, p. 440). Illeris brings two important dimensions into individual learning and performance which have a bearing on individual agency. Individuals have **emotions and motivations** that drive what they learn (or do not learn). Fundamentally, learning is a **desire-based** function (Furth, 1987 in Illeris, 2003, p. 173). Motivation to learn forms an important part of my study because it allows me to understand why some people choose to become farmers, agricultural extension workers or farm workers, while others do not. He argues that learning involves three dimensions: the cognitive, the emotional and the society, which interact to form work identity in the individual (Figure 2). His model treats the individual as a learner with a **specific life history, situation and future perspective**, different to those of others (Illeris, 2003). Commenting on identity and learning he says, “Through everyday consciousness we control our own learning and non-learning in a manner that seldom involves any direct positioning while simultaneously involving massive defence of the already acquired understandings and, in the final analysis, our own identity (Illeris, 2003, p. 172). Illeris (ibid.) notes similarities between identity and habitus but also spells out three differences: identity as a more accessible academic term; identity as a psychological term while habitus is a sociological concept; identity is generally seen as something that **we think, act and learn**, while habitus is something done to the individual, **the deposition of cultural and societal matters in the individual** (Illeris, 2004, p. 437). His model of workplace learning suggests that most learning takes place at the zone where **individual identity** overlaps with work practice. He also argues that learning involves both the conscious and subconscious, cognition (content) and emotion, that is, motivation or incentive (Illeris, 2004, p. 435). Illeris, 2003 suggests that it is easier for an individual to learn, when the learning does not involve a change in individual identity. For example, it should be more difficult for a painter to become a farmer (needing re-qualification) than for a vegetable producer to learn how to produce cereals (needing further qualification). It is also easier for someone who has no work identity (needing a basic qualification) to learn new work than someone who already has work and needs to change (re-qualification).

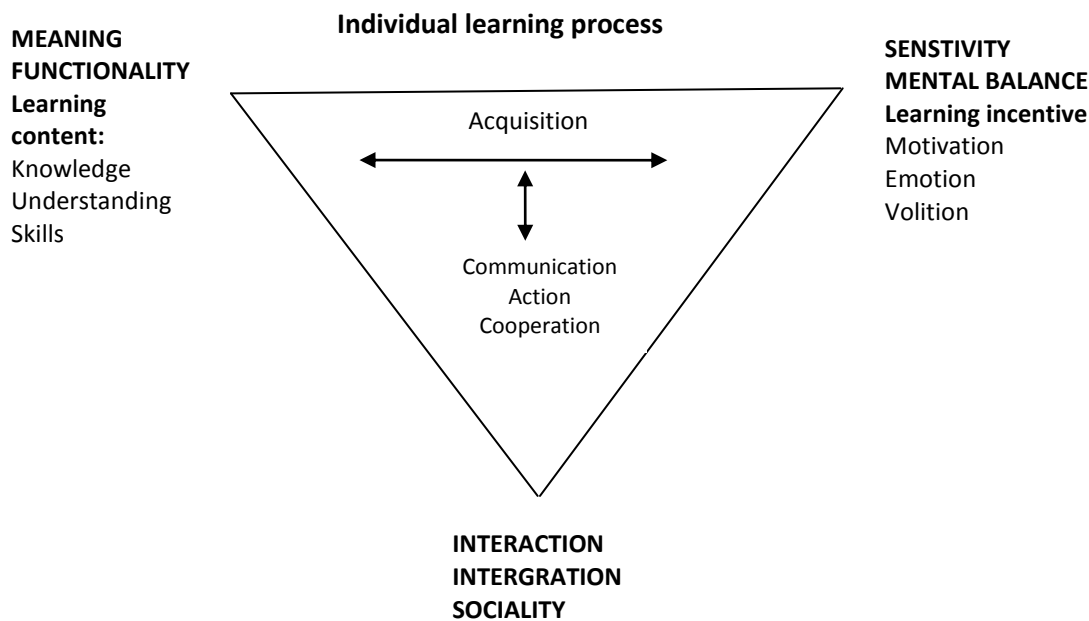


Figure 2: Individual learning processes

Adapted from Illeris, 2008

2.4 Critical realism

There are resonances between the critical realism and activity theory use of abstraction and description to analyse society, and the way both seek to identify underlying causal mechanisms rather than restricting and theorising of the world to that which we can see and experience. Moreover, both reject the positivist search for prediction, which is grounded in atomistic understanding of the social world and is based on the search for constant conjunctions of events rather than an analysis of causal mechanisms. (Leesa, 2007, not paged)

The philosophical position of critical realism is that there are **two realities**: one that is socially constructed and known, and the other that exist independent of our knowing of it (Sayer, 2000). Bridges and Smith (2007, p. 2) encourage the use of a philosophical framework to underpin or ‘underlabour’ research in social sciences. Similarly, (Archer, 1995 in Leesa, 2007) explains that ontology “acts as both gatekeeper and bouncer of methodology” because how society is held to be affects how it is studied. I used critical realism in the study because it is built on the ideas of reflexivity and dialectics, which are embodied in both CHAT and the theory of habitus discussed above, and which are central to learning with an emancipatory interest. I found the potential value of critical realism residing in its ability to provide an **explanatory critique**, with ontological depth, that goes beyond the actual and the observed to the **causal mechanisms** that are invisible, thus avoiding the fallacy of actualism (Lotz-Sisitka, Motsa, Mukute & Olvitt, 2008). Bhaskar notes that reality is stratified with the *empirical*, the *actual* and the *real* respectively (Sayer, 2000, p. 2; Benton & Craib, 2001, p. 125). This layered reality can further be divided into two groups, the transitive, which can be changed and the intransitive, which is nearly impossible to change. The ‘real’ reality is intransitive and is associated with the notions of power, mechanisms and tendencies (Benton & Craib, 2001, p. 124) discussed above. To illustrate that power is a

reality even though we cannot see it, Sayer (2000, p. 2) says, "... individuals, in virtue of their physical make up, socialisation and education, are able to work; indeed, they have the power even when they are currently unemployed and idle." The actual refers to what happens if and when the powers are activated. For example, labour power may be activated, resulting in someone working. The empirical is in the experience domain and is observable.

This realism is critical because it:

- Is committed to changing unsatisfactory and oppressive realities;
- Recognises the independent existence of objects of scientific enquiry;
- Is based on *reflexivity* about possibility of thought, or language to represent something outside itself;
- Assumes that the surface appearance (empirical) is potentially misleading and insists on *getting beyond or behind surface appearances*; and
- Our knowledge of the natural and social world is both fallible and provisional because our experience of the world is always theory laden and always be open to correction in the light of further work such as dialogue, experiments, interpretations and observation (Benton & Craib, 2001, p.120-121; Sayer, 2000).

Critical realism assumes that social structures and individuals that occupy them exist independent of each other but interact dialectically in such a way that the structures may be either reproduced or transformed (Benton & Craib, 2001, p. 132).

3. METHODOLOGY

I used a **case study** research design because the study sought to understand social phenomena within naturally occurring settings: farmers practising, learning and enhancing sustainable agriculture. I chose SCOPE as a case study purposively as one of the relatively successful and well established examples of how sustainability is being learnt, lived and reconstructed in the workplaces. The approach also resonates with critical realism research approach that uses intensive research, which is often associated with case studies. Activity systems which are found in CHAT, lend themselves easily to case studies. Case studies involve intense analyses and descriptions of a single unit or system bound by space and time. The researcher uses them to gain an in-depth understanding of something. Insights gathered in this way can be used to influence policy, procedures and future research (Merriam, 2001). They entail doing research on contemporary phenomenon within its natural context using multiple sources of evidence (Yin, 2003). A case study is richly descriptive and uses quotes from research participants, anecdotes, prose composed from interviews (Hancock & Algozzine, 2006, p. 16). Case studies can be used to study events, programmes, situations and activities (Hancock & Algozzine, 2006). This research study looked at an agricultural programme and the learning and farming activities in it.

The study was informed by the **Developmental Work Research (DWR)** as a mechanism for expansive learning also referred to as a methodology for expansive learning as developed by Engeström and Middleton (Warmington, Daniels, Edwards, Brown, Leadbetter, Martin, Middleton, Parsons & Popova, September, 2005). The methodology uses contradictions as important potential sources of learning, which serve as the starting point of the expansive learning cycle, which is built on the strength of double action, double reflection and double modelling in one cycle (Brall, 2007, p. 91-92). I used activity systems to analyse data and bring out the contradictions; and the three kinds of learning found in CHAT (See 2.1).

Further, I used **Illeris**'s **framework of learning** to analyse identity and individuals' motives for learning and practising sustainable agriculture. I employed **Bourdieu**'s **concept of practice**, especially the theory of habitus to analyse subconscious factors that drive farmers to want to learn and practise sustainable agriculture, and used his idea of positions in the field to find out how relational agency may be playing out in the case study. I also employed Bhaskar's concept of explanatory critique to analyse **causal mechanisms** for the incorporation of sustainability in farmers' workplaces.

I held **three** individual semi-structured interviews with Permaculture facilitators who have been and are involved in facilitating the learning of Permaculture in Zimbabwe and **two** group interviews: one with 3 teachers who promote and practice Permaculture and another of 4 farmers who practice it. All 6 educators were male and among the 4 farmers, 2 were female. The teachers work at St Margaret School in rural Hwedza, while the farmers and one interviewee, a former teacher at the school live near the school. The remaining two interviewees are the SCOPE Materials Development Manager and a SCOPE founding member both met in Harare. Individual interviews lasted 1 to 2.5 hours, while group interviews took about 2 hours each. I took notes in the field and typed them up soon after when my memory was still fresh. I sent them to interviewees for checking and received some feedback. I coded the names in order to protect the anonymity of the research participants.

4. FINDINGS

4.1 Why are farmers incorporating sustainability in their workplaces?

4.1.1 Farmers are motivated by various factors to learn and practice Permaculture

The study revealed that farmers embark on sustainable agriculture for different reasons, which are:

- a. It is low-input cost and then can therefore afford it;
- b. It conserves water which has become scarce in their areas during certain times of the year;
- c. It produces food which is healthier and safer for consumption;
- d. It encourages them to become self-reliant through own production of some of the seed, through less dependence on the agro-companies and on other people's draught power; and
- e. It has the potential to build the productive potential of their gardens and homesteads. The latter motivation works for those with a certain amount of certainty of tenure because they see it as an investment for their families. The identified incentives were linked to some form of personal gain, which also had common good.

However, there have been instances where people have attended training not so much to learn about Permaculture but to make money from allowances:

The other challenge is that some people who come to attend the courses are less interested in the knowledge to be gained. They are more interested in money, which we often do not have to offer (Interview #Z1).

4.1.2 Climate change, HIV and AIDS, poverty and environmental consciousness underpin farmers' interest in sustainability

Causal mechanisms explain the events that are taking place in the case study, specifically deeper reasons why the 'SCOPE community' is practising Permaculture. They are not themselves visible but their effects are. The main causal mechanisms appear to be risks associated with **climate change** which manifest itself through unreliable and diminishing rainfall in the area, forcing people to opt for water saving agricultural practices; growing **environmental consciousness** which has allowed farmers to question the appropriateness of current land management systems, which poison people, the land and water; **threats to health** and **health consciousness** triggered by exposure of the population to HIV and AIDS, which needs healthier foods and herbs. In some cases, **poverty among farmers** has encouraged them to take on agricultural practices that require minimal external inputs. The steady growth in the number of educational and agro-ecological agriculture NGOs in a space where government budget for agriculture and agricultural extension services is declining has enhanced the *power and influence of such NGOs*. **International environmental thinking** and policies, which influence both NGOs and governments, underscore the need to look after the environment for current and future generations.

4.2 How do farmers learn about sustainable agriculture in their workplaces?

4.2.1 Farmers are primarily learning through scaffolding, through linking everyday and scientific knowledge but show little evidence of expansive learning

The five interviews held with ten people in SCOPE suggest that the main form of learning that is taking place is scaffolding: Permaculture facilitators training teachers, parents and students in Permaculture; more established farmers helping newer farmers to learn about farming in general; use of the market place to learn from other farmers and exchange of knowledge and planting materials between community members as well as between community members and the school; and farmers helping their children learn. Farmers' interviews showed how they are now producing more manure from banana leaves after learning. Farmers have enhanced the use of space through practising relay and intercropping. However, there does not appear to be a deliberate strategy to keep improving the activity system by looking at all the elements and modelling new solutions to emerging challenges. Farmer responses suggested that Permaculture training allowed them to link their everyday knowledge with scientific knowledge as the response below illustrates:

In the past we were made to believe that crops couldn't grow properly if you do not apply chemical fertilizers. Permaculture taught us that it is possible and desirable to use organic fertilizer, which also improves the soil. You see that our soils are very heavy. They are clayey. With some organic manure, we improve it. Organic fertilizer is made from locally available resources. You see the banana leaves you are sitting on: in the past we used to leave it to rot, which was good for some plant and animal life but we did not use it enough for production. Now we produce more manure because we take it to the kraal and we have increased the volume of manure about fourfold as a result. This has increased production and productivity in the garden (Interview #Z2).

Some of the key problems that need innovative solutions in SCOPE are:

- a. Farmers do not have access to resource materials in their local language;

- b. Farmers hardly get any learning materials, even in English;
- c. There is not enough time allocated for farmers to learn Permaculture because the courses run for a week only;
- d. Inadequate economic resources such as funds restrict possibilities of learning; and
- e. The relatively low literacy rates limit the learning methods available to farmers.

4.2.2 Farmers are mostly learning through practical activities and seem to prefer it that way

Table 1: Comparison of learning methods used by Permaculture facilitators and farmers

Learning processes or methods used for teachers and facilitators	Learning processes or methods used by farmers
<ul style="list-style-type: none"> • Learning from peers • Learning from practice (transect walks, biological assessments) and practical work; • Learning from watching TV, and PowerPoint presentations • Learning through group discussions and group activities • Learning from examples and demonstrations; • Learning through research; • Learning through assignments • Learning through reading handouts and other forms of literature • Learning through lectures. 	<ul style="list-style-type: none"> • Group discussions, • Lectures • Demonstrations • Doing/practicals/hands-on • Field visits and sharing successes • Sharing plant materials • Enquiring from each other (farmer to farmer learning) • Trial and error (context-specific)

Table 1 suggests that farmers generally learn through experiencing, doing. This means that, through practical learning, they acquire tacit knowledge, which is difficult to put in words but can be learnt through observation and doing (Maree, 2007, p. 587). A practical approach seems suitable because many of the farmers are not highly literate, which makes formal instruction difficult. The learning processes that farmers use as identified in the study tend to favour the sharing of what Gamble calls practical knowledge, which is context-dependent and generated in the course of human action (Gamble, 2006, p. 89). One Permaculture facilitator said:

In teaching farmers, I find the practical approach better because it sticks in the head. People can work with real things. The structures they build are visible and can be permanent. Compost making is a good example. Some of the farmers have not gone far with education. But they can follow you if you demonstrate. Instead of describing how you dig a hole, you do it and they do it. It is hands-on (Interview #Z3).

The danger of this approach (See 4.2.1) is that the farmers may continue to receive knowledge on the *profane* and not the *sacred*, practice without theory. Hodkinson, Hodkinson, Ford and Hawthorn (2007, p. 398) argue that people’s identities tend to affect their learning preference: *–The strength of his working class identity can be seen in his rejection of white collar work in favour of manufacturing. His clear preferences for learning on the job are shared by many other working class men.*” This suggests that farmers would be expected to prefer learning on the job. However, this approach can lead to reproduction. Permaculture facilitators on the other hand, have more options of learning processes open to

them. This is partly because of their higher general education, which means that theory-based learning can also be used. They thus have access to both context-dependent and context-independent knowledge. The latter is knowledge generated in a context of thought through inductive and deductive methods (Gamble, 2006, p. 89). She (Gamble, 2006) notes that for vocational education to be effective, it must carry both the general (theory) and the particular (practice).

4.2.3 Time and space are both enablers and constraints of learning among farmers and facilitators

Time and space are important assets in the development of a practice and this is manifested in several ways in the activity system. There is need for time to teach and learn different aspects of the practice.

Time limitations mean that we cannot cover some topics adequately. The topic that suffers most is often ‘know your elements’. There is so much that has to be shared on this topic. For example, if one looks at the school building or house as an element, one sees many functions that cannot be covered during the course because other elements must be discussed. The roof is good for water harvesting; the walls reflect sunlight, which is important for plant growth. The later concept takes time to drive home to the participants. Then when it comes to herbs, there are so many of them, with so many functions. We can only cover so many during the week (Interview #Z5).

Evidence suggests that two weeks is too short and two years is ideal for building not only the necessary skills and knowledge but also the confidence to try new things. Time is needed to build and manage agro-biodiversity in a locality (physical space) in the garden, the homestead or field. For example, the pest-predator relationships need to be balanced and it will take a number of seasons to achieve this in many areas. Time is also important for one to understand not only the different elements in the agro-ecosystem but also how they relate with one another. The study also revealed that it takes time to recharge water tables and make the results visible. This statement by a Permaculture facilitator underscores the value of time in developing and mastering a practice:

The challenge is that there are a lot of novices promoting sustainable agriculture, who must get their act together to offer more comprehensive education and training.

The main challenge is that it takes time for the results to show. Farmers are used to quick results and conventional farming is very good at that. PC feeds the soil so that the soil feeds the plant and it takes a while to build good soil. With chemical fertilizers, you can just buy today and apply the following day and changes will show in a few days. Some of the benefits in PC are not visible, at least not in the immediate future.

It is difficult to put PC into practice because it takes time for people get hold of it, to have the confidence to put it into practice. Confidence comes from doing things again and again. The danger is that you could fall in love with the theoretical concept, and not practice it... Some people try to put in too much diversity too soon. It needs more training than two weeks (Interview #Z4).

A phenomenon that combines space and time is that of seasonality. It includes space in the sense that there is a particular kind of rainfall pattern in a given area, which gives rise to seasonality that either enables or constrains the practice. The rainfall comes during only certain times of the year. This creates challenges of water availability, which is critical for

agricultural production. Farmers produce fruits and vegetables and wheat during the cold, dry seasons and rice during hot, wet summers when their gardens get waterlogged. Seasonality has also resulted in people not herding their cattle in the dry season, which means that fields and gardens that are not fenced off are vulnerable. In Permaculture maximum utilisation of space is an important principle, especially in urban areas. Vertical space is utilised by planting crops that grow to different levels together, if they can be companion plants. Different spaces afford different opportunities because of soil qualities, water availability, and market access and local regulations.

4.2.4 People with a farming background are more inclined to learn about it

I was born to a farmer. I grew up farming. I tried other jobs but found that they were not good for me so I returned to farming. I have been farming since the 1980s.

I have never known any other kind of work in all my life. I went straight into farming soon after completing my O' Levels. I used to visit my uncle who was an employee somewhere and I did not like the way he was treated by the employer and his children. Not much respect for him (Interview, #Z2).

The above responses suggest that some farmers become farmers because it is a family trade; they are born into it and grow in it. Using Illeris' concept of *identity* and its associated idea of *defence* of what is in the identity of the individual, there is a hint here that these two farmers were defending their identity as farmers' offspring and therefore as farmers, lending credence to the notion of "like father like son" at the same time.

4.2.5 Work affordances shape learning and identities of farmers and facilitators

By embracing sustainable agricultural practices, when they grew up working with and privileging conventional farming, the two farmers made a shift in identity, which can be attributed to their interaction with society: the sustainable agriculture promoters, the growing prices of fertilizers and other chemicals, the declining rainfall (chemical fertilizers require more water) and the living example of successful Permaculture at the nearby school. Similarly, the responses of their spouses, who are also farmers, suggest that one does not have to be born in a farming family in order to become one. Instead, the responses indicate that affordances can cause people to develop new practices through their own agency and that of others as the responses from two female farmers suggest:

I found my husband farming and just joined him.

Same applies. I found the going tough in the beginning but I am used to it now (Interview #Z2).

The three primary school teachers in the study were professionally trained in teaching children and not adults. One important part of their training to become Permaculture facilitators was on adult education. They said that through working with adults for a long time, they have become confident to teach adults thus suggesting a shift in identity:

I have also learnt about the kind of humour that works with adults. It is quite different from that which pupils prefer in class. I have also learnt that adults are motivated differently from

children. The supervision of adults and that of children is completely different. An adult can tell you *_pfutseki'* [voetsek] and leave the workshop. My tact in working with adults has improved over the years as a result of promoting PC in schools and communities (Interview #Z5).

I have grown in confidence over the years from teaching the same things again and again. I have taught primary school children, parents and university students. When I teach university students, I feel that I should be more prepared and this forces me to master things better (Interview #Z5).

4.2.6 Low economic capital limits farmers' and facilitators' learning processes and time

Drawing on the work of Bourdieu (2003), 4.1.3 (c) above suggests that *economic capital* can be an important enabler or constraint for the acquisition of *cultural capital*, that is, education is sustainable agriculture in this case. The limited economic capital of NGO prevented them from developing the cultural capital of trainees in the manner that they wanted, forcing them to invest less time in individual learners – two-week training workshops and limited post-workshop support, inadequate resource materials production and distribution. Permaculture facilitators and farmers alike do not have the necessary financial means to support long-term training, let alone short-term training.

4.2.7 Position in society determines those *with whom* farmers learn

The subject-related tensions are concerned with farmer position in society and what those positions afford them. Farmers cannot afford long-term training, lectures and text-rich materials because their position and associated ecological capital has not allowed them adequate access to formal education and they could not afford to pay for training either. The social proximity between farmers allows them to learn effectively from each other, through farmer to farmer extension. However, challenges arise when the agricultural/sustainability value systems among the farmers are different and far apart. For example, those who value immediate profit and those who want to invest in building the soil and biodiversity that take time, will find it difficult to learn from each other.

4.3 What are the main features of the SCOPE activity system?

This paper treats SCOPE case study as one activity system. It is constructed based on the perspectives of farmers practising Permaculture in the study area; teachers who are Permaculture facilitators in their school, community and district; and trainers of facilitators (Figure 2).

Mediating artefacts: Parents, fellow farmers, government and NGO extension workers; copying and comparing; trial and error, learning workshops; theme-based handouts; books and other publications look and learn visits; observation; follow-up visits; seeds and other planting materials; irrigation equipment; farm implements; water; manure; school, centre and home grounds; PC courses; Permaculture 'curriculum', evaluations TV, films, PowerPoint projector, charts and diagrams, lectures, group discussions, group activities, biological assessments; transect walks; demonstrations; group assignments; practical work; nurseries, gardens and field; natural environment, water tank; water pump; gardens, fields and farmer markets; draught power, funds; power & authority

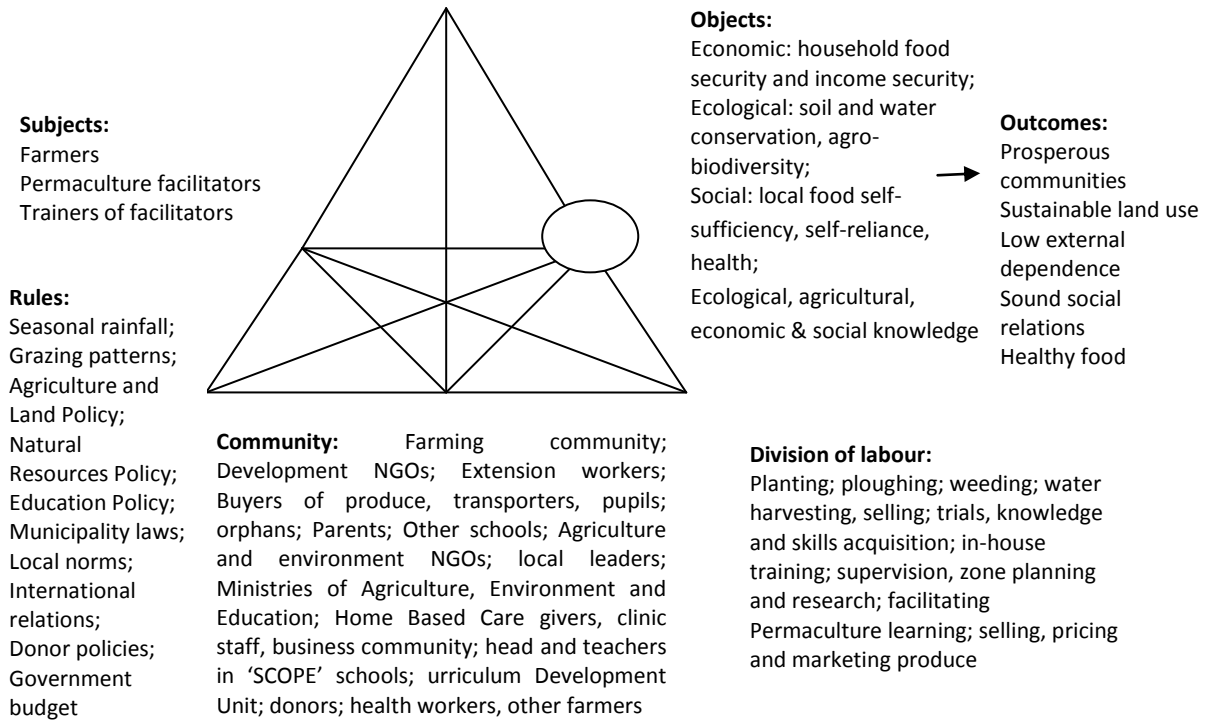


Figure 2: SCOPE activity system

4.4 What are the learning and practice limitations and contradictions in SCOPE?

Contradictions are a potential starting point for expansive learning by providing „mirror data‘. Some of these will be determined by farmers in subsequent field work but I needed to pull them out of the interviews to obtain a **systemic perspective** as a researcher participant. It is likely that research participants will bring **partisan perspectives**, something normal and expected in a multi-voiced activity system (Engeström and Miettinen, 1999, p. 10). In addition, I drew the contradictions from a wide range of people, some of whom are not likely to take part in the Change Laboratory workshop, scheduled for the next round of field work. Below we discuss learning and practice limitations and contradictions.

4.4.1 Educational materials in Permaculture are largely unsuitable for farmers.

Farmers are facing several educational material related challenges in SCOPE. These challenges include inadequate resource materials for learning Permaculture, non-use of local language in the resource materials, as well as use of English which is difficult for the farmers to grasp. In addition, the learning is generally weak on answering the why of learning and practising Permaculture. The statements from Permaculture facilitators support this point:

The other challenge is that the language in the handouts is too advanced for the readers. It may also need simplifying in English. The language is for intellectuals. Participants have to rely more on listening to the facilitator.

I read documents on PC that were written by Bill Mollison and I found the early books quite complex.

The materials we used for training was basically tailored for trainers not for farmers. This is a problem not only in sustainable agriculture. It is a general problem.

The number of handouts per course is falling.

I would like to produce some of the materials in the local language because most of the ultimate users would find them more useful. I would also like to include more visuals in the materials than is the case now because visuals help people understand ideas better and faster (Interview #Z4)

4.4.2 Farmers are getting confused by ambivalent messages

The agricultural advice and messages that farmers are getting from SCOPE and from the mainstream agricultural institutions, which are supported by government policy at various levels, are often conflicting. This is worsened by the fact that the education system hardly pays attention to sustainable agriculture.

We have in the past experienced clashes with AREX staff who promote agriculture with different principles from those of PC. Fortunately, more recently, the curriculum of agricultural colleges includes sustainable agriculture. So the clash is less frequent now, especially with new graduates. The old guard still poses problems though. The problem remains that when we talk about the bad effects of agro-chemicals we appear to undermine what AREX generally promotes.

One major constraint is the education system, especially the teaching of agriculture – because it comes from a different premise, which is high external input (Interview #Z4).

4.4.3. The learning of sustainable agriculture is currently under-resourced

Agricultural support for farmers in Zimbabwe and in SADC is generally low by international standards, which is why SADC countries have committed themselves to increasing the budget to 10 % of their national budgets. This has left agricultural extension services in the country under-resourced and understaffed. Agricultural NGOs promoting sustainable agriculture are occupying some of the space but they are too few and far apart to cover the country. Then in those areas where the NGOs are, their resources are declining because of the poor relations between the country and the donor community. Even when it was established that longer-term training would be more effective, it was not possible to pursue the option because of limited resources. In many instances, NGOs cut on time and resources leading to negative effects on the learning of farmers as responses below indicate.

Nevertheless, we trained a number of groups, three or four, each with about six trainees. This was another constraint, the cost. A trainer had to work with only six trainees at a time (Interview #Z4).

The issue though is how do you pay for that kind of education, awareness, which is where the sustainability lies? (Interview #Z4)

Finally, a key limiting factor is resources to support the learning, implementation and follow-up processes. Right now we have worked on one cluster in the District and do want and need to move to other clusters but there are not resources for this (Interview #Z5).

The current political and economic environment has resulted in the contraction of our activities. When we change funds from donors, we can hardly do with it, what we planned to do (Interview #Z1).

4.4.4 Inadequate time allocated for learning agriculture compromises the depth of learning

The learning of Permaculture is constrained by limited time to learn its different aspects, including details of useful connections and relationships, species functions and more importantly the reasons behind the ways it is done. Facilitator courses last two weeks while those of farmers last a week. Two-year courses conducted on Permaculture previously demonstrated that the graduates not only mastered the practice but were also willing and able to experiment with Permaculture.

Two weeks is not enough. This is why we developed the idea of an apprenticeship programmes where people learnt and implemented PC for a period of two years. One of the challenges was that the training was not registered with the relevant ministry so people were not very keen to do the course and not get a recognised certificate in the end.

Basically, we came to recognise that the two-week courses are not enough to allow one to master the different concepts of PC or other sustainable agriculture practice (Interview #Z4).

4.4.5 Lack of accreditation of Permaculture training discourages potential extension workers

Effort to register Permaculture training with the relevant ministry failed (see 4.4.4). This means that youths who were interested in pursuing this course and get a recognised certificate at the end of the training would have to choose a different course of learning. The implication on farmer learning is that most of their training on Permaculture is conducted by “_novices”. Consequently the depth of their learning is also compromised.

4.4.6 Limited mechanisms to facilitate farmer to farmer learning and collective problem solving

Farmers do not have the mechanisms to meet regularly in order to learn from one another and to collectively develop solutions to issues that they are facing. This means communities of practice are hardly existent and where they are, there is often an NGO behind them. When the NGO leaves, the group often ceases to exist. There seems to be need on the part of farmers, to develop mechanisms that allow them to learn throughout their careers. The statements from a Permaculture facilitator and a farmer respectively speak to the limitation.

One of the keys is to try and get farmer education happening among farmers on a continuous basis. Farmers need to have their own study groups. There is need to develop a culture of learning at farmer level. This is how farming improved in Europe in the late 1800 and 1900. The idea of folk school in Denmark is a case in point. It supports ongoing learning among small-scale farmers (Interview #Z4).

There is one kind on investment which is very important but which people tend to undervalue. This is investment in relationships and socialising. It is from these relationships that we learn to move forward. You came here. I establish a relationship with you. I learn from you and you learn from me. Sometimes we must spend money in order to learn, spending it to travel and meet such people (Interview #Z2).

4.4.7 Within Permaculture farmers have to balance economic, social and ecological sustainability matters

The study revealed that farmer practise Permaculture in order to achieve several outcomes and objects which can be clustered around the three main dimensions of sustainable development: tensions exist between the social, economic and social dimensions of the practice. The main current limitation of Permaculture is the economic aspect, followed by the social as the table below indicates:

Table 2 Showing scores of Permaculture against three objects

Sustainability	Ecological	Economic	Social
Interviewee			
Farmers' score (4)	10	8.5	9.5
JW	9.5	7.5	4
LM	10	5	6
CM	10	5	9
MY	10	4	8
PS	10	9	8
AM	9	9	7.5
Totals (out of 70)	68.5 = 98 %	48 = 67 %	52 = 74 %

In addition, there is an absence of viable Permaculture-based agricultural farms in Zimbabwe undermines its credibility and discourages profit-driven farmers from adopting it as two Permaculture facilitators said in separate interviews:

It [Permaculture] does not compare well with conventional farming where crops can grow rapidly and generate income (Interview #Z3).

The second main challenge is the absence of Permaculture farms that are run commercially. All the examples we have are small-scale and mainly for domestic consumption (Interview #Z3).

Right now I am working on a handout on income generation activities through the production of mushrooms and beekeeping (Interview #Z1).

4.4.8 Permaculture is a practice that takes a long time to establish

When compared with conventional agriculture, which is the predominant agricultural form, sustainable agriculture and indeed Permaculture has been seen as taking too long, something farmers are not prepared to invest in. This long-term orientation manifests itself in building soil, biodiversity, pest and disease control, water capacities of the farms over long periods of time. One Permaculture facilitator put it this way to illustrate the point:

The main challenge is that it takes time for the results to show. Farmers are used to quick results and conventional farming is very good at that. PC feeds the soil so that the soil feeds the plant and it takes a while to build good soil. With chemical fertilizers, you can just buy today and apply the following day and changes will show in a few days. Some of the benefits in PC are not visible, at least not in the immediate future. An example is recharging water tables through swales and other water harvesting techniques. If a farmer has a pest problem and you give him a pest repellent, he is not satisfied to see the aphids run away. He/she wants them dead. That is what they are used to (Interview #Z3).

4.4.9 Government policies generally constrain sustainable agriculture

The pricing system of agricultural produce in Zimbabwe discourages sustainable agriculture practices. The prices for agricultural produce in Zimbabwe do not take into account the fact that Permaculture, unlike conventional farming, does not harm the environment. This makes conventional farming more attractive to a farmer interested immediate high economic returns. In addition, government policies on some sustainable agricultural practices have been conflicting over time. For example, environmental laws which initially prohibited wetland cultivation but subsequently allowed and rewarded it as illustrated by a response from one farmer:

We planted bananas as a way of protecting the river bank, when in fact the government regulations were that we should not plant anything within a certain distance from the river bank. In 1992, the Natural Resources Board officers fined us for breaking the law. However, in 2004, the same authority awarded us a national prize for effective conservation practices for looking after the same river bank using the same methods for which it had fined us (Interview #Z3).

The agency of SCOPE as a Permaculture promoter is both enabled and constrained by government policy. By allowing schools to take on Permaculture, the government played an enabling role. However, the government policy in education or in agriculture has not committed the necessary funds to bolster the efforts of those schools to take on Permaculture. Nor has the government set up colleges or training centres on sustainable agriculture.

4.4.10 Permaculture lacks appropriate tools to support its growth and development

Permaculture is labour intensive. Its development has not been accompanied by the manufacturing of appropriate tools to ease the burden. This means that farmers have had to apply it on relatively smaller pieces of land. The need for appropriate physical tools has also been underscored by the increase in the number of the sick, old and young who have relatively low energy having to be farmers themselves.

Sometimes I have problems finding enough people to provide labour on my farm (Interview #Z3).

In addition to not having enough appropriate tools farming, Permaculture has not developed suitable systems to manage livestock so that gardens are sufficiently protected from goats, cattle and other livestock which undermine the development of the practice.

The whole livestock thing is difficult. It is difficult to do whole land designs because in the dry season, animals roam freely and one cannot protect trees and other vegetation from being browsed.

Then there are a number of schools that are not fenced or protected from livestock. In the dry season, goats and cattle roam free and feed on the crops and fruits planted in schools (Interview #Z4).

In talking to the farmers and observing the garden I was struck by two developments: they were producing vegetable seed; and they had designed a system of saving labour by using gravity to carry water from the well to different parts of the garden. There was a drum at the water source into which they poured the water and from which it would flow into the channel. One of their dreams was to buy a petrol pump, which would create a small carbon economy in the garden and undermine their sustainability efforts. While their own seed

production resonated with the idea of self-reliance implicit in economic and social sustainability, there was still need for proper training to ensure quality seed produced which is a good foundation for crop production.

4.4.11 Poverty, HIV and AIDS have dual and conflicting effects on Permaculture practices

On one hand HIV and AIDS creates a new group of subjects who are weaker and therefore less able to do some tasks. On the other, it creates demand for its produce because it has low or no chemicals, and good nutrition compared to that produced elsewhere. On one hand, the study identified HIV and AIDS as the main subject-producing activity system, leading to the creation of child-headed families, widowed and sick farmers, which undermine the scaling out of labour-intensive Permaculture. The pandemic also altered the division of labour by forcing the many orphaned children to do adult work. And many of them just need community support for food and education. Poorly resourced farmers can afford to practice it because it is based on locally available resources. However, the same farmers do not have adequate resources to sponsor their training so that it is deep enough for effective practice.

4.4.12 Soil and climatic conditions under which Permaculture is being practised are not favourable

During the colonial period in Zimbabwe, most small-scale farmers were pushed to marginal lands where rainfall was relatively low and soils were poor. The farmers in the study live in a former ‘reserve’ or communal area, which suffer this fate. This means that it takes more effort and time to build to soil in such areas, which in itself requires good moisture to help decomposition. These limitations slow down the pace of the growth of the practice and make it preferable for farmers to work with conventional farming which feeds the crop.

The two main problems are not getting enough manure to support the production of crops; and the limited availability of water, especially in the dry season (Interview #Z1).

5. CONCLUSION

The study revealed that time is a fundamental consideration in learning and in building practice. Time is needed to learn new things, to internalise them into the memory and to try them out on the world, to understand phenomena and transform of objects, to build the confidence to try new things. More time is needed to achieve learning that includes a change in identity, for example, from a maid in an urban area to a farmer, compared to someone who has some prior knowledge or has a subconscious understanding of the subject. Time is also critical for building sustainability in agriculture in terms of soil fertility, agro-biodiversity, managing the diversity, utilising the different spaces, and water conservation.

The second major revelation from the study is that in order to make Permaculture a more attractive agricultural practice, its economic potential needs to be developed further and made more explicit. SCOPE did some work to improve the rather limited social dimension of Permaculture by borrowing from holistic goal formation and participatory approaches.

The study provided some insights into how farmers and Permaculture facilitators in the Schools and Colleges Permaculture Programme (SCOPE) are learning, promoting and practising Permaculture in their schools and communities. It also identified and analysed the learning and practice limitations and contradictions. Contradictions will provide useful input as ‘mirror data’ in the second phase of research when I use Change Laboratory Workshops to engage with expansive learning to address the remaining two research questions, which form

the backbone of my study (thesis). The analysis of contradictions will draw on critical realism's deep analysis of causal mechanisms.

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2.5.1 Example of feedback on the report

Hi Mutizwa

A pity, I'll miss you in December as I leave for the UK on the 8th and not back until about 10th Jan. thanks for the note plus paper. I've had a very bad flu (second time in my life that I've had flu as opposed to a cold; the last was in England in 02) the last couple of weeks, getting a bit better and then being knocked for six the next day and so on. This has allowed me to do lots of reading, which is the silver lining. And part of today's reading is your paper!

- There has been something funny about the terminology in your study that I haven't been able to pinpoint and now I realize it's to do with the idea of looking at „farmers in their workplace“. You mean their farms, which are also their homes. Of course it is their workplace but it just sounds strange when you put it like that; it's too urban a term for a rural setting. I wonder if other readers won't find it like that? How do you separate the workplace of a smallholder farmer from their home? Is this not the kind of „separation“ or reductionism we should avoid? Which takes my thinking on to what is Permaculture and it's not just about the fields (the „workplace“) it's about the whole farm, the whole homestead all linked together by good design (even if homestead and fields are not contiguous...)...this may be an interesting line for you to take, I'm not clear, just hints/flashes.
- My mind is still too foggy for the early theoretical parts of your paper, though they look interesting; I'll leave those for your academic colleagues to comment on. Turning to the findings...
- I like the way the „time“ issue has come through and I think you could maybe put more about need for more comprehensive training programmes (I think there's a huge potential for distance learning programmes, where distance learning provides back up to localized peer-to-peer type learning).
- The other thing that crossed my mind the other day is that I think it will take a generation to learn „Permaculture“ skills, attitudes and knowledge, to really know them; thereafter they can pass from generation to generation but we have a huge amount of work to embed such competency. It's about a different paradigm and no amount of wishing will change the time it will take. The big challenge therefore is making the transition, how to put/initiate/catalyse lifelong learning around a new paradigm (not so new compared to traditional agriculture though some new things certainly, but new paradigm vis-à-vis conventional land use/agriculture based on reductionist science rather than holistic science). One could argue that it won't work because it will take too long but it HAS to work because we have to learn to live sustainably; so the time thing has many dimensions.
- It's interesting the way that I was the only one to score Permaculture low on the social side. I think you point out why in your conclusion and this could come earlier. In fact SCOPE uses the ILUD process which, in the spirit of „pelum“ combines different approaches. At the heart is Permaculture but the process includes participatory methods and visioning/holistic goal formation.
- When you say Permaculture hasn't developed suitable systems I would say rather that there are not enough working examples yet. Permaculture is a design framework, it doesn't have systems, these have to be developed locally in each unique situation; certainly these can draw on working examples; and I think that that is a weakness, there are not enough working examples of good Permaculture in practice; one could

stretch things and say all land is Permaculture in practice because there has been some design/planning but most examples are bad examples.

- 4.4.12 could be fuller and I think there's a challenge in applying Permaculture to seasonal rainfall areas and integrating it with grazing management approaches (I think you make this point somewhere - it's a long paper!). In many ways places like southern Uganda, western Kenya and Kenyan highlands are the ideal places for Permaculture not the seasonal rainfall areas of southern Africa i.e. ideal in terms of quick results/straightforward applicability

- There are good points in your conclusion but it is not yet the punchy bringing-together conclusion that it could be, yet.

- There are a few comments then; I'm not sure if they answer what you asked; if not put it down to my weakened state.

All best
JW

2.6 CHANGE LABORATORY WORKSHOP LABORATORY REPORT ON CASE STUDY 1 MARCH 2009

1. INTRODUCTION

Change laboratory workshops are used for empowering participants to tackle the problems they face, with guidance and assistance from a researcher who helps them through use of double stimulus. The first stimulus that is used consists of the problems or contradictions found in a practice or activity system and the second stimulus includes tools that can be used to understand and analyse the problems in order to find effective solutions to them. The problems that the workshop sought to address were derived from group discussions during the workshop as well as from interviews that the researcher held with farmers and Permaculture facilitators six months before. The tools for scrutinising the problems and developing solutions to them were the activity system and the expansive learning model. I worked with a research assistant to help with note- and picture-taking during the four-day workshop, which was held in the school located in rural Hwedza south-east of Harare. About ten days before the workshop I had been to the Schools and Permaculture Programme (SCOPE) offices in Harare, an organisation that promotes Permaculture in schools and colleges in Zimbabwe, and got letters from the coordinator, which asked the headmaster to cooperate with me in the research work. The other letter was addressed to the programme officer who is a former Permaculture facilitator in SCOPE and now works with another Zimbabwean NGO.

The workshop was attended by four farmers – all men; one AGRITEX officer – a man; four pupils – three girls, one boy; four teachers – two men, two women; and one district programme assistant officer from a local NGO. Therefore of these research participants, five were female and nine were male.

The report is organised chronologically in order to show how events unfolded during the workshop. The last part of the report discusses reflections on the workshop, some of which have a bearing on subsequent change laboratory workshops to be held in the two remaining case studies.

2. DAY ONE

2.1 Getting ready for the workshop

We (the researcher and his assistant) arrived at the venue of the workshop, St Margaret Primary School at about 11.15 for the workshop which was scheduled to start at 14.00. We met the Teacher in Charge (TIC) because the Deputy Headmaster, whom the researcher had met ten days previously to make arrangements for the workshop, was away. The school had just opened like most in the country – at a time when they were supposed to be in the middle of the term. The majority of teachers in the country had been not reporting for duty because of poor remuneration. With the TIC we discussed attendance and realised that two farmers and one external Permaculture facilitator who were meant to attend the workshop would not be able to because of other urgent matters. We agreed to have the two farmers replaced because without replacement, farmers would be under-represented in the workshop. The TIC then sent two pupils to notify the farmers who were to replace the others. But only one of the farmers was available and able to attend. We were later joined by the teacher in charge of Permaculture in the school who explained that they had identified pupils as requested. They selected pupils who lived in the school or nearby because they were unsure whether schools would be open by the time the workshop started. In addition they needed the consent of the pupils' parents, which would have been difficult to secure from most parents whose children were not attending lessons.

The TIC then allocated us a room in which to hold workshop – the staff room. We discussed the programme outline and asked for permission to take pictures during the workshop. We also asked the TIC to ask participants, on our behalf, for permission to take still and moving pictures and she agreed. We requested she do the welcome and introductions. After setting the stage we were offered guavas and some water to drink, which we accepted. The AGRITEX officer arrived at the school at about 12.15 to check if the workshop would be on. At about 14.30 all the participants were present except two farmers. We discussed the way forward and agreed with those present that the farmers should be picked up before the workshop began and this was done. The farmers explained that they had not turned up in time because they assumed that since their homes were on the way to the school, the visitors were going to pick them up. The return trip to fetch the farmers took nearly 30 minutes. Consequently the workshop started at 15.15.

2.2 Welcome and introductions

The TIC welcomed and introduced local participants. The researcher then introduced himself and his assistant. The first day of the workshop was attended by with three farmers – all men; one AGRITEX officer – man; four pupils – three girls, one boy; four teachers – two men, two women. Therefore of these research participants, there were five females and seven males. The farmer who joined on the second day was male, so was the external Permaculture facilitator, bringing the total number of males to nine.

2.3 Workshop objectives and programme

The researcher presented the workshop objectives and programme, which were briefly discussed. The objectives of the workshop were stated as:

- To trace the history of Permaculture at St Margaret School and its community;
- To develop the Permaculture activity system in the school and community;
- To share our different views of the issues that are faced in learning and practising Permaculture in the school and community;

- To analyse the issues and model solutions to some of them; and
- To consider and plan for continuous and joint improvement of Permaculture.

The programme outline focused on what each day was going to focus on, with Day One set aside for looking into the history of Permaculture in the school and community, sharing and using the concept of activity systems. Day Two was to be devoted to problem identification and prioritisation and learning about the expansive learning cycle. Day Three was to be set aside for selecting problems to work on and developing solutions to them while Day Four was to be devoted to sharing and strengthening solutions as well as planning the way forward.

2.4 Development of a Permaculture historical timelines

Participants were asked to break into two groups (farmers in one group, Permaculture facilitators in another) and develop a historical timeline of Permaculture from the perspectives of the farmers and that of Permaculture facilitators in the school. For each key event they had to give the dates and make some comments about the event in relation to the growth and development of Permaculture in the school and community. The AGRITEX officer worked with the farmers. Each group had two pupils. During the group discussions the research assistant and researcher's primary role was to observe. We observed the following:

- The farmers linked Permaculture to traditional agriculture but their starting date (1984) seemed to be more linked to when two of the farmers went into agriculture.
- Teachers had a record of some of the key events, which they consulted but had to add in more information to cover the comments section. There was a lot of debate in the group before an agreement was reached on what to record. The teacher in charge of Permaculture made the most contributions.
- Pupils in the groups did not make contributions and we did not intervene.
- The AGRITEX officer chaired the farmers' group while the youngest farmer recorded; in the farmers' group the female TIC chaired and the other female teacher took notes.
- In taking notes, the farmers' group first wrote them in an exercise book before putting them on the flip chart, while the teachers' group wrote straight onto the flip chart. Consequently farmers took longer to finish.
- The farmers' group explained their historical timeline to the pupils in their group at the end of the group discussion. The teachers did not.
- During the discussions the farmers' group was _serious_ while the teachers' group laughed a lot.
- The assistant researcher assisted the farmers' group in terms of level of detail necessary to answer the question.

2.5 Presentation and discussion of historical timelines (30 minutes)

The farmer group was invited to present first and the youngest farmer who took notes in the group made the following presentation which was video-recorded by the research assistant.

2.5.1 Farmers' historical timeline

DATE	Key events	COMMENTS
1984-1998	<ul style="list-style-type: none"> • Use of humus and other forms of fertility practices • Protection of water sources and wetlands (fenced) • Awareness 	<ul style="list-style-type: none"> • Bumper harvest • Volume of water increased • Reduced deforestation

	<ul style="list-style-type: none"> • Forests protection: Traditional leaders set bylaws on certain species such as <i>muhacha</i> (parinari), <i>mukute</i> (water berry) and other wild fruits, • Establishment of woodlots • Establishment of exotic trees • Introduction of biological pesticides and herbs 	<ul style="list-style-type: none"> • Fruits • No side effects
1998	<ul style="list-style-type: none"> • Introduction of Permaculture to School • Outreach to other schools and communities 	<ul style="list-style-type: none"> • School and the community work together • Seven schools in the cluster
2002	Social development, the coming of Environment Africa	12 Environment Africa Groups
2009	Competition between school and community in conservation farming	Better use of natural resources Improved food production

It was interesting to note that the historical timeline of farmers worked with a broader framework of sustainable agriculture and located Permaculture in what was already going on. The farmers' historical timeline did not have precise information on dates. The group focused more on events and less on comments, which were meant to explain the events. The presenter looked comfortable in making the presentation but had problems facing the audience. There was applause at the end of his presentation. No comments were made on the presentation.

2.5.2 Teachers'/Permaculture facilitators' historical timeline

One of the male teachers then presented the following historical timeline

Date	Key Development	Comments
1994	<ul style="list-style-type: none"> • St Margaret chosen as seed school • Started with a one garden zone (central zone) 	<ul style="list-style-type: none"> • Because of its facilities and the resources • A lot of erosion was taking place at the school
1995-1996	<ul style="list-style-type: none"> • Introduction of zones (zones 1-3) • Buying of gutters 	<ul style="list-style-type: none"> • The concept of start small and grow big brought about the development of other zones • To channel water at desired points
1997-1998	<ul style="list-style-type: none"> • A tank was donated by the Ministry of Agriculture (Mrs D. Norman) 	<ul style="list-style-type: none"> • PC had developed to greater heights hence the need for the tank.
1999	<ul style="list-style-type: none"> • Officially opened by the E.O. from Marondera 	<ul style="list-style-type: none"> • The school had excelled well.
2000 – 2001	<ul style="list-style-type: none"> • Introduction of nutrition garden • expansion of zones up to zone 6 • Acquiring of an engine (water) 	<ul style="list-style-type: none"> • To help orphan children at the school • To utilise the available land
2004 – 2005	<ul style="list-style-type: none"> • Cluster level piloting (by Deputy Provincial Education Director) 	<ul style="list-style-type: none"> • Develop partnership in different schools
2006 – 2007	<ul style="list-style-type: none"> • Receive visitors from SADC region 	<ul style="list-style-type: none"> • Come to acquire knowledge on PC (model school in Zimbabwe)
2008 – Date	<ul style="list-style-type: none"> • Slight decline in PC activities 	<ul style="list-style-type: none"> • Closure of schools • Electricity breakdown • Lack of motivation of teachers

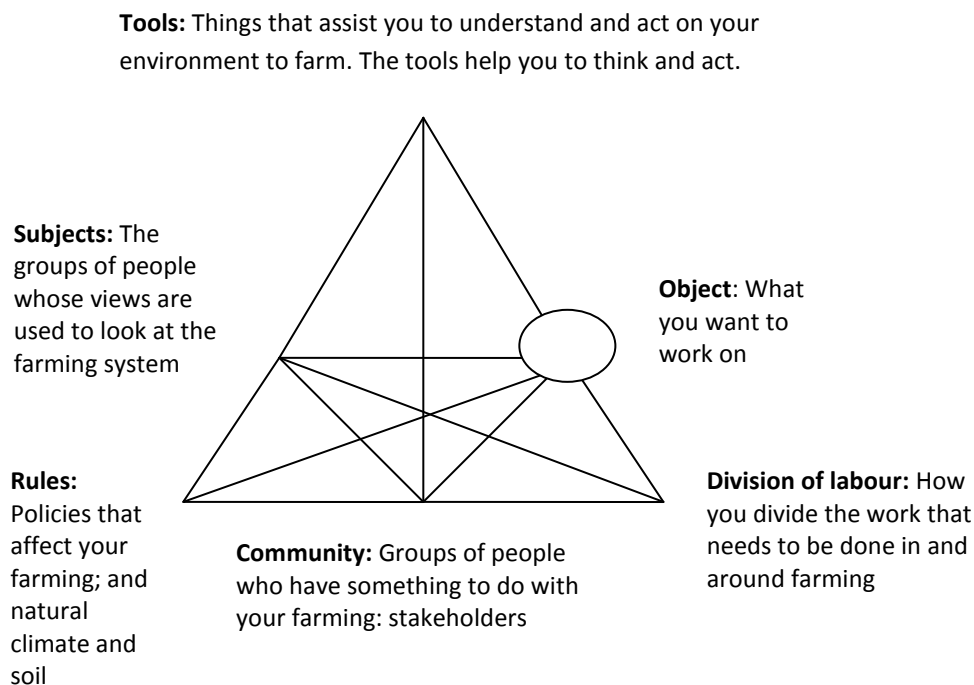
The presenter had little explaining to do and concentrated on reading out the timeline. He occasionally elaborated on certain points. There was applause at the end of his presentation. When the researcher invited comments, a member from the farmers' group noted that farmers

or the community was largely absent from the historical timeline and that, this should be changed. The teachers' group acknowledged the point.

2.6 Activity systems

2.6.1 Presentation of the concept of activity systems (15 minutes)

The researcher presented the concept of an activity system and pointed out that it was an important way to understand and approach learning by doing. Participants had problems understanding the notion of conceptual tools so the researcher/facilitator used a number of examples to illustrate the idea. The following diagram was presented:



2.6.2 Group work to develop a Permaculture activity system (35 minutes)

Participants were asked to go into their original groups and answer a set of questions which resulted in the development of an activity system for each major stakeholder group in the workshop. They were asked to answer the following questions:

Subject: From whose point of view(s) are you looking at the practice?

Object: Why do you learn, promote or practise Permaculture?

Tools: What are the main ideas and methods used in Permaculture?

How do you learn/teach Permaculture?

What are the main physical tools used in Permaculture?

Who do you learn with or from?

Rules: What the local or national regulations or laws affect Permaculture learning and practice? What environmental factors shape your practice of Permaculture?

Community: Who are your stakeholders?

Division of labour: What are the different roles played in the learning and practice of Permaculture?

During group work, participants in the farmers' group assumed the role of reading out questions on the flip chart. This was particularly useful for the 87-year old farmer who was very active in his group but who could not read from a distance. This time farmers went straight to recording their points on flipchart like the teachers' group. However, they had problems organising the information around the activity triangle. The subjects in the farmers group were limited to farmers while the teachers' group included pupils, parents and farmers. The AGRITEX officer maintained the original role in the group, so did the youngest farmer. The teachers' group maintained their original roles too but during the discussions on tools, the chair of the group who still had problems with the idea of conceptual tools temporarily retreated from her role. One of the male teachers seemed to fill in the gap. The teachers' group paid more attention to the inclusion of the community in their discussion of the activity system. The pupils in the teachers' group did not make any contributions (and seemed to be waiting for instructions). Teachers finished earlier than farmers by five minutes.

2.6.3 Presentation of the teachers' Permaculture activity systems (15 minutes)

Tools: Water conservation, soil preservation methods, care for the earth. Lecture methods, discussions, practicals. Hoes, manure, tins and sickles. Facilitators, teacher in charge of PC, community farmers.

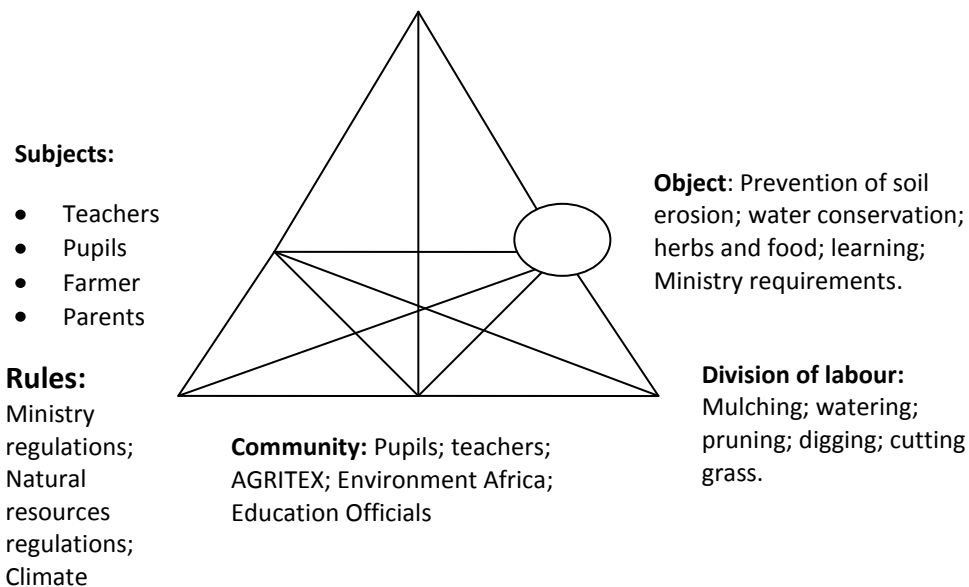


Figure 1: Teachers' activity system of St Margaret Permaculture

Another teacher presented from the group. While he was presenting a second teacher came to the front and deleted a point under rules but when the presenter come to the point, he wanted to go ahead reading out the point anyway. Participants applauded him at the end of the presentation. A criticism on the exclusion of environmental factors under rules was noted and climate was added. The main principles and concepts in Permaculture seemed to be missing

and one on care for the environment was added during the discussions. The researcher concluded that the phrasing of one of the question on tools to guide responses was part of the reason for this. Participants did not raise any questions.

2.6.4 Farmers Permaculture activity system

The farmers then made their presentation with the youngest farmer presenting again. He maintained his confidence in presenting but still did not face the audience most of the time. The only comment that was made by the other group was that the presentation was as good as that of teachers – could not differentiate between farmer and teacher.

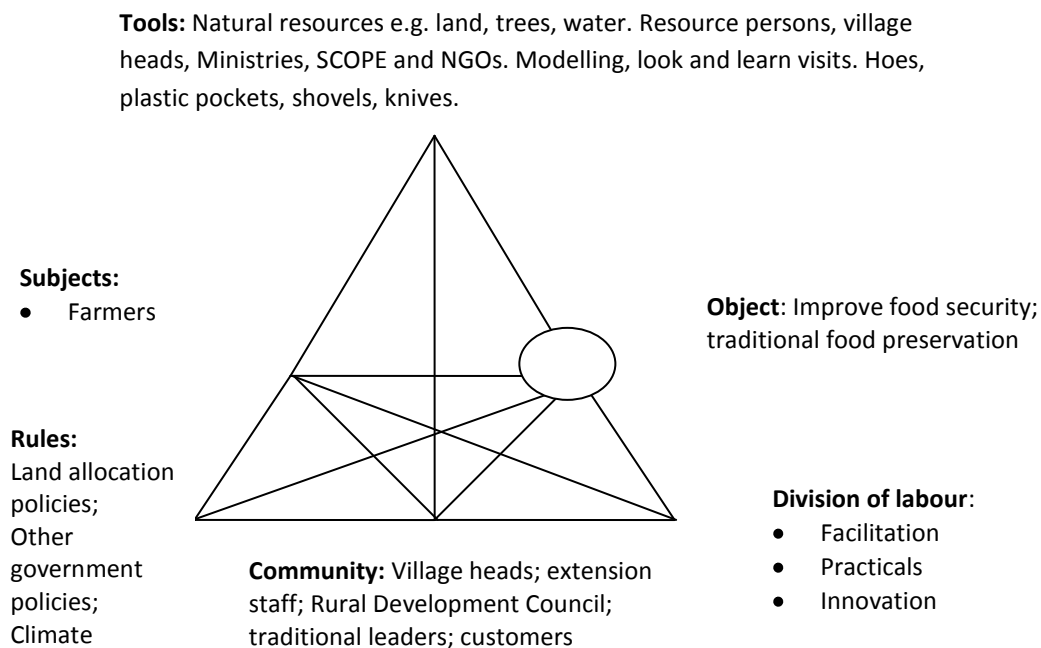


Figure 2: Farmers’ perspective of Permaculture activity system in community

2.7 Closing remarks

At the end of the day we discussed a suitable time to start the workshop on the subsequent days. We agreed to start at 14.00 because it allowed teachers to have an hour after finishing school at 13.00 and gave ample time for farmers to do their farming activities. I also indicated that participants were to be given cash instead of food and drinks and the total amount was to be determined by the numbers of days attended.

We dropped farmers at their respective homes as it was drizzling. We made an appointment with two farmers to visit their garden and take pictures the following day at 12.15. We (the researcher and assistant) met early the following morning for 90 minutes to reflect on the previous day and plan for the current day.

3. DAY TWO

3.1 Visit to the Bhake (and Mupfupi) brothers Permaculture garden

The assistant researcher and I arrived at the farmers' homestead on time and found one of the farmers present. The other farmers had gone to attend a Schools Development Committee meeting at another nearby school. We drove to the garden which is about a kilometre away and spent some 30 minutes touring the garden and took some pictures. Some of the interesting points that were noted during the tour were:

- The garden has been gradually expanded over the years to meet growing family needs, farming skills and knowledge.
- An invasive alien plant called *Lantana camara* was cleared during the expansion and it was burnt and the ash used for making fertilizer. Maize and beans are currently being grown at the site.
- In addition to expanding the gardening area, the Bhake family has also been diversifying crops as well as farming activities to include agro-forestry and beekeeping.
- The family practices both crop rotation and relay cropping.
- Crops in the garden were at different stages of growth, ranging from germinating to getting ready for harvesting.
- The Bhake family of five brothers collectively own the land and two of the brothers have been actively working on it without fragmenting it.
- The female spouses played a background role in relating with visitors.

After doing the garden tour we went to a nearby school and picked up the other farmer, whose meeting had nearly been concluded. He attributed his election to the school committee to his successful farming activities. On the way to the school, we met the AGRITEX officer on his way home from the fields. He indicated that he would be joining us latter.

We arrived at the school at about 13.50 and found that the pupils were not yet dismissed. We began the workshop at about 14.05.

3.2 Reflections on day 1

Comments were mostly made by the farmers. Some said they were pleased to learn more about the history of Permaculture in the school. The comments were positive and set a positive tone to the day. Pupils did not make a contribution.

3.3 Researcher's perspective on St Margaret Permaculture activity system

The researcher shared his perspective on the St Margaret Permaculture activity system based on interviews carried out in August 2008. The presentation was made on flip chart paper. Participants who took part in the data gathering agreed with the researcher's representation of what they contributed. During the presentation, one farmer participant and one external Permaculture facilitator arrived to join the group. The researcher acknowledged their presence and later invited them to introduce themselves. He then summarised what the workshop had covered to that point.

Mediating artefacts: Parents, fellow farmers, government and NGO extension workers. Copying and comparing; trial and error, learning workshops; handouts; look and learn visits; observation; follow-up visits; seeds and other planting materials; irrigation equipment; farm implements; water; manure; school, centre and home grounds, biological assessments; lectures; transect walks; demonstrations; group assignments; practical work; nurseries, gardens and field; natural environment, water tank; water pump. Gardens, fields and farmer markets; draught power; electricity; funds

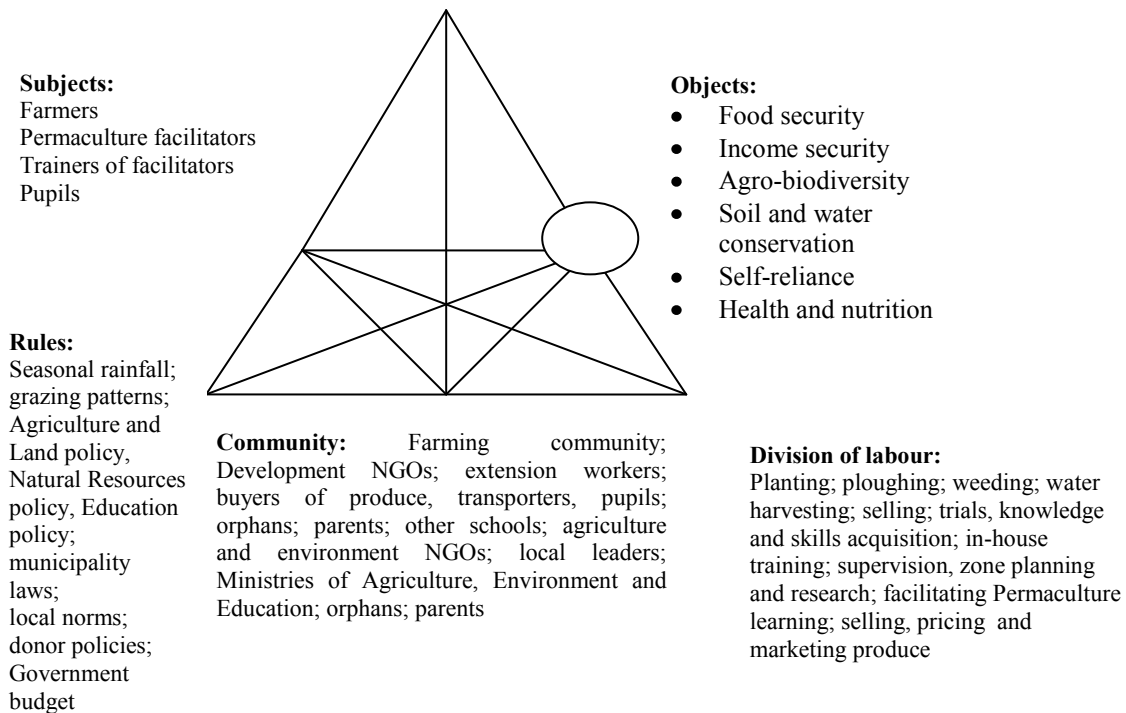


Figure 3: St Margaret Permaculture activity systems from the researcher's findings

3.4 Problem analysis and prioritisation in interest groups

Participants were broken into three groups of pupils, farmers and Permaculture facilitators and asked to answer the following questions:

Please identify problems or contradictions that you are facing in your Permaculture activity system. Score and rank the problems (three stones were given to each participant). Justify your scores. Choose the three or four most important problems and analyse them in terms of causes, effects, trends/history, size/scale. (Pupils only looked at causes and effects.)

The following observations were made during group work:

3.4.1 Pupils' group discussion

- Initially they discussed and recorded their ideas in Shona language before seeking help from the research assistant to translate.
- A girl served as secretary initially before handing over to the only boy in their group.
- The same girl put their ideas on flip chart paper because of her better handwriting.

- There was no obvious chair and each pupil wanted to have their point included on the flipchart.
- For the first time, pupils were active participants and it was useful to have them in a separate group so that their voices could also be heard.
- Each pupil scored easily but they had problems in ranking and the researcher assisted them.
- They debated extensively about who should present and seemed to have agreed on a strategy of sharing the presentation (but when the time came, the boy presented everything).

3.4.2 Farmers' group discussion

- The AGRITEX officer chaired their group discussions.
- The newly arrived farmer did not actively take part in the discussions.
- The two brothers were the most active participants.
- Each farmer had a chance to score the problems but they scored on different points on the questions – either at the beginning or at the end.

3.4.3 Teachers' group discussion

- The chair and secretary of the previous day retained their roles.
- The newly arrived Permaculture facilitator dominated the discussions.
- There was a tendency by some teachers to go on and on about a problem.
- At some point they debated extensively on whether a comment made was a cause or an effect (transfers).
- The scoring and ranking were done with relative ease but the stones were also put at either the beginning or the end of a problem.

3.5 Presentation of group discussions on problem analysis (30 minutes)

3.5.1 Pupils

The boy presented on behalf of the pupils and he basically read what they had put on flipchart. The participants were impressed by the product. However one of the teachers began marking their grammar and indicated that he was now speaking as their teacher. This was a clear manifestation of the vertical relationship between teacher and pupil. The presentation of the pupils was as follows:

Problem	Score	Rank
We have problems of manure	2	3
We have problems of seeds	3	2
Problems of water because our engines uses electricity	4	1
Problems of buyers	0	4
We have problems of garden tools (hoes, tins, sickles)	3	2
We have a problem of transport	0	4

Reasons	Effects
<ul style="list-style-type: none"> • Because we go to villages to fetch water • Because we have no seeds to grow • Because we have no hoes to dig, tins to watered and sickles to cut the grass • Because we have no transport to transported our crops • Because we collect manure from far areas • Because we have no buyers. 	<ul style="list-style-type: none"> • When we have no water, our crop died • When we have no seed our Permaculture died • When we have no manure our crops cannot grow well • When we have no buyers we run loss • When we have no transport, we have no money • When we have no tools we buy from our neighbours

3.5.2 Farmers

A different farmer presented and spent a lot of time elaborating on all the points. The outcome of their discussions was as follows:

a. Farmer identified and ranked problems

Problem	Score	Rank	Basis for scores
Courses and workshops are not regular	1	6	<ul style="list-style-type: none"> • Knowledge is very important • Lost species in herbal gardens • Losing interest (more but no pleasing income except domestic uses)
No written material on PC	3	1	
No specialised staff on PC within our reach	2	3	
Droughts hinder progress	3	1	
Seeds of some of tree species which we want	1	6	
Implements (e.g. watering cans, sprayers)	2	3	
Pests and diseases are a problem to control	1	6	
Theft	0	9	
Uncontrolled veld fires	0	9	
Water	0	9	
Marketing and transportation of PC products	2	3	
Trustworthy in groups	0	9	

b. Farmer analysis of three most significant problems

Problem	Cause	Effect	Trends/history	Size/Scale
Lack of specialised personnel in Permaculture	<ul style="list-style-type: none"> • Government not supporting (material and human resources) 	<ul style="list-style-type: none"> • Not enough information (awareness) 	<ul style="list-style-type: none"> • The current knowledge is from interested NGOs and other partners • No government support since the 1980s. 	4/5
Water	<ul style="list-style-type: none"> • Climate change 	<ul style="list-style-type: none"> • Pollution • Plant population • Reduced yields 	<ul style="list-style-type: none"> • Drought is increasing years over the last eight years in succession 	4/5
Marketing	<ul style="list-style-type: none"> • Market identification of PC produce • Poor road networks 	<ul style="list-style-type: none"> • Low income • Deterioration of perishables 	<ul style="list-style-type: none"> • Problem has increased since production started • Up to date produce not marketed outside the locality 	5/5

3.5.3 Teachers

a. Problems identified and ranked by teachers

Problem	Score	Rank	Basis for scores
Shortage of tools at school (hoes, sickles, cans, etc)	1	5	<ul style="list-style-type: none"> • No water, no farming • If there is no cooperation among staff members, the project fails • If the produce is not sold in time it will quickly go bad (perishables) • Parents, pupils opt to transfer from schools doing PC
Time factor	0	10	
Water	3	1	
Untimely electricity cuts	0	10	
Destruction by stray animals	0	10	
Theft	0	10	
Market problems	1	5	
Transport	2	3	
Social disturbances e.g. strikes	0	10	
Poor attendance during holidays	0	10	
Drought	0	10	
Staff turnover	0	10	
Poor cooperation from staff members	3	1	
Financial problems	1	5	
Poor cooperation from the community	0	10	
Management of funds from the Permaculture Project	1	5	
Associating PC with manual work	2	3	
Workshops	0	10	
Limited knowledge on PC	1	5	

b. Teacher analysis of three most significant problems

Problem	Causes	Effects	Trends/History	Size/Scale
Water	<ul style="list-style-type: none"> • Electricity cuts • Droughts • Seasonal rainfall 	<ul style="list-style-type: none"> • Poor yields • Loss 	<ul style="list-style-type: none"> • 1994-2000 school was not in control of diesel engine • 2000-2007, electric engine, school in control • 2008 to date (a) national strikes (b) destruction of electric wires 	<ul style="list-style-type: none"> • Poor distribution of water to the school • Yields improved (this period invited international visitors) • No yields at all
Poor cooperation from staff members	<ul style="list-style-type: none"> • No induction • No respect for PC leaders and admin. • No respect for teachers • General laziness • Resistance to change 	<ul style="list-style-type: none"> • Poor yields • Programme dies down • Poor relationships • Transfers 	<ul style="list-style-type: none"> • 1994-1996, PC was at its peak point (cooperation from admin) • 1997, new admin uncooperative (falling) • 1998-2002, very cooperative (picking) • 2002-2005, cooperative heads; • 2006-2008, uncooperative teachers 	<ul style="list-style-type: none"> • Very high yields, 1994-1996; • 1997, slightly shaking yields • 1998-2002, high yields • High yields • Slightly shaking yields
Transport	<ul style="list-style-type: none"> • Poor roads • Fuel prices • Lucrative businesses poor 	<ul style="list-style-type: none"> • Perishables decay • Buy expensive things • No local markets • Expensive transport • Selling produce at a loss 	<ul style="list-style-type: none"> • 1994-2001 transport was good • 2002-2004, service was declining • 2005 to date, serious transport problems 	<ul style="list-style-type: none"> • Efficient • Slightly efficient • Inefficient

3.6 Concluding remarks

The discussions on the presentations were brief and took about five minutes only. The researcher thanked participants for the work and suggested that they end the day at this point because the group discussions had taken longer than planned (understandably so). The expansive learning cycle was shifted for presentation the following day. Farmers who live on the way from the school (to Harare) were picked up and dropped by the researcher. They were also asked to write about the history of their farming activity so as to provide a more concrete example of how they have integrated Permaculture into their activities. One of the farmers agreed to do a write-up. We also made an appointment for taking a video of the family farmers' garden the following day before the workshop started. This was to be followed by another one at the school, which the PC teacher in charge agreed to guide.

3.7 Researcher and assistant reflections

We took about an hour discussing the events of the day and planning for the next day. The main change that we made in the programme was to include the expansive learning cycle and to provide more time for group work on modelling solutions based on the experience of the previous day. This was because we had not been able to cover it on the day as planned because the discussions took about 45 minutes longer than planned. We also agreed that there would need to be two groups on solution development and that these should be mixed in order to tap into distributed knowledge.

4. DAY 3

4.1 Video taking

We arrived at the homestead of the family farmers at about noon and waited for them to finish what they were doing before driving to the garden. The farmers agreed that one of them was to guide us. We spent about an hour in the garden and took a 30-minute video. During the tour it became evident that the use of the video camera was having a negative effect on the content of the farmers' presentation. We selected only some aspects of the garden which either the farmers or the researcher felt were important to highlight. From his explanation, it was clear that the garden had not only been expanded physically but also in time, through planting and harvesting three times on each piece of land as opposed to once. I bought some plants from their nursery to for personal use as well as to encourage the farmers. From the explanations during the tour, it was clear that the farmers were professional and commercially oriented and also played a social role by helping others learn for no fee. They even harvested some bananas which they later shared with workshop participants. We were given some citrus fruit to eat during the tour. One strategy that they have employed to discourage theft of their produce is to teach other farmers to produce more effectively and it appears to work. They also give them planting materials.

4.2 Reflections and presentation of problems by the researcher

Participants had no reflections to share on the previous two days. The researcher therefore proceeded to share the problems that he had identified during his interaction with research participants in the case study. He identified and presented the following problems:

- a. Time: time to learn Permaculture; time to build the soil and water conservation capacity, pest-predator balances and biodiversity;
- b. Tools and equipment: more are needed to lessen labour;
- c. Resources: to fund workshops, tours and other forms of learning strategies;
- d. Limited availability of appropriate learning materials for farmers;
- e. Lack of accreditation of Permaculture courses discourages youths from learning it;
- f. Contradicting messages from promoters of conventional, and those of sustainable agriculture;
- g. Inadequate mechanisms for the continuous, joint learning of farmers;
- h. Inadequate government support especially in terms of human and material resources;
- i. Poverty and HIV/AIDS;
- j. Climate change and poor soils; and

- k. The need to balance the ecological, economic and social interests (which scored 98 %; 67 % and 74 % respectively) in Permaculture.

A brief discussion of the problem identified showed that participants agreed with the findings but noted a gap in terms of *marketing and transport*.

4.3 Presentation and discussion of the expansive learning cycle

I presented the expansive learning cycle and explained that it can be used for learning to understand the object better and for improving practices or activity systems. Participants wanted to know what was special and different about this way of solving problems. I explained that problem solving only started after one had done a good analysis and therefore had a good contextual understanding of the problem. And that when a solution was designed it had to take into account the different dimensions such as causes, effects and trends and that when a solution was developed, it had to be examined before implementation. Review was also essential after implementation. One participant wanted to know whether it was essential to have the seventh stage of consolidation or final model, if the sixth stage proved that the new model was okay and needed no changes, to which I responded in the positive.

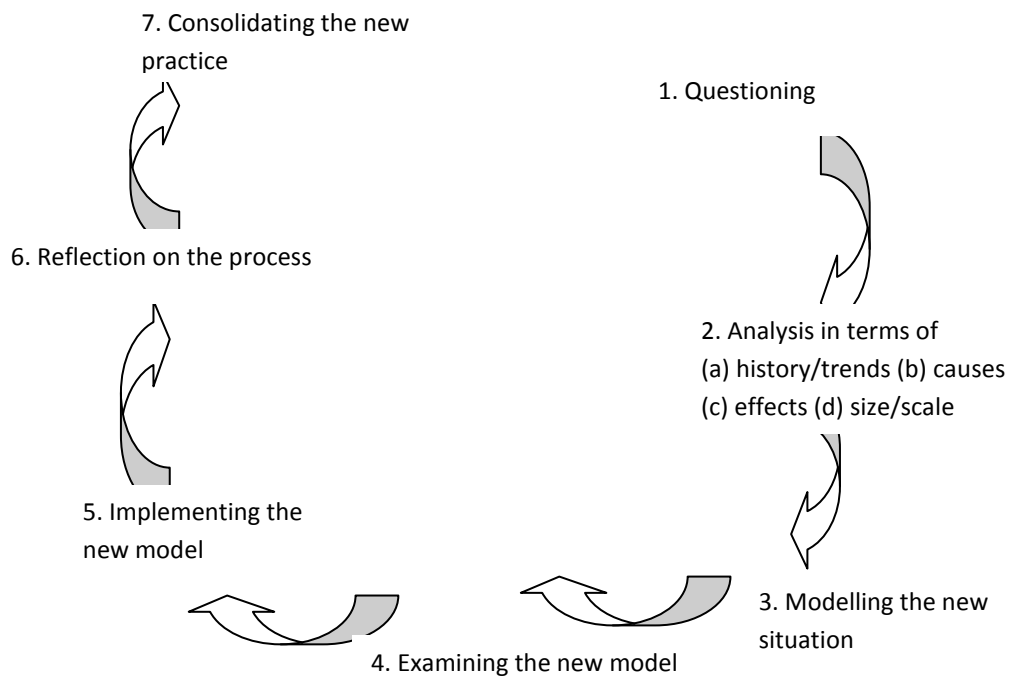
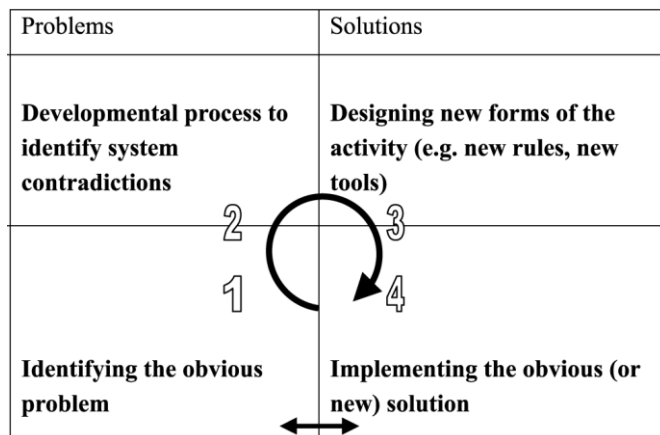


Figure 5: Sequence of epistemic actions in the expansive learning cycle.

The explanation about the rigour in expansive learning (first four stages) was better understood, when I shared with participants the figure below. The main point was that before a solution is reached, a number of steps should be followed. However, based on my understanding of the process, I changed the model slightly so that stage 4 was developing a model solution after examining it in stage 3. The implementation stage remained 5 as in the

expansive learning. At the same time, I also believe that even those people who implement solutions design them in their minds first before implementing them.



Source: Seppänen (2002); Botha et al. (2002) in Hill, 2007, p. 264

4.4 Designing solutions to identified problems in groups

The facilitator asked participants to identify four most important problems to which they could model solutions. Participants decided to work on the following:

- a. Water shortage
- b. Lack of cooperation among staff
- c. Market and transport problems (combined)
- d. Lack of qualified personnel to teach Permaculture

Two groups were formed in such a way as to balance gender and stakeholder representation, as well as to benefit most from distributed knowledge. Group B was assigned problems (a) and (d), and Group A was assigned the remaining two. During group work, pupils were actively involved, and often asked to contribute. This seemed to suggest that their peripheral participation was being transformed as they began to understand some of the things that were going on. But what was clear was that in both groups the vertical relations between adults and pupils remained because in one sense they were pupils and in another, children – sons or daughters. During the discussions, Group B found it difficult to tackle ‘Lack of qualified personnel to teach Permaculture’ because it was an issue not in their immediate sphere of influence. The facilitator intervened and encouraged them to choose another important problem. The group decided to work on ‘We have no garden tools’, one of the two most important problems from the pupils’ perspective. The selection of this problem, which had not been analysed in previous sessions (unlike the four listed above) meant that the group needed to work on problem analysis before designing a solution. Consequently Group B took longer to complete than the other group.

The one hour and 20 minutes assigned for the task seemed to encourage deeper participation and members of groups were actively engaged in discussions. The lady teacher who played the secretary role in the teacher group retained that role in the mixed group. The external Permaculture facilitator who joined the group on the second day chaired in this group (B). In

Group A, the AGRITEX officer retained his chairing role and one of the male teachers took notes for the group. The discussions were mostly held in Shona in both groups.

Towards the end of group discussions, at about 15.45, three women arrived and knocked at the door to the room that we were using for the workshop. They were women farmers who wanted to join us, but we had only one ‘day’ left. The teacher in charge of Permaculture who had invited them a week earlier answered the door, consulted his group before checking with me as the facilitator on whether to allow the women to join. We all felt the same way: it was too late for them to join and learn much or contribute meaningfully. They were advised accordingly and they left, as the assistant researcher later commented, “They were going to be passengers in the process”. And the numbers of participants or pictures of participants in the workshop would have conveyed a rather misleading idea of participants and participation. It would have been interesting to establish why it was the women came so late to the workshop.

4.5 Homework

The task was:

Write a letter to the responsible authority outlining the problem that you are facing, its causes, effects and trends. Conclude the letter by making concrete and specific recommendations as agreed by the group. As far as possible, indicate who should do what, when. Be as realistic as possible

In Group B, the Grade 7 pupil was asked to also write a letter. Noting this, the facilitator encouraged Group A to give their Grade 7 pupil a similar assignment. Interestingly, in each group one teacher and one farmer were selected to write the letter on behalf of the group.

5. DAY 4

The researcher and assistant research reflected on the previous day and planned for the current, spending about one hour and 15 minutes on the task. At about 12.40, we picked up the farmers on our way to the school. On arrival at the school at about 13.00, we found that the pupils had not yet been dismissed. We had planned to shoot a video of the school at about that time. It was not until 13.35 that the school was ready for the event. The research assistant took the video and the teacher in charge of Permaculture guided the tour. Meanwhile, I was involved in the payment of money for participants to buy food. From the beginning, we had agreed that instead of buying and bringing food, participants would receive cash. This was good because it gave them choices. But more importantly for us, it saved time.

5.1 Reflections

Participants said they found the exercise of designing problems and the stages in expansive learning very useful. They noted that this could be employed not just in agriculture but in other spheres of life. The participants who had been assigned the roles of writing letters indicated that they had done their homework.

5.2 Group discussions to critique letters compiled by group members

Each group went through the process of listening to the letters being read out and making comments. Most of the comments directed at the pupils were about improving the grammar. In Group B, members did not like the use of the singular in one of the two letters compiled by

adults. They felt that it did not show collective ownership of the product, and would not be treated seriously by the responsible authorities if it was seen as an individual recommending. That was adjusted accordingly.

5.3 Plenary presentation of letters of solutions (50 minutes)

Groups presented in turns before questions were made which would cover one of the three presentations. In each group, the facilitator asked the pupils to present first. In Group A, the teacher wanted to present for the people. In group B, a teacher presented the letter he wrote as well as that compiled by a farmer.

Group B: Letter 1

RE: Requesting tools for Permaculture

Dear Sir/Headmaster

I hereby write this letter to you requesting for PC tools for the meantime we do not have anything to use, since parents are now refusing with their tools due to failure of the students to return them back home. I as the head girl hereby request the following tools: sickles, water cans, hoes, garden forks spades, slashes and seeds.

We have a problem of water due to the electrical breakdown. We therefore ask for your help since the programme is not functional.

Yours faithfully

Moreblessing (Pupil)

Group B: Letter 2

RE: Water problem at St Margaret Primary School.

Dear Sir/Madam

This letter serves to enlighten you about the level of water problem at this institution. We will include the problems, cause, effects and trends in this write-up. At the end I will try to make recommendations for this problem.

The real water problem came when there was an electric breakdown along the line which leads to our school. The cause of this problem was human since some people tempered with the wires. As you know that our pump is electric powered, the pump stopped working at that particular day at the end of 2008. In a school situation it is impossible to operate without water. Vandalism of electric cables is a result of ignorance on the part of the community. The school is now suffering because of this community ignorance. The school as you know only relies on one source of water. There is no other alternative to get water from. It is not only the school children who are being affected but even the teachers and community.

Such as serious water shortage has a detrimental effect to the school. Cholera is likely to affect the school children as well as the teachers. The PC projects for which the school was famous is going to die. Remember teachers will be motivated to work where there are enough

resources. Hence with this shortage of water, your school might end up with less qualified personnel.

After all PC activities were generating income for the school. Because of this situation, the school is not longer benefiting from the project.

As from October 2008, the activities at the school are getting less and less and appearance of your school is deteriorating because of this acute shortage of water.

As a means of trying to alleviate this problem, we have decided to write this list of recommendation for you to consider:

RECOMMENDATIONS

We thought you could start by educating the community about the importance of water and its sources. The community should also respect electric wires as they provide a service to the community. Another important recommendation is that you should provide alternative ways of providing water for the school such as drilling boreholes, use of windmills which uses wind instead of electricity. If funds permit, you should think of buying a diesel engine or a solar powered engine. Generators also can substitute electricity problem.

If you and your committee still insist on ZESA power, you should try to form a committee, which should have to communicate with ZESA to find out what stops them from coming to make the repairs. Once the committee gets communication from ZESA, it will sit down with the local community to arrange for what the ZESA people want. If it is possible for ZESA, then the community will have to do it.

Yours faithfully

Group B.

Group B: Letter 3

Request for attention to the problem of tools

Dear Sir

I kindly ask for your attention to consider the problem of tools for PC at our school. In the first place, some of the tools were there at the school but due to the following causes they are no more.

The poor management of project tools, negligence and transfers of the staff in charge of PC contributed much to the shortage of tools. There was no one directly responsible for the stocks of those tools hence no one dared to look upon them. As a result, the project proved unproductive and fetched no funds at all. Another aspect of lack of knowledge of the community (parents) concerning the importance of the practice, ended up in the pupils' failure to bring work tools to the schools. The above mentioned causes brought about a standstill to the project. The project became unfruitful and nearly abandoned.

I call upon you as the organising body of the school to exercise your kind consideration in setting up a responsible committee for the issue. The committee should include the following:

- Specialised personnel in PC;

- Member of the community;
- Pupils; and well as one of the committee members.

The specialised personnel (PC) "s duty is to give knowledge to the community first and then to the pupils and other staff. The community rep should witness the record keeping of tools at the school. The SDC member manages the keeping of tools. The committee should arrange fundraising activities to raise money to re-stock the tools. Once we have the tools in stock, then the committee will take care of the tools and they will take care of the tools and they will stay for long.

Yours sincerely

Group B.

Group A: Letter 1

RE: ...

With my friends, we discussed some Permaculture problems. The major problem we are facing is poor coordination of teachers.

Causes for poor cooperation of teachers are as follows: some teachers who come to the school have no knowledge of Permaculture; general laziness and resistance to change.

In our discussions we came up with model solutions. New members should be taught Permaculture. The new teachers should also do tours of Permaculture by visiting other schools where it is being done in the area. Also teachers must be motivated.

Please help us to implement this solution so as to get better Permaculture produce.

Yours faithfully

Kudakwashe Museba (Grade 7 Pupil and member of PC Club)

Group A: Letter 2

I write to let you know the above project which is in your ward has some problems which need your attention urgently.

The problem has reached a high level of production of Permaculture produce. According to the group"s short and long-term goals, it has come to its long term goal that is, selling producing for income. The group has made a baseline survey for its business and come up with two major problems which are marketing and transport network.

Marketing: *The produce is of high quality and toxic free because we discourage the use of artificial chemicals both for spraying and soil enrichment therefore we hope to get the assistance through your mediation. At the same time, most of the perishables are decaying and being sold at a loss.*

Road network: *Since our road is not regularly serviced, the few motorists who use it are charging unmanageable fares of which we end up working for them and not for our reward. So if this situation remains, there is going to be a decline in the group"s production and general development in your ward.*

Hence we are requesting you to forward our plea for assistance as you sit for council meetings. As a group, we have agreed ourselves to fill in some of the bad patches in the roads which have been caused by erosion. This is a temporary solution. We ask you to put a proposal for a tarred road in your agenda. Once our proposal meets a positive response, we believe there will be great change in the group, community and the ward at large.

Yours sincerely

M. Mupfupi (Group Secretary)

Group A: Letter 2

RE: Problems, causes, effects and trends of poor cooperation by the staff regarding Permaculture

The above refers. I write this letter to you with reference to the above. As Permaculture facilitators, we are facing mammoth problems from our colleagues during Permaculture activities. The main problem we are having is poor cooperation from some of the staff. There are divisions among the staff. Some of the members are not even moved when it comes to Permaculture activities. Some of the causes of these problems are as follows: there is no proper induction given to new staff members; no respect for Permaculture leaders and administrators; no respect for teachers; general laziness and above all a total resistance to change.

Due to the nature and depth of these problems, there have also been some negative effects. Of late there have been poor yields and the programme is dying. Here are also some poor relationships created. Another serious problem sir, which is not only affecting Permaculture but the society at large, is that of transfers. The school is losing experienced teachers. This dates back to the 1990s. Since the introduction of Permaculture in 1994 up to 1996, everything was rosy. During that time Permaculture was at its peak. There was an administration which was very cooperative. In 1997 the administration was uncooperative and hence a reduction in Permaculture activities. Permaculture was also widely boosted between 1998 and 2002 because of the cooperative staff and administrators. This was quite an encouraging period. Permaculture has also been at its lowest point from 2006 to date due to uncooperative teachers. A total revamp is needed so as to rebuild it.

We have recommendations to mane so as to put a new face on the ailing standards of Permaculture at our school. There must be proper and stimulating induction exercises given to new member of staff. We also need educative Permaculture workshops at least once every term. Teachers and administrators who give each other a cold shoulder must undergo counselling. Some educational tours must also be organised. There must also be some staff development programmes at our school. Members involved in the Permaculture activities must also have some incentives from Permaculture sales. There must also be prizes given to hard workers. Permaculture leaders must also have good public relations.

So we finally conclude that for Permaculture to be successful at our school, all the stakeholders must work hand in glove. May God bless you.

Yours faithfully

Fungai Chirashanye (Permaculture facilitators)

5.4 Plenary comments on presented letters of solutions

During presentations one of the pupils struggled to read some words in his letter. Most comments were also directed at pupils and the group whose pupil was being criticised defended/explained. The facilitator raised the issue of using ‘-F’ and ‘-me’ in the letter from Group B and after some discussion it was agreed that it would be best to write the letter in the plural. There was a general agreement that some of the letters needed further work in order to be more convincing. The letter on marketing and transport problems was specifically targeted for further improvement because it did not address many of the causes and effects. It was worth noting the differences in perspectives between the pupils’ letter on tools and that of adults. The facilitator made it clear that the comments were directed at the whole group that worked on the problems not only at the person who had compiled the letter based on group discussions.

One of the two family farmers who had agreed to write a historical story of his farming handed over the story to us. This was, however, not shared with the rest of the participants partly because of time, and also because it would have disturbed the flow of the discussions. The story, will however be shared with them through a workshop report.

Box 1: The history of Permaculture at my home – farmer Bhake

It started with my father in the 1970s for he was a farmer – a peasant farmer in fact. Since he was just interested in farming, it took him just a few years to live on farming as his source of income. I would like to point out that this farming I mentioned above was horticulture.

If you allow me to define it further that was pure organic farming which one would also define as Permaculture. To be honest, my father did not know that he was practising Permaculture. In all these years he never used chemicals in his farming. If he did, it was an experiment.

Materials used to conserve soil and water:

He used cattle manure since he owned a large number herd of cattle. Goat manure and chicken manure was the common thing at one’s home those days, hence sustainability was easy. He also used humus from the mountain (mutsakwani) and compost, both pit and heap to maintain soil fertility.

Water was conserved through water harvesting trenches, contours, wells and observing traditional beliefs at spring waters, e.g. not using pots at water sources. Plantations of sugar cane and bananas were also used along or around water sources like rivers and springs to conserve water.

Methods used in cultivation:

He used draught power and a tiresome bucket-carrying method of watering. In some cases, trench flooding would ease the burden of watering.

Production/yield:

It is very surprising but true to point out that in those years there were no serious plant diseases or pests. If they were there, then maybe the theory that „the healthier the soil, the healthier the plant, and the best yields“ can apply. The yields were very pleasing and encouraging but the market was very poor. The value of produce was underestimated resulting in low incomes.

NEW ERA 1980-2009

My father passed away in 1980 resulting in us (sons) inheriting the land [note here the gender dimension on access to land – mother not mentioned and sisters not inheriting]. One would wonder what new era means but it is only a matter of young blood taking over with modernised ideas of farming [culturally more advanced activity system].

Farming systems

There was no difference in the use of soil builders (manures) but the knowledge of doing it was modern. We would intercrop and rotate different crops on the same piece of land about three times a year. The advanced technology of farming we had embarked on saw us producing bumper harvests. As a result, we managed to buy a five-horse power water pump and pipes; hence the watering system was improved. We also established nurseries and herbal gardens. At times plant diseases became rife and

so we resorted to chemicals but just to a very low percentage (25 %). Another thing we introduced at the farm land is agro-forestry, water harvesting techniques and beekeeping.

Area of most significant change

As the proverb goes, „like father like son“, the land had proved to use a genuine source of income. All of us (brothers) managed to buy beasts, goats, domestic utensils, even paying lobola for our wives. If I go on to mention other small things like fowls, it would sound pompous.

It is a marvel that during the drought years, we never ran out of food, instead we even provided some to the community. Most of the people in the community have also learnt from us, hence they are also sustaining themselves from the land. Through farming outreach programmes, we have received different NGOs and we have benefited from some of them e.g. Environment Africa which helped us establish an agro-processing centre for processing agro-products for sale. At one time we won the Zimplow National Award: two ox-drawn ploughs, one cultivator and four hoes. Another time we won the Environmental Award of 2005 from Environment Africa.

In the end I would like to say all this farming business has marketed our works, particularly our name far across the country and even abroad.

Thank you Bhake (for the Rusike brothers)

5.5 The way forward

Participants were asked to discuss what they intended to do with the problems they had identified and solutions they had proposed. After considerable discussions, participants decided to do the following:

Activity	By whom	When
1. Select a committee to spearhead the finalisation and implementation of solutions	Workshop participants	05/03/2009 <i>(This was done during the workshop)</i>
2. Make further improvements to the letters (examining solutions)	Committee	10/03/2009
3. Identify and recruit other people, including the influential, to join the group (of solution seekers)	Committee	To be decided on
4. Identify and meet appropriate decision makers with clear recommendations to selected problem	Group and committee	To be decided on

5.6 Handing over the stick

The participants facilitated the selection of member to the committee on their own. For me this was an important symbolic moment for handing over the facilitation of the learning and developmental process. What was interesting to note before the handover was the idea of including other members in the group. This was intended to increase the group’s **collective agency** by bringing in more knowledge and skills, which could have been inspired by our earlier discussion on **distributed knowledge**. However, the search for influential people to join them brought in another dimension outside general knowledge and skills. The participants wanted people with power and influence, with **relational agency**, people who knew who to talk to and who were likely to be listened to; people who had connections. While participants were selecting the committee members and assigning dates to activities, the researcher and assistant were taking notes from flipcharts used during the day that they had not typed already. We did this because we planned to leave all the materials generated during the workshop, with the participants so that they could use it during subsequent processes. This was also ethical and in keeping with not doing extractive research. This was

another form of *handing over* – *the products of what we had learnt in addition to the handing over of the process*. Participants seemed to be surprised and impressed by the gesture. Most had taken notes anyway.

5.7 Workshop evaluation

Twelve (12) of the participants responded and it appears as though one pupil and one farmer did not respond. The facilitator allowed them to respond in the language of their choice. Of these, 3 answered in the local language and 1 answered in both. This probably suggested which participants preferred which language to have been used during the workshop. Participants were asked to evaluate the workshop by answering the following questions:

1. What did you find most useful about the workshop?
2. How do you plan to use what you learnt from the workshop?
3. What did you find not useful?
4. How could the workshop have been better?
5. Any other comments.

Participant 1 (English)

1. *The most important thing that I find useful about the workshop is the best way of addressing a problem.*
2. *I intend to write letters to persons concerned.*
3. *None.*
4. *The time covered should have been longer.*
5. *The workshop is one of the best on how problems should be solved.*

Participant 2 (English)

1. *I have found the expansive learning cycle to be very useful and plan to use it whenever there are problems.*
2. *My plan is to be part of the group which works towards the improvement of such problems which affect local schools and communities.*
3. *Almost every aspect was quite useful to me.*
4. *Use of both Shona and English in the workshop would have helped in a mixed group of people like this one. Some farmers and pupils are not well versed with the English language.*
5. *The workshop was quite educative and functional. It is something which is going to be used for the better of the community.*

Participant 3 (Shona)

1. *The staff in the school must show cooperation so that Permaculture can be improved.*
2. *I want to plan how I can get a place where I can do Permaculture.*
3. *I think all that was covered was useful.*
4. *We could have allowed more people to come to the workshop.*
5. *I think the workshop taught us more than what we think.*

Participant 4 (Shona)

1. *I was very pleased to discuss the matters we looked into which covered electricity and tools to use in Permaculture.*
2. *I am thinking that if it was possible we should start to engage the ZESA people so that electricity is back in the school.*
3. *I found everything covered during the workshop useful, nothing was useless.*
4. *The workshop should have taken longer or take place again in the near future.*
5. *We are very grateful for your coming, which we did not expect.*

Participant 5 (English)

1. *The workshop was really useful as it came at the right time. We discussed relevant information and problems affecting us at present.*
2. *We are going to sit down as a school and find a way forward to write and inform stakeholders about the importance of such developments and how to go about dealing with problems affecting us and the community.*
3. *There was really nothing not useful or unusual about the workshop. All information was relevant and useful.*
4. *The workshop could have been better if we had chosen a member to keep time.*
5. *There was need for a break for a drink to soften the throat as there was a lot of talking.*

Participant 6 (English)

1. *The problems encountered in the community and how to solve them, learning does not end.*
2. *Teach others what I have learnt. Approach influential members to discuss different problems.*
3. *Nothing was not useful. All was useful and educating.*
4. *Invite more people of different departments.*
5. *Have more workshops on Permaculture.*

Participant 7 (English and Shona – 3:2)

1. *All was useful*
2. *I would like to teach other people/persons.*
3. *Nothing.*
4. *To do more.*
5. *Workshop was successful, it taught us well.*

Participant 8 (English)

1. *I have learnt more on steps to follow before you find solutions to any problems.*
2. *I am going to use this knowledge when training extension workers on programme plans for their areas on Permaculture projects and others.*
3. *Increase the duration of the workshop by increasing it from 4 to 5 days.*
4. *Nothing was not useful.*
5. *This has been a good learning situation as well as planning workshop for the school Permaculture project. It would be good to get a handout on the expansive learning cycle.*

Participant 9 (English)

- 1. The workshop was of great help because it addressed the problems we are facing right now.*
- 2. I will use the knowledge from the workshop on improving the practising of Permaculture at our school.*
- 3. Everything was useful.*
- 4. More members should have been invited to the workshop.*
- 5. The workshop was of great importance. The workshops should be held each year.*

Participant 10 (English)

- 1. The mode of presentation and material used has a punch for both personal contentment and improving what is already grown.*
- 2. I am going to put what I have learnt into practice where I am going to draft a project cycle.*
- 3. The workshop had nothing bad.*
- 4. Videos from other areas, local and abroad about Permaculture. Conduct visits to participants' residents. Handouts containing related information.*
- 5. The workshop was well designed especially on identifying regarding the centre and sectors. After some time of doing Permaculture, there must be given certificates of participation.*

Participant 11 (Shona)

- 1. What was important about the workshop was learning about problems in Permaculture.*
- 2. I will tell others what I have learnt during the workshop.*
- 3. Everything was useful.*
- 4. Nothing needed to have been done better or differently.*
- 5. We would like to have another workshop of this nature held because it was interesting.*

Participant 12 (English)

- 1. The knowledge that was given to us was quite useful.*
- 2. The ideas that were given of including influential people from the community to form Permaculture Groups.*
- 3. Inclusion of pupils was not so useful. They were a bit too passive.*
- 4. The starting time was supposed to be much earlier, and also there was need to invite more adult people to the workshop for a wide range of knowledge.*
- 5. The workshop was supposed to cover many days. Incentives for participants should have been higher, at least US\$30.*

5.8 Closing remarks

The facilitator thanked all participants for their time and contributions during the workshop. He indicated interest in knowing what would become of issues raised during the workshop and told participants that he would return after midyear to debrief them on what was emerging from the research. He then handed over to the TIC who thanked all for the

contributions and for foregoing other forms of work to attend the workshop. She highlighted the value of the workshop, especially the value of expansive learning. She promised on behalf of the group that they would take on the challenges that they raised. Three other participants spoke after her, underlining their commitment to future action and the potential value they had found in the model of learning and development that was shared and used during the workshop.

5.9 Overall reflections

1. Working with a research assistant paid off and I would need to work with one in future such workshops because:
 - a. He served as a useful ‘bouncing board’ for reviewing and re-planning the workshops;
 - b. We shared the role of observing participants during group discussions and took notes of important points;
 - c. During the plenary session when I was facilitating, he was taking videos of some of the proceedings; and
 - d. He also assisted the groups by addressing questions of clarity.
2. I was able to follow the design of the Change Laboratory workshop: the general layout of the sitting arrangement, which was broken during group discussions; the separation of models; problems and mirror data; and solutions. However, we did not put the solutions up on the board between the two forms of stimuli because of space problems. Instead we had participants write letters and read them out. I saw this as an innovation rather than as a deviation because letters to responsible authorities seemed to make the recommendations more real.
3. The amount of time allocated for the workshops need to be reviewed upwards in view of the following observations:
 - a. Three participants indicated that more time was needed for the workshop;
 - b. While each participant underlined the value of the expansive learning cycle, none of them made reference to the activity system or its value, suggesting that it may not have been well understood and its relationship with expansive learning not made explicit enough.
 - c. The planned time for the workshop was eight hours over four days but we ended up using about 10 hours over the same period.
4. I should make more explicit the relationship between activity system and the expansive learning cycle in future because of 3 (b) above. I could achieve this by putting a triangle (representing activity system) at the beginning and another at the end of the expansive learning cycle. The one at the end would represent a more advanced activity system once model solutions have been successfully implemented and adopted – other things being equal.
5. It might be necessary to look for more suitable words to replace ‘tool’ and ‘rules’ because the words are not ordinarily used that way among participants.

- a. For tools, one could use: concepts and tools; guidelines and tools; principles and tools; truths, tools and tutors; key concepts, learning resources and tools;
 - b. For rules, one could use: environmental, economic and social provisions/conditions or enablers and constraints.
 - c. A third possibility is to ask participants what they think would be the best words to replace 'rules' and 'tools' after providing the explanations.
6. Participants should be allowed to choose the language in which to discuss **and present** their exercises in order to get the most out of the process from both the perspective of the researcher and the participants. This is based on the following observations:
- a. Most group discussions were held in the vernacular;
 - b. One participant raised his concern about the ability of the pupils and some of the farmers to communicate their ideas effectively in the English (and this could apply to some farmers in subsequent workshops);
 - c. When I asked participants to write their evaluations in the language of their choice, three of 12 participants (25 %) wrote in Shona and one answered some in English and others in Shona, the vernacular language. Use of more than one language in the plenary will require an interpreter and this will mean more time and prior arrangements.

2.7 TRANSCRIPT OF THE ST MARGARET SCHOOL (SCOPE) FEEDBACK WORKSHOP 09/09/09

Part 1

Presentation and discussion on how the electricity and water problem was addressed (the tension between the need for agricultural production in the school and the lack of tools to produce).

501 So basically it is about 10.00. I think we can do it in three hours. The idea is to get your feedback with regards to the committee that you set up with some of the solutions that you modelled in terms of how far you have gone with and reviewing them or implementing them and then how far the committee has gone. Then I will give you feedback in terms of what I have found out so far as far as the research is concerned, what seem to be the main patterns or themes emerging from the research. Then the other very important part is for me to thank you for taking part in this research process as this will be my last contact session with you. So I will be saying 'goodbye'. So these are the main four themes for this workshop. I do not know if you have other items to add. In a sense they are the objectives but they also define the programme.

502 I think we can follow what you have written down there.

503 Okay. Thanks very much. I think it would be good for us to start with your feedback. I have prepared some written stuff for your feedback. So, I will share with you slide by slide and then discuss that. Who is going to give us the feedback from you?

504 Right, when you left this place I think you gave us the task of planning a way forward on the problems that we had at hand, which concerned, which were concerning electricity

break down is the institute [school] and the rest of the area where we live. So you made an action plan with us and we had to follow up the steps as follows: On the first question of the action plan, the question said, —“What should we do in order to improve the situation?” that is the water and electricity problem that was a scarce at this institute and the rest of the area. On the improvements we had to sit down with the rest of the stakeholders in Chigondo area, that is St Margaret Secondary, St Margaret Primary and all the teachers at Mutukwana and the business people, the agriculture extension officer and the District Development Fund [personnel], and clinic staff. We sat down in order to plan our way forward, that is how to implement or how to go about [addressing] the problem that we had at hand. So we wrote some dates on the part of the “When”? On 10 March 2009 we held a local meeting with all stakeholders. We discussed the problems and some of the things we had discussed here. We also showed the people who were present the letters that we had written in here [referring to the place where the change laboratory workshop was held]. When [after] the letters were read, it was unanimously agreed that each member who was directly linked to the water problem or electricity problem should pay an amount of US\$3 so that it would cater for [the transport costs of] the people who were chosen to go to the ZESA [national electricity authority] in Marondera [a provincial town about 100 km away] and talk to them. This was done on the 11 March all the monies were collected and on 12 March 2009, the people went there. We sent two representatives, that is, the two headmasters of the primary school, and the secondary school. When we sent them there, they came back and gave us feedback of which they informed us that the problem with ZESA was that of transport. So having that in mind we decided what to do.

505 Maybe, can I add, help him there in fact ZESA instructed us to find our own transport ... to bring them here, to go and fetch the ZESA people here and then they do what they wanted to and then take them back. So that was the main issue, ZESA had not vehicle. They actually wanted us to provide them with transport. They had only to provide manpower [and materials].

506 Okay.

507 Right thank you Mr C. for intervening.

508 With that in mind when the two heads came back, they had already exhausted the sum of money which was available when it was researched that in order to fund transport, the only amount that was required to for transport was US\$100. So when the committee was told of this problem, we went back again to the stakeholders and asked them to pay another US\$3 for every member or household and the amount which was raised amounted to US\$140 [not divisible by 3]. Mr Kanyera found his, the transport man; he had a friend who had a car, so the transport man was found. Mr Choruma was contacted and he agreed to carry the ZESA people from Marondera to this place, to the place where the wires [electricity cables] had disconnected ... They were carried sometime around 18 March and they came with ZESA people with all the material which was required. But unfortunately the wires ...

509 Maybe there is need to be clear that before ZESA came, they had actually asked us to approximate how many metres were required for replacement and they were actually given an estimate. So I just wanted to exonerate ZESA people here.

510 So the estimate was under ...

511 It was underestimated by us.

512 So the ZESA people came and did all their work but unfortunately the wires were not sufficient, enough to complete [address] the problem. So they left the work incomplete. And we had to sit again for another meeting, somewhere around the 20March.

- 513 In fact they had actually made an effort they asked if there was anyone who was positive to give them the wires [laughter]. They wanted to remove the burden of having to hire transport from us. But we could not come up with any wires.
- 514 Who made the estimate of measurements and ...
- 515 In fact, when they made estimates the first time, I think something went wrong with the wires again [meaning that more was stolen after measurements had been taken]. It was ...
- 516 Okay, okay.
- 517 It was cut, the estimate was right. It was, but then when word was passed people around the place cut another piece again [laughter]
- 518 And I think the only mistake made by ZESA people was that they know very well what the distance this pole and the next pole is how many metres. So they were supposed to ask how many poles were disturbed [laughter].
- 519 Right, with this in mind, there was a shortage of wire the ZESA people left the place without accomplishing their task. We had to sit down again and we found out that the stakeholders were really exhausted. Nobody could fork out another US\$3 again. So it was unanimously agreed ...
- 520 I think you also need to highlight the fact that when you came back for more money it was not during pay days and people had no money.
- 521 Right, right two school heads agreed that ...
- 522 The two schools which had agreed that each school should, since we were the people who were benefiting from the water they should fork out US\$50 each. This was done and we had to look, find another source of transport again to carry us the ZESA people from Marondera. We tried in vain to find somebody because Mr Choruma was already fed up or whatever had already happened to him or he thought that his car was somehow destroyed or overworked.
- 523 In fact on that particular day Mr Choruma had gone to his rural home. So the ZESA people waited for him, waiting for Mr Choruma at their workplace. Little did they know that he was in his rural home.
- 524 Is he from this district?
- 525 No, we do not know. And we do not know his name.
- 526 Each school contributed US\$50?
- 527 So after each school ... contributed, it was already holiday time [referring to school holidays]. The money was left in my hands and I took it to Marondera with another teacher and I tried to persuade the ZESA people to take the money and use their own means of transport. They disagreed with me and asked me to take the money back to St Margaret of which I did that. After seeing that the problem was getting bigger and bigger, and worse and worse, I had to inform our MP, our Member of Parliament, Mrs Goto about our problem. She also tried from the 22nd to the 26th or 25th taking [driving] a car to Marondera and asking the ZESA people to get into the car and come and make final touches on the wires. The ZESA people were always giving their own problems [excuses], saying 'We can't go today, the electrician is not around'. They were just dragging their feet and eventually on 27 March, it was on the 28 March, Mrs Goto left her home area and went straight to Marondera where she successfully managed to persuade the ZESA people to get into her car and then they came together at the place where the wires were disconnected [cut and stolen]. We worked with them for more than four hours. We were more than five, 10 teachers who were there and we worked from 11 o'clock to 2. That is when the work was completed. Was it around 2 or 4?
- 528 Around two.

- 529 You have gone places [laughter].
- 530 And the electricity was installed [clapping to congratulate selves]
- 531 From there we did not go any much further because we thought the water problem was okay [solved] but still have this thought with us that we should try and find somebody who can give us a hand in obtaining a windmill. This is where we are right now. So we still need to find individuals who are capable of donating. We still haven't found somebody who is capable. So we are still in the process of identifying that person so that we still have another alternative. If we have another problem like the one we have met [encountered].
- 532 So we actually we are selling the idea to well wishers and think Mr Mukute you can help us to look for donors. I am saying you can utilise your expertise in working with different people to help us fundraise.
- 533 At the moment I am a bit out of touch in terms of who to contact. But I think next year when I am back, we can get in touch and see if we can find some help at the moment I can't think of any, but I think that is a very good idea. So maybe we can discuss this specific solution and also the others that we looked at. I think they were four or five. How did solving this problem, process make you feel? How do you feel about what you have done in addressing the water and electricity problem?
- 534 At the present time, we are very, we feel great because of the achievement, what we have done because it was really a mammoth task to identify the people who should join the group, identifying the councillor as a person who is an influential members in the area. We talked to this guy [local councillor], tried to persuade him to lead us but he was always saying that 'you are the learned, please go ahead. I think you are a special group, which is leading this thing, let the group take its course'. So, because of the fact that we managed to make ZESA available, we all feel very proud.
- 535 Yes.
- 536 I was just about to say that the funny part of it is that it is only this group that is proud of their solution because we were following this, what we learnt here. But now the outside world, or other people, they do not know what made the whole thing to become as it is today. You see, some people, they just say it is the MP who did this thing but it is not it. It is a certain group which designed a solution, yeah.
- 537 Pupils, how do you feel about having power back in the school?
- 538 I was very happy when the electricity came back?
- 539 Why?
- 540 Because we had no water but now we have water.
- 541 Besides water, what else? Mr Mukute needs to know.
- 542 Watching television and listening to the radio.
- 543 You what does your father do with electricity?
- 544 Welding, his father does welding.
- 545 Madam, how do you feel about the whole process?
- 546 I feel very happy because the grinding mill was a problem. It was a problem say Mr ... [her husband who owns a pick truck] please carry a bucket of maize for me to Hwedza. So now it is easy for me to attend to garden needs, plus water and watching TV like he said. We are now comfortable.
- 547 I just want to comment on the importance of working together so well, like the problem was, the strategy which was used was to solve a problem because if you look at what is happening here, it is more of sustainable development. It was more of a partnership, especially for sustainable development, so it reminds me about innovation system, especially where all stakeholders are involved, each member working on his

needs, or his opinion. So I think if anyone can focus on the importance of working as a team...

548 Okay to add to what Mr B is saying, there is need for oneness between the community and teachers because if you look at this water problem, it was also come as a relief to local people because now they are coming here to fetch water. And the problem of the grinding mill, we used to travel as far as Mukamba, far as Hwedza, 20 km away carrying 20 kg of maize to and fro. It was tiresome. I think most of the community are giving the applause to the local MP, little do they know that ... So we need to work together...

549 Because the people were going to praise the MP, while a certain group, this unknown group. Let us just say our God knows [laughter].

550 What lessons would you say you have drawn from taking part in his process of developing a solution and working on it until you get the results, also inviting the support of other people?

551 As for me I have learnt that if you see is there is any problem, to solve the problem, it needs people who are involved, to take part in solving the problem. They have to be consulted for ideas to solve the problem and also even to make contributions. Before contributions, people, it must be clear to them what caused the problem, and what the effects of the problems are such that when you come to contributions, people are willing to put hands into their pockets for contributions.

552 The other thing also is that we just need to be responsible citizens, by this I mean, we must not destroy things at random, just because it doesn't belong to me, because if we go back to the root of the problem, it was a question of irresponsibility of as citizens. We just need to be responsible with things that we have. I think this is one of the most important lessons from this problem.

553 I think the people who did the job, they initiated development of ownership over land, like what we used to do let us say the road. You just say this is the District Development Fund that is responsible. Someone can even use something that can disturb the road, saying there are people who are responsible but people just say it is the property of ZESA.

554 One lesson I have learnt from this is that knowledge is power. Without knowledge, we cannot go anywhere. By the time we found out that there was no ZESA [referring to electricity this time] in our area, we had to look around and find out the source of the problem. When we identified that we also ran around to find people who could help us. With knowledge, you can do anything. I just want to thank you for the programme you did with us because it is really an eye opener to us. Maybe if we had not done this workshop otherwise by now there will be no electricity because we would not know where to start from. So with the knowledge that you gave us, we gave this knowledge to stakeholders who really appreciated it. We utilised it and we were able to come up ... to tackle the problem of electricity. We conquered it because of the knowledge that we have.

555 To be honest, I did not expect you to have moved as far as you have moved. It is quite amazing. It was in March and a lot of things happened. Congratulations.

556 Maybe the other thing for me to say I think we also need to appreciate that teachers are torch bearers, and the truth is that teachers also need leadership. If we had no school like St Margaret, would we have been able to... The effort, which was initially made by the teachers, it was tremendous. We had vision beyond watching TV, a vision to help the community as a whole.

557 I just want to thank you very much. You see, it is like when you come to soccer. It is not the player in fact the very person who suffers the blow of failure is the player more than the supporter he suffers more than the supporter. Now, you see I am within [the

soccer field, not the terraces], as he is saying now that I have become part of the project, a player. Now I am reminded, when you were asking about another device to pump water, I just want to say our partners, Environment Africa, it has a programme of taking water to schools. I think you have to ask Mr S. or else we can write an application letter asking for this thing. Now you see, I am that player now [laughter]

558 A very key player!!!

559 I just want to add a little about what has been said about the teacher. The role of the teacher is not just enabling the child to know one plus one and how to write but you also have to teach the whole concept of life. So it was your responsibility.

560 In the team that was leading the process, did you have members from the community, was it only teachers?

561 Members of the community were the B. family [the committee did include the agriculture extension officer and the local NGO programme manager who appear to have been too busy to be _players‘ but served as _supporters‘].

562 That is great.

563 I just want to come to involve the kids. Tinoda kuti muve vanhu vari responsible. Haikona kuti rega ndipwanye mahwindo not kuti ndapedza giredhi 7, ndatopedza zvepano. Nokuti mangwana kana in 10 years‘ time, mwana wako anozoshandisa chii? Those same materials dzawakapwanya? Kana kuita ticha pano wozoshandira kirasi isina mahwindo – awakapwanya uchiti ndependza giredhi 7yangu. Ndinoda kuti mupabate ipapo vana, nyangwe muri kumba kwenyu, nyangwe muri mucommunity chengetedzai zvinhu. (We want you [pupils] to grow up responsible people. Do not break window panes in the school just because you have completed Grade 7, because you are done with this place. Because tomorrow or in 10 years‘ time, what will your child use? Those same materials that you destroyed when you completed Grade 7. I want you to *carry* this in your lives pupils, wherever you are, be it at home or in the community, look after resources).

564 Thanks, the other problems were not as big they are still important. There was a problem about cooperation among teachers. Then there was the problem of tools and solutions. Did you go any farther from modelling?

565 Cooperation, what else tools, ...

566 Yes and there were transport and marketing problems and then gardening tools and cooperation among teachers.

567 I do not know, if time allows because we were supposed to meet earlier and need to meet now to put our notes together, to sit down around together for just five minutes, maybe 15.

568 Does [will] that cover all three or specifically transport and marketing?

569 I think it will cover all the three.

570 So we can start [reconvene] at five minutes to [11].

Research participants meet to discuss how to present progress on the other three areas. But this report will cover the transcript will cover teacher cooperation; transport and marketing (not garden tools).

Part 2

Presentation of progress on teacher cooperation in the school

571 We had an assignment of cooperation among teachers. I think by the look of things, cooperation has greatly improved in the school, why? I would give credit to the workshop

we held. When he gave report back [to the headmaster and other teachers] about what was transpiring they were quite happy. So I think this workshop actually improved our cooperation. Secondly there was no problem of teachers transferring from this place. So we have retained old staff. It helps in mapping the way forward because when new teachers come in they come with new ideas. The ideas may be good, they may not be good. And you may end up with things that are not okay. And also I think the other thing which has also helped in enhancing cooperation is our economy, which is also promising to stabilise... we are still on the road to recovery. I don't know ladies and gentlemen, is there anything I have left out on teacher cooperation?

572 It is okay.

573 What did you actually do?

574 Sorry.

575 What did you actually do to encourage cooperation among teachers?

576 I think, as I have said that when you left, we convened a meeting with teachers then we highlighted all the things we were discussing in the workshop. So cooperation among teachers we discussed what we can do to improve things. In fact, we were focusing on how we can improve our Permaculture here. That is when we came up with all these ideas the we need to cooperate, we need to respect each other, we need to respect the man in charge, we need to respect the teachers we are working with, we need to respect the children we are working with. So I think it is one of the things we did and that is how we came up with this thing: some lessons we did with teachers, some sort of induction because we wanted to build a new things.

Part 3

The transport and marketing problem (supply demand misalignment, too much production versus too little local demand)

577 The other thing we looked at was transport and marketing, right. Firstly on transport, I think it also improved since the time you left. There was the introduction of a new bus, by Ndezhashe Bus Company, which is operating up to now since it started and it is promising to be reliable. Secondly, we have also Mr Museba who uses his truck on a daily basis. I think he is one man who is helping this place [by providing transport for people and for produce]. I think Mr B can bear witness to this.

578 Yaa sure.

579 Most of their produce is carried by him to Hwedza [referring to the district centre about 25 km away]. And also we have Mr Masungu. He is one of the local business people... all these gentlemen they are helping us with transport to carry our produce... Because the bus that was operating in this area, Manica Bus Company, it had established a very dangerous monopoly such that they had come to the point of increasing or changing bus fares everyday depending on the number of passengers. And then marketing, it has also improved. Why? Because of the introduction of the US dollar [local currency was out of circulation officially because of hyper inflation running to over one million percent], which has almost established a name in every household. I think it has helped improve marketing.

580 I just want to add on transport concerning marketing. You see this man Mr Museba, we can even talk to him concerning our produce. Then he can carry our produce without asking for a cent before, we then pay him later after selling produce. And we even talked to the people of this bus company Ndezhashe about carrying our produce because the company that was operating alone before, it used to charge exorbitant prices to transport

our produce and they let us down when it came to making profit. But now we have these people and they really understand what we are talking about such that they carry our produce at a reasonable price.

581 Okay.

582 Coming to marketing again, you see here, things that are sold here, the prices are dear compared to Harare or Marondera. When you market at district level it is an advantage because the bundle that costs a dollar is smaller to that in Harare or Marondera.

583 I think to add to what Mr B is saying, that is normal where there is a lot of demand as in big towns to can sell a lot and make small profit margins ...

584 I want to add more on transport before I go on to marketing. In transport, we have got a number of partners ... We have Environment Africa. When their truck comes here with building materials we just load it with our produce to carry it to the market on its return journey. Then on marketing we saw that some people in the community, they have got vegetables more than the demand of their families. So as Chigondo Environment Action Group [established with the facilitation of Environment Africa, a national NGO operating in the area], instead of moulding that centre as a honey processing centre, it is now a food processing centre where we are going to buy whatever is found in the community so everyone can bring produce and process those things, those perishables. When they are processed, they gain more value than if they are sold in the original form. So I think that is the other improvement in marketing. We are working and very soon, otherwise when you come next year you are going to meet [find] a queue of women from the community bringing tomatoes, vegetables, or even fruits. Because now some of the fruits, they are decaying or get eaten by birds or other creatures. So we are trying to make use of all those things.

585 So the actual actions that you took in terms of marketing and transport are: approaching transporters and negotiating prices for the transportation of your produce. And then I am not clear about value addition, the processing centre, there is a honey processing centre?

586 Yes.

587 And now has it become more than just a honey processing centre?

588 Yes.

589 What kinds of foods are you processing?

590 All kinds of agro-products but we are to process these things naturally ... they will be more expensive than those processed using unnatural means. So we are going to use methods which were used by or grandparents.

591 Any additions on transport and marketing?

592 Yaa I just want to add something on the school practising Permaculture. I think it is going to be an easy path for us now that there is a processing centre close to the school. Our produce will find a ready market as soon as they are ready for harvesting, we can inform Environment Africa Action Group that we have such goods and we negotiate the prices before we harvest them from the fields. So marketing is going to be easy for us.

593 Then I think it is three days ago when we had a general meeting at our centre. We discussed the issue of forming an association. So that association will lessen the burden of both transport and marketing.

594 So what exactly are the plans around the farmers' association?

595 To recruit all interested farmers, then we are going to design everything that is essential for an association, such as a Constitution, joining fees, the laws, so that when we are together our voice will become stronger. We can make an inquiry for [access] loans, buying a truck or other things such as materials and seed for improving production.

3. Case Record Case Study 2

3.1 INTRODUCTION TO ISIDORE CASE STUDY

The case study was based on a network of organic farmers in Durban. The farmers produce and market most of their produce through Isidore farm which has marketing organic company called Earth Mother Organic. In this network there are trainers who support small- scale farmers and other organisations interested in producing organically. The trainers also carry out consultancy. The process of negotiating access began in June 2008 and I left the field in this case study in November 2009 soon after holding feedback interviews.

3.2 NEGOTIATING ACCESS

Access to the people and places in the case study was negotiated through one of the organic farmers and is also an organic trainer. Below are two letters concerned with access negotiation:

--- On Fri, 27/6/08, Eva Muller <isidore@telkomsa.net> wrote:

*From: Eva Muller <isidore@telkomsa.net>
Subject: Re: Brett Muller & sustainable agriculture
To: mmukute@yahoo.co.uk
Date: Friday, 27 June, 2008, 10:08 AM*

Dear Mutizwa,

Thanks for getting in touch.

I am looking forward to getting more information from you as to the nature of your studies.

As you know there are fundamental issues regarding the development of sustainable agriculture in our country and I desperately want this to move forward in a constructive manner.

I built my first catchment dam over the last two days and will be linking up about 400m of swales to it over the course of the next two weeks. This is a very exciting project I am working on and covers an area of 3 acres and will contain mixed production of vegetables, fruit, herbs, flowers & medicinal plants. We are filming the entire project with the intention of producing an extensive series covering projects of this nature. Media is powerful and it should be used for good wherever possible.

Looking forward to further correspondence.

Brett.

From: [Mutizwa Mukute](#)

To: isidore@telkomsa.net

Sent: Wednesday, June 25, 2008 12:19 PM

Subject: Greetings and thanks from Mutizwa

Dear Brett

It was great meeting you during the PELUM Workshop on Food Sovereignty. I was amazed by how much as an individual you are doing in the area of sustainable agriculture, more specifically organic agriculture, almost single-handedly.

My reason for writing this e-mail is to re-affirm my interest in partnering with you in carrying out a research concerned with exploring and expanding the boundaries of workplace learning in sustainable agriculture. I will be sending you more information about the nature of the study in due course.

Hope you travelled safely and wishing you all the best.

Mutizwa

3.3 SAMPLE INTERVIEW TRANSCRIPTS

3.3.1 Interview with Eva Muller # SA1

MM: May be we could start of by you telling me about your history in farming general.

EM: My history in farming is that I've got very short history in farming. Actually I am of Austrian descent. Our families always had allotment gardens outside the cities. We moved to South Africa when I was very young, when I was about six months old and my mother always had garden, vegetable garden. So growing vegetables to eat was part of my life you know, never knew anything else – was part of it. My sister and I always had a dream of doing some kind of community garden more permaculture sort of hippie community kind of thing base on the fact that we have friends and had sugar cane farm stay and used to go up visit once we could drive it, I don't know, I had my driver's license when I was eighteen. We were quite independent and we visit down there often we thought that it was ideal life style. It wasn't based on the sugar cane farm itself which was highly chemical and technically orientated kind of farming. It was more on the farmer's wife who had a herb garden at the back which was just beautiful it was. She didn't know what she was doing permaculture or organic system there, but that what was she doing it seems very romantic and idealistic and lovely to us so we thought always we do that and then our parts come and split my sister and I. I went overseas and my sister stays here. She got married years and years later I met Brett. And Brett was very interested and had been doing a lot of really Permaculture stuff around South Africa and setting up little gardens all over the place and by that time Dorris had already her husband and her had bought this land up in Assegai which we on now, she had carried on with thought of doing something and found this piece of land with all this avos, it was a very, very beautiful land. It seemed like a right setting, she and her husband invested this land but they haven't been doing anything with it. After I met Brett, I said Dorris got

these I wonder if she has been interested in actually doing. She was within a short time we moved to the land the really work on the farm starts and I started doing Permaculture courses and actually working with the land first on a very small scale and then as we grew into it, at the larger and larger scale.

MM: What kind of courses did you attend?

EM: I did a proper Permaculture course a proper Bill Mollison accredited Permaculture course.

MM: How long was the course?

EM: It was also only a seven or eight day course may be two weeks I can't even remember. It was actually a very incomplete course. The final thing that we supposed to do, the course was run by the people that were at that point also in the beginning of the teaching sort of career and they were plagued by lots of things like they were outing in the area which was very compromised. The computers got stolen and this and that, the next thing I didn't even, the last thing we had to do the own land we never completed that he never came back for that.

Exercise for practising. Yaa, exercise for practising but my knowledge largely I learnt the principles of Permaculture and a handful of very effective principles. I could immediately put into practice because we have the land. Together with Brett who is very practically minded and had done this kind of thing, you know, I picked up all that very quickly.

MM: Organic farming how does it come in, how did you learn about organic farming and how did you see been related to Permaculture.

EM: First of all how it relates to Permaculture I expect, I have never seen Permaculture system that wasn't organic, I never seen them spray the Permaculture system if they will do that it will not be Permaculture, so that goes without saying. Permaculture is a degree of organics, there are so many different degrees of organic farming that you can get. Permaculture as far as I understand is very nature-orientated way of sustainable living, it's like no farming, farming although that is also an illusion once its gonna do work with this way or that, but how do with the organic it never crossed my mind to apply chemical ever in fact that now you ask me that question, it is the most foreign hideous thing that people apply chemical and pesticide to plants vegetables when is not necessary. You know, let them explain there I would be interested to hear in agricultural pesticides orientated farmer, explain why they do it, you know after there are so many example of (my part so many examples) of doesn't have to do it no one to spray and probably boiled down some of the assumption in my part down into economics and idea that one producing so much more if you control every experts of your farm by a chemical and motor input, that means tractors, those pick huge, spraying machines, aeroplanes wonder what that may make big, may be the bottom line is the money orientated one but as far as I concern wouldn't cross my mind. So maybe I'm born this way.

MM: Why did you choose to practice ecological agriculture Permaculture organic farming?

EM: I lived very city based life style for a very long time and I enjoy my life very much travelling to big cities all over the world, but once I met up Brett and we were having our first child I realised that there are huge change on the cards for me and based on the dream that I had before with my sister. It was quite natural path to take for me. After my first child was born, being used to a quite affluent type of the lifestyle I had to really cut back out of my

existence. I went and look up for a job somewhere and I found this job in a flower shop I wasn't been pay in that much and I started thinking you know I could done Permaculture course farming and we were doing organic farmer what we were are doing I thought that we can just start selling vegetables from the farmers I knew. I knew some groups that are started up with organic farming already and they were producing some beautiful crops and everybody is always looking for a little bit of extra for their surplus. So I started buying vegetables from those people and selling them to people that I knew. My first overhead was R50 out of the boot of my tiny, little Corsa. Before I knew it, I was out of the Corsa and into Brett's Chevrolet and I asked my sister to join me, because it was really too much for me, that was after about a month and half of doing it, that not more than that. She joined me we used to drive around in Hillcrest to all of the shopping centres just to take back of the tarpaulin of Chevrolet all the secretaries used to run out buy vegetables also at the back of the truck until they stopped us doing that. Because we didn't have legal rights to do all the disrupted work even in that case that reached its ceiling and we start selling in the markets all over Durban. And then the market in Durban they also reached their ceiling because the veggies are very seasonal, the income was very, very determined by what season we were in. When we went to the winter season, spring it was great but the minute you go towards the end of summer became not sustainable because the vegetable production went down very, very badly because here in this region, the end of summer is like the middle of winter in Europe. We haven't put, it's too hot to put the new crop, the new baby seedlings in and the old stuff is going out so we haven't got succession throughout the rest of the year there is the succession from about February but its pushing it already. January, February, March, April, there is very dry period in vegetables. We had to find another route. All the time we were building up this farm though.

MM: So what route did you find?

EM: Water in the organic and food from Europe and then we went into retail, we got a shop we cut the market down into very few and now we got one of them left the Shongweni Farmers Market.

MM: How many did you have now in that point?

EM: We had aah, I've got to count. A good ten

MM: Okay, now you have got one

EM: Apart from the one, now we have a very nice shop in Belmont road in Durban, we got three markets a week there. We sell fresh veggies on market days at our shop, so we have created our own little mini market but the one official market we still do that part of Durban, sort of picture is the Shongweni Farmers Market just down the road from us here Assegai.

MM: Okay.

EM: It a very early morning farmers market and we started with that one and the next one we are still doing. All the other ones we got two involved in our retail to carry on doing that.

MM: What difficulties would you say you have faced in the learning of Permaculture organic farming and its practice?

EM: I would have to say a biggest obstacle would be trying to convert organic farming into a financial sustainable project in too short time. We also at beginning taught we will do like

quick, quick but it wasn't going to work. What we found working was networking with other farmers. So during all this time we built our business which is called Earth Mother Organic material moving from the market. We have been building up our own farm all this time. We've been doing a lot of soil feeding and all of that at the beginning we did try quickly turn to a profit by overnight, quickly putting in crops and harvesting but we encountered many difficulties with that because our farm infrastructurally wasn't ready. Our farm labourers, everybody had to be taught the way our system was, but didn't happen overnight. Our own learning on our own particular farm wasn't on the level, it took much more time, than we estimated and then of course everybody was just around, because we made promises at the beginning, yaa this is gonna happen over the year that is going to happen, now we are eight and half years down realised that this thing take a hell of a lot longer, you've got find if you working in the field like organic farming you need to network with other people and do, may be do what we doing start community markets where everybody does a small supply like we does, could all suppliers and has established avocados orchid. So we would bring avocados and another little project they grew carrots, spinach and we got spinach and carrots stuff from there. Another little old lady she does, rhubarb and Madumbi, sweets and different things, we got that up from her, and we just networked with the lot of people we have a huge variety of vegetables without having supply from our own truly fledging little farm. We didn't kill our farm with very heavy farming. We have tried at the first year but we saw quickly how, because of what we have been done with Permaculture, we soon saw and observation as Brett said, is the biggest key and our farm wasn't gonna do it, so networking and working with your people that are passionate with farming and even gogo has got only tomatoes, then you've also tomatoes to sell and by getting involved with markets, you have of course got so much resource because so many people that can be drowned in that environment. But people are interested in buying fresh vegetables and those that are growing themselves. We treat the years always happy we put the interest, some people bring us the most interesting types of seeds and organic seeds that you'll never getting exposed too if you were just on your farm, doing farming, farming in a very way of sort of narrow environment. But by opening yourself up to more interactive thing with customers you get so many more experiences and influences what people want where you going with your whole thing, and so your whole farming thing becomes guided. Brett said a very true thing, once got a garden of the people as resources, because there are people got their own experience and a wealth of the information and tools and sort of things when interaction can happen and minimum of amount towards and also academic because lot of people got a lot of knowledge if you put them together and we find that all the different components supported each other and I would suggest everybody doing organic farming and has got a little piece of land, go the crops that don't kill your soil and that will feed your soil. Start up the community market in your community. It doesn't help to look at other market where you think, oh look we can go to this market because this is an affluent area got completely different standard. They want their stuff package and marked and labelled and basic the sales person has to be manicured otherwise they don't believe them. It is so much easier just to cater to your society at the level you are at. Whatever level you at you may never make a thing with relevant make a small profit to sustain yourself and you'll be involving in other people in the community and that it will be sustainable it's not that only you depends on your profit or turns your profit, you are providing a market platform for other people as well. I would say networking is very important and time, time, time, give it time.

MM: I think the other question probably I wanted to ask you, you already answered in our discussion I wanted to find out what are the other sustainable agricultural practices did you

use on your farm. You see some people just take the holistic management because they are looking after the animals. Others take organic farming or agro-forestry and stick to it and others are trying to be good aspects on each kind of your practice so that they can have something that they can.

EM: I would be inclined to say diversity answered everything even if organic business that we doing inorganic we find diversity of stuff is the most sustainable thing. To focus on one thing is, the table is got four legs doesn't stand with one leg you know ... you need diversity definitely look more at the organic vegetables side of things up in a organic food, but within the organic vegetables we do, but the huge diversity crops we don't just farm the lettuces or farm herbs we just do single thing. Brett is the carpenter and so we do have certain plants which we can consider very invasive and are very that are very good trees, so something we grow obviously in a control manner because it provides certain elements that we can use. Other sustainability we got our own water and we definitely got in the water harvesting thing and that again we also thought put in a five year plan to do this we will do that or have total differently plan for us because there was no way we were at the level to get a pump or any of this things 3 to 4 years ago. Somebody would have financed it up but we didn't be able to implement it and they will collecting dust while we learnt how to manage to all of these, so it took us time to learn how to manage our land and our resources because we are not book-learnt except of that little bit that we had our passion our dreams very practical hands on this analysis. Both I and Brett direction but we are not book learnt so to put in system using a lot of money would have been a total waste on us. But one of our biggest resources is water on this land, we do have it. And we learnt how to carve the land or landscape in the way to maximise the amount of water we have. And also we got, in the Permaculture principles, there are certain principles how to harvest water off roofs and we haven't had very steep roofs that are that harvest a lot of water. And then we started the tank system, collecting water into the tanks, the swale system which amazing Permaculture, swales and bends and how to stop soil erosion due to heavy rains which we do get here, and then we were ready to get a pump. Once we knew how to do it with the land – and then we have got a very small team here, so manpower that is another thing. We were ready for the pump now the pump is such in an effective thing of time to complete dryness and drought we got an oasis here. But it wasn't in that way, even three years ago. Other resources are seed harvesting, our insect population. With got a pig. Our pig uses a lot of, our shop that's an organic resource for us because our shop has now got a café attached to it so we bring all the food waste which are organic because are organic we bring it all back to farm. We put it in the compost heaps, we put it in our worm farm ... it in our pigs, we got one pig which is not very friendly. And all goes that goes out of land and goes back into vegetables, and vegetable goes back into the shop to the markets and to ourselves, everything we have now become interlocking and sustainability and itself even people are sustainable organic resource that we have here. My sister, myself, Rehini which you gonna see her later will join us, recently it has been one foot of other process because the right people comes as the time goes and slowly short build it up. Other sustainable practices – now we gonna start with seed harvesting.

MM: Is it something that you have been doing?

EM: No, I haven't been ready OK. That's another thing because for seed harvesting you need a proper seed-drying facility and this time we have tried just to sustain our own family financially and to get to some kind of a point that we can live because we do live a very mainstream money-orientated society. Let's, we don't live out on sticks, we live in an area that has become one of the most affluent area, Natal it wasn't like before, only recently

everybody wants to move Assegai to Hillcrest it's all flocked much other stress because it used to be agricultural land and we got subsidised for rates and taxes and stuff, now anybody that we are the only one doing farming in the area which is agriculture area. So rates and taxes are high, electricity bill are high, water bill are high everything we do is money orientated even we are going much more we see a huge need for putting in to feeding because we do believe that the system and we can see all around us food are getting more expensive all the big things lot of places have been repossessed houses, cars are being repossessed.

MM: How much learning do you do from other farmers apart from within the family you did you talk about the market as a very useful place for sharing of knowledge are there any other places where that happens between among other farmers?

EM: Of course if you go out to, sometimes business is taken us out to a very, very challenge areas. We farmers we in spite of huge challenges are managing to grow stuff because of the passion alone and this is the very important thing in organics. Now organics becomes such a thing people say oo yaa is the biggest growing in the street blaa blaa, again the money. Without passion and some kind of draft would doing it because you love it, you are not gonna do it. The lot of these farmers we have been in hugely inspirational because of that label and it doesn't matter who it is, even our biggest farmer is inspirational to us in the way that he can't live of organic farming he does other work but he has got a labour force that he sustains through the money organic farming brings in he was one of the rich people, like he used to travel around with the donkey car like clients which are much older remember him he drove around with the donkey car and what we find the lot of the farmers, the lot of our people we buy from we bought from the beginning eight years ago and we are still buying from them now. The lot of those they don't have passion to drive, not all around anymore they start and then we've gone we are still put the same core group that we started with. These people are a huge in amount of teaching that they can do because they are passionate and you'll find, nobody can you give all the answers but some answers can be given and gotten by all of them and I also find that you can only learn as much as what you can you really want to ask, at the beginning I asked about the seeds but sometimes you can get information overloaded and become so much you don't even know anymore where to put it in your brain. The best thing is just to start and ask question pertaining to what you have done and it is well information of people actually doing it. The best way to get further as far as information is concerned is if in your area for example, go and look at those gardens that are doing well, go and see what have they got planted, what plant have they got in and why is it that day are doing well and probably be a little old gogo who has collected her seed that keeps going, that knows exactly the times, the things have be to planted that observe nature and go ask question there, they have the most answer that is in the end boils down into your little piece of land, which tree is shading out, which piece of area where can you not grow mealies because it gonna to shade for too much time of the day, and ask people in your area what are they doing and why their thing is working so well.

MM: Now we look at farming in general at the kind of farming that you are doing what strength and weaknesses?

EM: The organic type of farming we doing, the huge strength is sustainability, we can if the electrically group falls and say that a big army happens I mean I don't know if everything falls away this farm will still keep going. We might have to carry the water with buckets, but if we can't get people to work on the farm there will be a lot of other people including Brett and myself. And we might be watering our crops with buckets and not with the pipe system

but it will still keep going because we can get from our crops the seed for replanting and the food for our family. So that is its biggest strength. It has got a huge amount of resources and we are not dependent on anybody outside to help us control any aspect of the land. We can create our own compost heaps to feed our soils. As I said earlier, we don't use pesticides at all. That is its biggest strength as well. What is its biggest weakness? I actually don't spend so much time thinking about weaknesses. It's nature. It doesn't have weaknesses. It is only when you don't apply nature properly, then it is going to teach you that whatever you are applying is not the right way. I just find that if you come across problems and there are problems, they will guide you to the right way. If you don't do your contours properly, you gonna have a big problem with top soil which will be carried by water. So these are the problems that may be faced if things are not being done properly.

MM: Now if you were to score out of 10, these three aspects, of the ecological, economic and social, how much would you score the kind of farming that you are practising, out of 10?

EM: Ecological rating I would score it at – 10 out of 10 is nature, 10 out of 10 is somewhere in the bundu where nobody is doing anything but because we have to eat, ours will have to score 9 out of 10 because we are still manipulating a natural system to a certain degree because we have got to eat and we are putting crops in there that aren't indigenous and we are using nature to sustain ourselves.

MM: And economic?

EM: That depends on which year you are in. Year 1, you get 1 or 2 out of 10 because you are able to eat some lettuces because you don't have to spend money buying some lettuces. And I would say year 15 or 20, I would say 9 or 10 out of 10. But that depends so much on the individual. It depends on where your own values lie. If you want to drive a Jaguar, this is never going to be a 10 out of 10 for you.

MM: How about addressing social issues?

EM: 10 out of 10.

MM: Can you explain the score?

EM: When people are growing things and when people in communities are growing stuff, to stay in the community and you are doing it properly, you are involving other people in the community, poverty doesn't exist. And if you have got food and your food is poison and pesticide free and your community isn't riddled with disease, immune diseases and deficiencies, your brain power will be so much better, your community will be so much better. These people who are inclined less towards farming and more towards academics are gonna be so much more able to use their talents because their bodies are so much stronger because some people are able to sustain the community with gardening and farming. And with these community things, you need human resources to do those kinds of thing. In an ideal world, if things were not so money-driven, you would have a 'this is the starting point of a totally balanced community as well'. Yes, it would be a 10 out of 10.

MM: In terms of division of labour within your family, who does what and why?

EM: Division on labour in our family and I will include my sister and the people who are down at the shop, it is crystallised now because we all of us have filled a different niche. Brett is very hands on, he does all the heavy work but I am much more inclined towards

planting and detailed so of conceptualising kinds of things. I am much more an in-my-head kind of person actually. I don't move soil around. Brett does a lot of the infrastructural stuff with tools. How can I explain this, he doesn't do the planting and I do the planting. My sister at the shop the does the merchandising, the liaison with people. She is more a peoples-person. Darine runs a retail shop. All of us have got different talents. I have become much more involved now at the shop, the café. And we started a plant nursery that is why we got Rehini that does the marketing of the vegetables more although I am running the books, I don't know, we all interlink. Then our guys in the farm, Skumbuzo has developed a huge talent of making compost. Now this is the backbone of our farm, the composting process and it has taken us five six years to make an incredible compost heap. And Skumbuzo is very good at that. Brian is on crutches. He does the finicky, finger, tactile kind of work. He is very light. He can seat in the bed without compacting soil. He plants like a machine. You can measure the distance between his plants with a ruler. All of us have got our different talents and in the beginning we all did everything, we all did too much. We have got somebody that comes in now and harvests. And this is also where you can see the sustainability of the community. Nobody here works full time except Brett and I. Our guys work four days a week and they work from 8 until 4. So nobody is overworked. We do have two guys. This is a five acre property. We have got two guys that work permanently and Dorris sends a guy twice a week. So basically the people that are running the land are two people. And because of the practices we do, those are the hours they work. The farming is relatively simple and sustainable but over the years it has proved who has got the staying power to do this. And who and what talents does everybody have and what likes do they have, you know.

MM: Would you say there is someone who does the more difficult work?

EM: It depends what they like. I can tell you I will not enjoy digging the soils. The work is too heavy for me and also I am not visual person in that way, Brett can see where the soil run and do that. I can do the A-framing and all that has to be we can basically do everything but we've got likes and dislikes. So if I had to do swaling it will be very hard work for me. I wouldn't enjoy it. Brett loves that physical, he will be the one who is doing the hardest work. Organisationally has to be me, but that will be very hard work, Brett does like that so much. The computer work and ordering vegetables and organising different things that kind of stuff that goes to running the farm, the desk work and also planting. I think that as far as hard work, hardest work, who does the hardest work, who does the most, if you ran the area that you don't like doing and that is not your talent doesn't suit you its gonna be the damn hard work and then your own characteristic person of persevere and enduring will come out that is it. If you doing something you love can be a physical grinding as anything but you will still enjoy it. So, yaa I think it's very important that one sees who the people are recognise what they like to do and put them into those positions in as far as possible

MM: Now you have learnt a quite number of things but you have been also creative in applying what you have learnt and probably few more things. Can you explain a little bit about kind of changes you have made?

EM: Let's take Permaculture for example my biggest thing is like in the beginning lawn, grass lawn was big a swear word. Nobody has lawn, well the first children arrive and the first thing I put in the after the child running around was lawn because one of my greatest pleasure is that the children run around outside have ride bikes and have their friends over and enjoy this very beautiful environment that we have but we don't have a lawn and I can kick the ball around and I have none of that we can have a hell of work and that some of quite artistically

inclined and my creative expression goes very much into my flower gardens. So one of the very most important components to me is an area of tranquillity and any garden is very important. And area where you creative your expression comes out and you can plant an edible flowers, but definitely adapted my knowledge of organic farming and Permaculture farming over into my flower gardens and I have a great pleasure and there again someone and is employed only for that. She is only concerned flower garden and I've got. We have somebody that I went to locally nursery and that time locally nursery was on short time and they were very good people that have been learning the stuff for years the organic, the planting. No organic knowledge, she doesn't know about organic she is learning new stuff but she knows about flowers. She came and she helps me here with the flowers and she is learning inorganic principles but she got advance knowledge of that, interesting thing here she is a sangoma. She knows a hell of lot about medicinal plants and so does Leonard so there we go again building your knowledge and resources and bringing people onto your land. So through my flower garden and in my passion for flowers garden, this woman has come to land because and a knowledge of her own, so that I added at my own thing, the quiet space directly around the house which absolutely not Permaculture. Permaculture is having your vegetables closer and basically you have your lettuce garden around the garden which we did, but for my very active mind a garden constantly in flux didn't suit my personality, it suits my family and so we adapted that.

MM: And then your local beliefs the rules that turned to impact negatively or positively on your practice that you have already talked about that is only affected the rates. Are any other really sort of rules or even local traditional believes that have an impact negative or positive on what you are doing.

EM: Of course we live in, again if you gonna go with your head through the wall of the area in the community live and you gonna have negative impacts. We live in a community which is largely Zulu-based. Now there are certain hierarchical levels in a Zulu culture. If one can accept and work with those then one doesn't have problems, but if you keep fighting that, then you will have problems. Like with the people work at the farm there is a hierarchy like who came and who started working on the farm first. I grew up in Johannesburg and there was no such thing as the head of the house and this and that thing. Brett is the one who speaks to the farm workers, because the man take authority from the head of the house which is the man, so a lot of the staff and we found that the farm runs so much better if we stick to that principle even though we very much a team, and the labourers of the farmer workers are the guys that helps us with the whole thing. They see that there an equality between Brett and I but still he has got more influence on them when it come to doing stuff and in taking instructions. If you appreciate the culture differences and you can adapt yourself to that, then you can make something really, really amazing and big out of very, very little, you'll see now how much land we've got and in the week you also get into a meet Brian, Sikhumbuzo and Leonard and you will see that huge amount can be achieve with very little human input as long as we work well together. Once we got address that we all human beings and sometimes we've got our good days, sometimes we've got our bad days, we've got to learn about each other. I mean it's not only us that had to learn about their culture. They had to learn about our culture from Johannesburg we very go get the kind of people on the wall full of dry like they couldn't believe at the beginning how much, even Brett you know, the way my mind works and how much drive I've got up . I had to also realize I had to slow down in this scenario as I said at the beginning the farmers are the biggest teacher. Oh gosh everything I wanted overnight all these cause stress to everybody but at the same time that drive also made things get on the feet very quickly and my sister as well all of us we got to learn who you

with, in your community. Of course there are certain practices which are hard for us to understand like not to understand but to live with it for example, recently one of our dogs got killed and snare because still to this day the people are lying up traps to catch the duiker and that for us is like when one of our dogs is get caught and its horrible you know, and the worse is that snare was on our land. So those kind of things but even that, this is where we live we got accept that this is we've chosen to live here and we've got to live with these things. It's the way is. We also haven't chosen to put up big walls and fences around our farm because we find out it's much better in this community with people. If you go to Kwaluzwa or Molweni or any of these places where people live, Jaji, our nanny, she comes from Shongweni in that side then, the wall and fences are up. Everybody says hallo when they pass on the road everybody communicate with each other, there is the sense of I know you I say hallo to you when I walk pass you on the road. Brett and I have not put up these big fences on the wall, we have, we know the guys that walk down from the other places the other farm people that come and work, every morning they come pass and every afternoon they come and pass and we have got an strange if I go to Hillcrest and the see one of the guys they wave and I wave back I know them. So, there is such a foreignness always the white people hunt the big walls, the big walls. There is such a people don't know each other and don't communicate such a foreignness between people. We are very different but at least we say hallo to each other out of the wall so the people can see what we doing and the lot of people buy muti plants or get herbs from our wetland through Leonard because to look here I don't know for stomach buck, headaches and lot of people have seen how we farm and have really been influenced than admire Brian on his crutches who manages to do all these things. He is the very, very interesting guy and some not all having our high fence is having do other people can see even planted some things on the fences then offer the people to pick. There is a huge granadilla that grows drops a biggest huge but actual called a banana... dealer or guavadillar; it's a gesture of good will from us that we are willing to share

MM: Do you have any other comments? About how you have learnt to practise Permaculture and how you are linking to the market as well, Permaculture organic farming?

EM: The most I've learnt about farming is by doing it. Just do it. That is the most important thing start to do it then you learn huge amount with doing it kinds, right questions, right people and you got have faith and you have got believe and you have got passion. Linking with the markets in what way you mean?

MM: A lot of people who practise organic farming, failed to go to the next level where they realize money from it, its usual but it's not usually lot of them go and find and produce themselves not surplus and do not go to the market business it's quite a different field but you have manage to link them quite well.

EM: We are actually turn it was flipped over, my sister and I had a necessity to own money and I was my settle not we gonna sat as secretary and other desk anywhere because being 32 at the time I was realized I will never sitting at the desk as the secretary because it wasn't me an since I really started with organic farming. I think I believe. If you gonna go in the direction of something, if you want to do something do something related to that all times if you gonna do organic if you to do organic farming and then do something in relation even if right now you are growing stuff organic on your land do something relation to that. Doris and I started we had the land but we realised this is not gonna make money now we need to earn money now. We started selling the vegetables that we got from other people that are doing organic farming and started selling that and because the vegetables are the way they

are, that is the beauty of them, you buy vegetables from somebody, you give them cash. You take those vegetables you do your mark up. We decided to put the certain percentage mark up to this day we still got the same mark up because it's just happen to work. We have no background in finances or anything. We work out what I think it would be just with are initial really you know we invested so little money in the beginning because we didn't have money turn, so then we bought vegetables we work out what kind of mark could we make, we made our mark up, we sell the vegetables we took the money that we sell always and into this day still do the same ad is what estimate exactly how many vegetables we need in order to sell out. Because the minute you start carrying vegetables over, one of our biggest secret is that our vegetables are always fresh, you can hardly get fresher and the reason why we know exactly how many vegetables we need to sustain our market, how many people are gonna buy in this vegetables, so we sell out, we took the money that may be one bunch or two bunch of carrots left in our mark up is also included Dorris and I could take vegetables basically for free to feed our family that was very important and we took our money and then we took off our expenses very simple. How much the vegetables cost, that money went back into bank. This is my bank. This is how we started, and this is how is still is, we have our money. How much money do we pay for the vegetables that we took out again plus we always took a bit of retainer so the profit that was left, was always shared in the beginning. We strictly did a third goes to me, a third goes to Dorris and a third goes back to the business because we started with two farmers and we knew that we gonna go way beyond that, we were gonna need a whole lot more money. We didn't just start with a input of R50 and stick with the input of R50 because we were growing the business. So we always had to like put a little bit more cash to built up, and then we work out that and it was cut and dry took of the money for the car and how the market still cost, how much are the vegetables still cost extra for the business and split the profit 50/50. And from week to weeks we did better and better and in the meantime the farm was building itself up and now you'll see what Earth Mother Organic. Though you'll see now what is growing in to when you see this earthworm organic maybe it's a good idea to come may be on Friday I will ask Brett to bring you down on Friday. You will see we've got a market going ... Rehini, everybody is basically there on Friday

MM: What my departure time is with us when I leave

EM: When are you going?

MM: On Friday

EM: Because you could come in the morning

MM: Let me check my time. Otherwise you can come on a Tuesday. It will be a good time I only leave at 10.45.

EM: It will be fantastic because you can come and have breakfast at the shop. Okay. And then Rehini runs a vegetable market, starts at 10.00 so you still get a very good idea of what Earth Mother Organics has been built up to, it's really a travelling little business. Friday is a good day for you to come.

MM: Is there anything else you want to add to our conversation?

EM: No thanks.

MM: Many thanks to you. I learnt a lot from the conversation.

Interruption

MM: We can continue. I think this is an interesting discussion on learning and innovations.

EM: Definitely, some things like we say Permaculture that we definitely learn stuff out of the practicality of conventional agriculture and monoculture. There is reason why they do things the way they do things. So by blocking out of that side of things you are actually blocking a door to learning as well because our farm we try to make it in a productive farm where we take stuff to market and we earn money from it. I don't know there are romantic ways of stuff pulling out of one's head out of fruit trees. We tried it but didn't work for ourselves and for sake of our people work the land for us, needed more organised system and we certain realize that the reasons why they do this like monoculture system are for certainly for practical reason. One of them have been harvesting if you don't want to. One of our principles is not to stand in the bed, because by standing on the bed you compact the soil and again you need the machine to do it again like loosen which we don't do. By having a lots of plants from different places having proper infrastructure are paths and stuff that you were a stood in and right-sized beds. You can't sit on those beds compacting the soil you harvesting these crops because now that not ready. Three months later, you harvesting that crop because it's only ready then but in the meantime you gonna put in other crop empty bed and become logistical nightmare. Then I switched over to doing block planting, now what we are doing T crop but we doing in rows so it's more organised or intercrop three different crops that we know certain area. And then like the broccoli will protect the lettuces that we grow in the middle in between and sometimes the lettuce they mature but faster which made the beds and paths better but we did definitely learn lot of the organisation and practice by looking at this big agricultural. It's not like nothing to be learnt on that side and we a new way and all answers. There is something to be taken every single aspect of farming and whether it will be completely opposite notion from yours.

MM: Thanks very much.

EM: Okay, pleasure.

3.3.2 Interview with Thokozani (organic trainer) # SA4

MM: Can you start telling us what you do?

TH: Here is the Health Crest Centre for AIDS, I work as a community developer in terms of working with people affected and infected by HIV/AIDS. So what we do is that we've got nurses here who work with home-based carers who are based within the community. So those of based carers are people who are live in the community and who are able to identify patients and you find that having someone who is based within the community people can divulge the status much through easier than someone who is a stranger coming from outside. You'll find that why they normal do. When we had this home based carriers, we trained them, starting vegetable gardens and able to get them those skills what I did is, I normally monitor them in terms of seeing what they needed in the garden and also doing visits with them, and monitoring them on how to look after their gardens just to see if they are sustainable gardens. That is the whole idea to have the m to start gardens and able to sustain them. One of the main things we wanted to do is to make income generation for them, to generate income for them. But you'll find people they rather have eat it as food security than income generation so it's more food security than income generation.

MM: What kind of crops do they plant?

TH: We plant, I tried to incorporate a different vegetables so that gardens because we find that people they have a piece of land they only plants, maize, beans, madumbes, bhatatas (sweet potato) that is and half of the year they don't plants anything. So we try to introduce vegetables spinach, your beetroot, your cabbage, your b..., your turnips what this, and also got some potatoes. So it's a lot of different vegetables they are not used to, but they are willing to try out because even your Chinese cabbage, they love that, it's full of vitamins compare to your normal spinach. Yaa, we introduce that to them the whole process, holistic approach of the project. Home based care givers refer patients to the nurses, and the nurses come back to me once they find people that are bed-ridden, they can't and they lose their jobs and find that the person is the bread winners, so they can't go to work anymore, they lost the jobs they need something to help them get money or something which can help them to get some food, so they refer to me. I visit the patient once they strong enough to work in the garden and we find that also repeated have something to do and sit there think about your status it becomes more repeated to them to be able to have something to do during the day. So that's where I come in and teach them how to start a garden I assist them to start a garden and also work with the home based carers to find the whole based carers has about 10 patients so myself and home based care, we sit and we work with the patients and we supply them with vegetables seedlings and we teach them how to do prepare a seed bed and how to start a vegetable garden and afterwards it becomes bigger and bigger depending on how sustainable they able to look after the garden. So for the small garden we do, we give them vegetables seedlings, we give compost, we also help them to prepare their own compost so that they can keep on feeding the soil instead of feeding the plants. At the end of the day, it's actually passing on the skills to them and helping them to nature the garden.

MM: How do you teach them?

TH: Sometimes, what we normal do workshops we run workshops, we put together, they come here to the centre and then we do like a one day course. Something simple, basic because we find that most people are literate and we believe that the best way to teach them is to be hands on and practical so they tend to learn more when we visit them. So when I do the visits I concentrate in the garden and we demarcate the piece of land with them and we start working together with them to see to it to start the whole garden. So the main thing is actually being there with them, even we do run workshop for one day, the main thing is to visit them and seeing the progress and helping them out whenever they need some help.

MM: How long does it take before one is good at gardening?

TH: I think it depends on the passion they have because we find some people don't have patient and that project end up being unsustainable that's why I have to come and keep on motivating the person but you see this person is not really into a garden but just doing because he feels that like, he is pressurised of which they shouldn't be, but at the end of the day that person it takes much longer for them to read the report if I may say so. But for some people it's a like two growing seasons. It's like a year for them six months.

MM: How often do you visit them?

TH: Because I've got lots of people I have to visits them, for someone just starting I try to do regular visits, so I might go twice a week to them, may be skip one week do another week it depending on how the whole planting programme is. So those people that have just starts with regular visits but those people that I've been working quite some time is not as regular like other people, so you might find that in one month I might go twice in to that person

because it depends on what they actually need, because on really thing depend in the vegetables seedlings. That's one thing they really depend on, that's where I come from, we produce our own vegetables seedlings and we provide them with vegetables seedlings. They find it difficult to get hold of these vegetable seedlings, even its easy to get hold of seeds, which we might try to grow they find they don't germinate. They feel much better to get seedlings some of the seeds something that is really grow, so is more better chance of actually growing to the plants.

MM: What kind of difficulties have you faced in teaching gardening or organic farming?

TH: One thing, you mean from the people themselves?

MM: In terms of what do they find difficult to learn?

TH: Well one thing that is difficult actually when ploughing, growing some seeds that's one thing they find very difficult that's why we actually give them some seedlings they feel that keep on watering, watering and doesn't come out if I give them a seedling it's much easier to work with the seedlings. And another problem is not exactly in teaching but in production we find that the mole because we doing organic farming we find diseases and pests, if you use organic method they not as effective as your chemicals because if you put chemicals now, tomorrow is nothing do you see. So they want those kind of quick results but they understand that is the old method of doing things because they grew up doing that, but then when it comes to a result they take a very long time, so that is another thing I find as a problem, even when you have like aphids in cabbage. Some people said they don't want cabbage anymore they rather buy cabbage than to grow in the garden because of these pests. So then, I told them no, they can use organic remedies, they said no, no this thing takes too much time and I don't want to put poison that I might as well stick in these vegetables that grow well that I can manage and leave the cabbage so that is one of other problem they challenge for us the cabbage even the tomatoes depending on the season once they get this mildew fungus it's a problem they don't want tomatoes. So at the end of the day you find specific few vegetables that they are willing to grow. And another big problem is the water. Carrying water is very difficult, so you find they don't want to grow too many vegetables because the vegetables require water especially if it not rainy season, they require lots of water. So you'll find them we try to teach them methods of mulching everything like that but then people want you to always to be there to remind them. You might teach the person today, must mulch do this and that. When you go there the person hasn't done this and then you said do it, you have to come back again to remind them, what they have to do it. The problem is that some people don't do the things you teach them at the appointed time, they want to keep on reminding them. Plus these old women, you must keep on reminding them, reminding them until they get it right and able to do it by themselves.

MM: Are there any tools or equipment that you give them as the people that are sickly?

TH: Yaa, we do provide your hand hoe.

MM: Is there any different from the standard that was?

TH: No, there is no different because we try to give of limited resources we can't give them more but we can advise them if they want to make watering can. Some people say, they want watering can and I said there is no need to buy watering can. Go get a can and put holes and put water. We try to teach them those kinds of methods not always to buy watering can

because really you find there is lot of tins and stuff that are lying around so they might as well use that. And you find people also want fence, we do provide fence but is not always the case it depends on how much the person definitely need this because if the person leave in the area where is no forestry, they can't get hold of tins and other stuff like that it becomes difficult for them to actually put the fence around, so we try to help to put up the fence but also it depends if we got funds for that but we always encourage them to either use a nets because sometimes we give them old nets we had for our nursery so they can put nets around or they can just use anything rubble that you can get from your broken trees old concrete or something to put around but whenever we get funds we will try to buy fence and give to them, we can't give everyone that is the thing.

MM: What do you see as the main strengths and weaknesses of organic farming?

TH: Organic farming.

MM: What do you call the kind of farming that you promote?

TH: Yaa, I will say it is organic, but in terms of strengths, people will see as strength not for me or for people.

MM: For you.

For me, what I see as the strength is the nutrition side of this especial working with the people who are HIV positive and stuff like that. You'll find nutrition part of it is what really the main factor. But in terms of the weaknesses of it takes a very long time to grow and then you find it is not as big as normal one it becomes very small and people think this is gonna grow, is gonna grow but I say no, is already ripe it they can eat it. You'll find it is very slow process. Agriculture is the business is a slow process to get food but when it comes organic it even slower you see, that is another thing but when it comes to another method of organic farming like your mulching and other stuff that help to produce water. Water is very scarce so in terms of reducing other resources by using certain resources I see that as strength because it also helps people to know to be friendly in the environment because you can't just abuse things and then at the end of the day you say I've got no water. So if you take good care of the water everything will be okay, Yaa

MM: If you have to score the economic value and ecological value and social value of organic farming out of 10. How do you score each of them?

TH: In terms of social out of 10, I give 7 and environment, I give 10 out of 10 and then in terms of economic for a person who is in the rural area doing organic farming wants to do as a business is very difficult but I give 3.

MM: Can you may be just I think some of the stuff you'll repeat it just find the scoring and explain why are scoring?

TH: In terms of social, you looking at the whole farming practice, socially it's good for the person because I am looking at from HIV perspective. Socially its good because is something you can do which really doesn't give you a bit of therapy you know is also for someone who has been bed-ridden for a long time, it really brings back that strength and also seeing your plants grow and actually a harvesting at the of the day, the whole process. I mean it's like magic from something that is small and to grow to something that can eat, for me it's amazing. I think in terms of that, that is why I give 7 and in terms of economic,

economically people want food, they grow food for themselves to eat, even they might see it as a business but they don't see like something generates a lot of income. For them and even the people have a biggest land to community gardens they also struggle to sell the products you know, because they might go through those informal market, when they get grants and stuff like that it's not that much income even although its little bit of income but it does play that much of the role, so that is why I score 3. In terms of the environment using chemicals it damages the environment it damages the soil and intend to abuse your resources if you use other agriculture practices. So in terms of your organic farming all your resources you use what you've got and you know and you don't have to go and buy things to supplement you don't have to go and buy. You can actually get it from the environment itself. The environment invites for organic farming so we find that as I was saving water, you can actually reduce evaporation by using mulch and mulch is something that you get from the environment you know. Even with your soil, you not feeding the plant like when we using the chemicals, you feeding your soil by putting your organic material you know enhancing the living organism which are in the soil like your earthworm not destroy earthworm you making more earthworm so that the soil can be very good rich in nutrients and also aerated so. In terms of environment I give 10 out of 10.

MM: So as the individual how did you learn about organic farming or other agriculture in general?

TH: For me it started when I was in grade 10. When I was doing biology and do biology its more along the plant production and stuff like that unlike and I got very interested in Biology its where I started getting in interesting thing farming not only in plants but also in animals, but once I matriculated I went and study at the college of agriculture where I did my diploma in agricultural science. So from there onwards I was taken as the intern in the department of agriculture and I was in the extension officer, so working as an extension officer you tend to work with people and you liaise with people and you try to help the mulch as much as you can in terms of studying the gardens. The department of agriculture they had to work with people that they have one hectare and above unlike here, here is [interruption].

MM: You suppose to work with people had one hectare and above.

TH: Yaa, it didn't cater for someone who has a small garden, so and then the post was advertised in the paper and then I applied, I've got the job and what make me want to apply specially is how it all works it's not about helping just people you know even if we do with the people that are affected by HIV AIDS if the neighbour says I wanted to start a garden yaa, come you are not to have one hectare , you can have 10 000 00 or you can have a square metre, that's fine you can have a bucket, it's fine I help you out you bring your broken bucket, your washing whatever you put compost you put soil, mix it up and I bring seedlings and then we start a garden. It's fine you know you don't have I help you out.

MM: At college, did you learn organic farming as well?

TH: No, I didn't learn organic farming but I did do some kind of introduction in two weeks but not exactly we didn't do as a subject or as a course. So I actually started learning about organic farming when I got here at Crest Health Centre. There is a guy by name of Raymond Landcare foundation so he was the one who was running some courses, and they send me there to do the course so that's where I got organic.

MM: How long were the courses and how many did you attend?

TH: I first attended the two weeks course and then after that I attended facilitator course, organic facilitator course which ran for about nine months if I am not mistaken.

MM: Nine months

TH: It was NQF Level 5 qualification, I did that so, that was only organic farming courses that I have done.

MM: What is your feeling on it for your training?

TH: I still want to know more things about organic farming and when I am not sure about things I tend to refer some of our people some of our patient to Raymond so he does give them some skills and I also try to give them some skills and help them out. But I feel that there is a lot to be done in terms of organic farming and I think we must not give up you know because at the end of the day everybody is going in that route but the pace, we are going with the slow pace we going in the right direction.

MM: Did you find any difficulties in accepting some of the things that are taught organic farming?

TH: Not exactly because when I went to study at organic farming I ready had my mind set in terms of saying the other agricultural practices they are not doing what they suppose to do they are not environmental friendly even though they high returns in terms of economically. But even in health you know I mean, some people say it doesn't been improving yet because you find the genetically modified, they said is not improving yet they cause some disease whatever because they been there for such a short term you know so I mean at the end of the day, there is some harm. So when I went to organic farm I really knew that it is not the right thing to go and buy so in terms of business I am still sceptical about it. Organic farming I think never meant to be a business, but it was meant to be skilled every individual has so that every individual can have garden at home and fresh food vegetables

MM: Are there any local practices or culture or beliefs that people have that make them like some of the techniques or that using organic farming?

TH: I haven't come across with any because organic farming they tend to see as an old model of doing things but we had a new twist if I may say so but I haven't come across with anything like that.

MM: Is there any history of farming in your family? What did you decide to study agriculture?

TH: For me it was my father he always wanted to be a farmer and always want to go to agriculture but then, he couldn't and so ended up.

MM: Why he couldn't?

TH: I don't know why he couldn't but ended up being a teacher. But I always had interesting in plants and animals things like that I think that what drew me to agriculture rather than the influence maybe of my parents. Because in my family no one is agriculture is only myself but we myself and my mother we both to health and to HIV AIDS community development cause she runs a Youth Centre which is also is funded by the department of Health and she does HIV/AIDS in education and I am also working in HIV/AIDS.

MM: Thanks very much. Is there anything else you like to say about organic farming, how you learnt about it, how you teach it and how is practised

TH: Organic farming it's a good thing it's just that we are still have a long way to go in terms of making more chemically rather for the rural areas the same people, that need the job they the land and they need the money for those people it's the very slow process. But then even in organic farming what I find out is the agents that certify organic farming in SA we don't have that many and find that the people influence our certification as the European. Now people you know even the whole process is so straight for someone who is not as intellectual as in the rural is not clever you can't read or write it becomes you know a challenge for them you know so with that regard it's really sad me we don't have our own accrediting agents to grade our farms because if we did we can start of may be slowly, slowly just integrating the whole thing cause now what is happening try people come from what is this agency called Netherlands, Australia whatever and come from Europe, something like that. All these policies come here they want the products they are very strict. I mean we are still a new country and we need to integrate things slowly but then yaa, there is a future definitely for organic farming but it's a very slow process.

MM: Thank you very much for your time and the ideas. Do you have a business card?

TH: Yes, No

Q Can I have your full name?

TH: Yes let me write it down.

3.3.3 Interview with Steve Organic Farmer # SA5

MM: What motivated you to get into agriculture?

St: Because I was interested in food growing from a health point of view. So I was into healthy food when I started 25 years ago.

MM: Twenty five years ago?

St: Yaa, yaa, 25 years ago, just started on a very small scale. It didn't work out but anyway quite a taste of what it was all about. I got some commercial farming experience with another big farm and then it turned out that organic farming was a completely different kind of set up. And then here, to be quite honest with you, it has never really been sustainable in the sense of being able to pay for a lifestyle that a western person requires. So the scale was obviously too small. So how I managed to survive doing retailing myself, I used to have my own retail outlet. Most organic grower used that as an attraction and I got produce from other farmers. And that is how I managed to keep paying my bond and send my kids to school and all that kind of a thing, otherwise at the scale I was farming, I don't know, it certainly wasn't farming alone but with added value retailing. So it has never been good for long but we are getting more efficient now and there. I would say the farming pays for itself alone. The overheads I have here. I have just had cables stolen worth R5,000 and that was two months ago. This last full moon they broke in again and stole all the copper wire. So these are the kinds of things that you are faced with and then if you doing this kind of business here.

MM: How big is your farm?

St: We are rotating on about 7 hectares of land.

MM: Okay for how long have been working on that size?

St: Well, pretty well around five or six years and we need to grow a lot more to supply supermarkets as well as retailing ourselves. On a rotation basis because there is only about three or four hectares planted at any time.

MM: Is it production throughout the year or are there certain times when there is none?

St: Generally, yes. Rotation allows us to plant certain crops in the heat but our best crops are winter crops. They seem to do well for us.

MM: How would you say you learnt organic farming? Who taught you? How did you learn? And what did you learn your own?

St: It was just the passion. It was the burning desire to farm organically come what may, if I needed to make another plan to pay for the cost of farming, I did it. So it was just a burning passion to farm. I did not make it at the beginning but the passion to farm was ever there. And it probably gave me an edge ever since.

MM: Who taught you?

St: Well I learnt by speaking to other farmers and by making mistakes.

MM: What are some of the mistakes that you made and corrected?

St: Well it is very critical to know what varieties of crops to plant during different times of the year. So you know certain varieties of carrots will do well here, others not. So those are the kinds of things that are very, very important, basically what crops will pick up problems during different times of the year.

BM: That used to form the backbone of agriculture, that selection of species, of varieties.

St: Yes, it always has. And some farmers have come complaining about their carrots not doing well. I learnt that one of the problems was that the nature of the soil there was compacted and hard. And lettuce did not do well. So that is how I started working on improving the soil.

MM: And what sort of things did you learn from other farmers?

St: Well, I would ask them what crops are you planting now and what problems are you facing.

BM: You are still learning from the experience of other people?

St: Yaa. Certainly a farmer who would like to farm in a particular area should try and speak to as many commercial farmers in the area and see what they are growing there. See what ideas they have.

MM: Would you say you have taught other farmers as well apart from teaching yourself?

St: I have got somebody that has been working for me all this time and he has got land now. I am not sure he would say I taught him. He would probably say farming is in his veins. He is also patient about the soil. He has always had a piece of land. He has learnt a lot about

organic growing. He always does it the right way using compost, staying away from scab. He grows potatoes.

MM: When you say it is in the veins what do you mean? Do you mean that some people are born farmers or are brought up in farming families or something else, what do you mean?

St: Saying that people are born farmers is going into a different realm but everybody, when they are born, they have a calling [all laugh] it is the only way I can describe it is a kind of a calling. Many commercial farmers now are doing it just purely for the money, it's like doctors are doing, practising medicine for the money. But some of us will do it no matter what happens. So there is not many but I think all your guys farmers. Those guys are genuine farmers. It is a different mentality as well [all laugh].

MM: Go on, what mentality?

St: Well the way they used to make labourers work – the labour intensive farming. It's like these area where you collect aloes.

BM: (Interruption – he leaves and BM explains about Steve growing aloe and that he did it through observing what grows well)

MM: What difficulties have you encountered as an organic farmers?

St: Insects, frost, theft, cable thefts, red ants, cutworms [all laugh] breakdowns. Yaa mainly you grow anything for too long, you pick a problem so you can't do that for very long. In Natal, this area is not particularly a good growing area for vegetables in summer, with the high humidity, it helps all these leaf diseases to spread. So it's not a very easy climate to work in. And half of the year it is dry. It's much easier to farm in winter. Cutworm has been one of the problems. How we deal with it is we work the land and we leave it for about six weeks. That way the cut worm has nothing to feed on. Weeds are another problem because weeds determine how much you can grow organically. Because if you are using organic manure. Now if you are competing with conventional farmers, who just spray those weeds. We discovered potatoes this year. They do pretty well. It's quite nice [all laugh].

BM: They are a good cover crop.

St: We lift them with a potato ridge lifter and from then it is by hand. We also plant them by hand. That is a new development. That crop helps you turn the soil.

BM: They are great for mixing the soil. Potatoes create a very good texture.

MM: Are there any other difficulties you have faced or are facing?

St: Just rising costs, rising costs.

MM: Don't you push up your prices go as well?

St: Not enough, ask these guys [all laugh].

MM: Do you use a lot of diesel, a lot of fuel on your farm?

St: Just the nature of this slope, doing all the ground work and cultivating and also the nature of this property is quite steep and to take a trailer up and down the land – that way we use

quite a bit but luckily we are fairly close to markets. So that is quite important on cutting our fuel expenses.

MM: Brett was talking about you leaving some of the fields fallow. How do you do that and why?

St: Because I don't plant cover crop as such. It is just like a recommendation that you plant cover crops but there is always a fair bank of weeds in the fields. Instead of a cover crop I just let weeds do it. It is easy. And that rests the soil because I don't have a great variety of vegetables that I can use as part of the rotation.

MM: How long do you rest the land?

St: Well it depends on when the next crop is due but up to a year. There is always something resting you know.

MM: What advice would you give to people who would like to go into organic farming?

St: My opinion is where they are coming from, if they really wanna do it, they need to have a bit of farming background. They need to be keen to do it. So those are the kinds of prerequisites. It's not like there is nothing to do in farming. For those people who are really dedicated they will have good chances. Good soil, the land should not be too steep, good water supply depending on what you want to grow. Be close to the markets depending on the nature of your market, depends also on what scale you want to pitch it on. Specific questions would arise from a specific candidate I should imagine.

MM: Do you have female workers on your staff?

St: Yaa, yaa. Most of them are women.

MM: Why mostly women?

St: I don't know, it seems to be the custom in this part of the world – vegetable farms, vegetable farms. And then the guys fix the fences and drive the tractors.

MM: What percentage of the workforce are women?

St: Two thirds.

MM: So who would you say does the more difficult work?

St: It is difficult to answer which is more difficult or easier. Both do easy and difficult work. Men wouldn't like to wash carrots [all laugh]. Similarly if you asked women to dig holes, they would probably object. So it depends. Women don't seem to mind washing carrots at all.

MM: What kind of tools do you use on the farm?

St: Hoes for digging and garden forks which we use for lifting carrots for example and rakes, we always rake up areas where we have planted seed by hand. And then the tractor, the cultivator and the disk harrow for bringing up the subsoil. We also have a mower.

MM: If you were to compare a small-scale farmer and a commercial farmer in organic agriculture, what would you say are the most important differences?

St: A small-scale farmer would probably negotiate a friendly kind of home-based market whereas a commercial organic farmer would negotiate with supermarkets. It is a whole different ball game. He has got to be involved in the core chain. And the produce might even need to be shipped off sometimes back to the same port. They have opportunities to export if they get their act together. The scary thing that is happening is now is that commercial farmers are going to seize the opportunities. And guys like me, sustainable small-scale farmers, they are just going gonna get left behind because these guys are already developing ways of biologically growing without using pesticides. There is a farm, a massive, it's huge, it's about 400 hectares of intensive vegetables. This guy is about 95 % organic. So what's gonna happen and there are some big guys like him as well, who are already on the export bandwagon and all that and their costs are so much lower than ours. They are gonna get their act together soon. I don't know there is a big difference between the old school of organic pioneers I think and the new school. Yaa I don't know, it will be interesting to see. That is something to watch out for.

BM: What I think is that small-scale farming in Permaculture has much more social benefits.

St: I have chosen that option to market. I have been approached by a supermarket and I came close to signing but I haven't. I am sticking with the traditional, home-based and friendly outlets.

MM: Why have you decided to stick to the traditional outlets of yours?

St: Well, to cut out the middleman, to cut out the middleman. These guys have got offices in posh places. And we are paying for that you know. So we cut all of that out and also give the consumer genuine fresh produce through a farmer's market.

BM: Yes the stuff that we sell to the consumers basically reaches them within a day and it is a logistic impossibility for a large-scale farmer to do the same. The nutrition is kept in fresh food, but there is also the issue of high vitality that is retained if you sell the food fresh. It is as important as the nutrition in the food. It has got the life essence.

MM: Are you a member of any farming group?

St: No, I used to belong to one organic farming society.

MM: Do you have any manuals or guides that you refer to?

St: I don't [he laughs] honestly I don't. We wake up in the morning. We know what to do [all laugh]. If it is raining, we can't plough and we don't water.

MM: And how do you keep, how do you preserve, how do you pass on the knowledge and experience that you are building over the years?

St: I tell my staff and there are some youngsters. You know the guy next door who got a farm recently. So yaa those guys are learning organic principles as well but there is no programme.

BM: But I think the reality of it is also you help me a low that you have been, when I ask, you are willing to tell me. That is how I have learnt what I am doing.

MM: What kinds of questions have been brought to you by other farmers?

St: Well, how to grow carrots. We grow carrots here and they do very well. So it is quite simple, the bed must be well prepared and they your watering because if you water with a watering can you are only watering one inch deep and for the carrot, once it has germinated, the ground must be wet – keep moist until the carrot is looking strong. And then let it dry depending on the weather and the time of the year. Whereas if you don't water correctly and the carrot looks for water, you don't get a good crop – yaa that is the most important thing with carrots. Also getting the right seed variety for the area.

MM: Where did you learn that from?

St: From practice. It became obvious to me that you needed water and good drainage.

BM: The vegetables also tell you, like at our farm. You learn by making the correct observation. The plants explain what they like and what they don't.

St: On a hot day it is quite clear they need water [all laugh].

MM: And in your family, is there anyone who is taking after you?

St: In my family certainly no but it is the guys who are working with me – you know some youngster. Well if you grow up on a farm, you can learn it but these guys who are just looking for a diploma it must be costing the government a lot of money. It is insane, absolutely insane.

MM: If you were government and choosing people to do diploma courses in agriculture, or degrees, how would you choose them?

St: In my farming I meet people who ask me questions and by the nature of the questions they ask, I can tell if they are strong in agriculture – the interest, the connection. I can tell that from the dialogue. Within that dialogue I can see there is a connection. That is a tricky one because people get diplomas in any field for the sake of a diploma [this sounds like a possible area of research to see of those who have got agricultural diplomas, who is still in the field and to see where they came from – especially in countries where structural issues are not inhibiting].

BM: What do you think would be a successful strategy for identifying people to train to become farmers?

St: Upbringing is an important factor, people who know how it is to farm. Coming from a farming background is important.

MM: I don't know if there is something else you would like to say about farmers, other farmers in terms of learning from them and teaching them.

St: No nothing at the moment. Probably when you walk out of the door I will think about something.

MM: Can we have some pictures taken? We would also like to take a tour of your farm.

St: Yes of course.

MM: Thanks very much for the time and ideas. Could you rank organic farming in terms of the social, the economic and ecological dimensions?

St: Regarding what?

MM: Say, the economic, what would you score out of 10?

St: Well, it is labour intensive, so I would score it highly. Farming of the future is farming without pesticides.

MM: And the scores, how much would you give?

St: I would give each, 10 out of 10 otherwise I wouldn't be doing it.

MM: Okay, thanks very much.

3.4 SAMPLE OF ANALYSIS OF INTERVIEWS

3.4.1 Analysis of Interview with EM (#SA1)

Interview Code: #SA1	
Aspect of research	Evidence from interview
Object	Marketing organic produce for a profit Diversity of talent, of crops, of enterprises Erosion Sustainability or lack of it Dependence on external resources (limiting it)
Tools (and learning processes)	Permaculture courses, inherited land, financial resources to invest in buying and selling organic vegetables, water harvesting technology, labour By asking questions related to the challenges you are facing. By visiting places where things are working and asking why this is working. —Not booklearn't
Rules	Re-classification of the former agricultural area to an urban area, which raised rates and electricity bills
Community	Extended family, Organic farmers; farm workers (gardeners, harvesters), marketers; organic shop owner and other suppliers; municipality; the unemployed; commercial farmers; consumers; cattle keepers (from where manure is obtained). Cordial relations through observing local practices such as greeting people in the area and knowing them as well as allowing them access to some medicinal plants found on their land.
Division of labour position and power relations	Investing in business, growing vegetables, collecting and buying vegetables, pricing and marketing The entrepreneur has more power than the employees. Organic suppliers seem to have bargaining power for prices of their produce. Hands on people do the practical work in the garden. The sangoma concentrates on the herbal stuff. The people-person does the selling and marketing work; the one who pays attention to detail plants seeds and looks after seedlings; the conceptual do the planning and organising. Here there is evidence that talent and knowledge are

	distributed.
Subjects	Organic producers, Organic marketers
Contradictions and limitations	<p>Being taught by people who were at the beginning of their careers and therefore novices – Subjects, level 1.</p> <p>Negative attitudes of male Zulu farm workers to female instruction. They feel more comfortable being told what to do by another man, not a woman – Subject, Level 1.</p> <p>Lack of seed drying facilities – Tools, level 1.</p> <p>Planting flowers for beauty and not crops for food – Objects, Level 1.</p> <p>The Permaculture course attended was not completed because of theft – Community-Object, Level 2.</p> <p>Use of Permaculture principles in organic farming – Tool producing activity system, Level 4.</p>
Habitus and identity	<p>Family had garden from as long as she could remember. Vegetables had gardens. Friends' mother whom she visited regularly had a garden too (in a sugar cane plantation farm).</p> <p>Being practical minded helped her learn and implement PC and organic farming.</p> <p>Experience in working in a shop as a retailer and having travelled widely inspired her to think of selling organic produce from farmers in and around her place.</p>
Time-space considerations	<p>Seasonality of vegetable production and therefore of income generation, summer problematic</p> <p>It took years for them to build the production levels at their farm during which time they relied on produce from more established organic farms to buy and then sell for a profit.</p> <p>—Would have to say a biggest obstacle would be trying to convert organic farming into a financial sustainable project into short time. We also at the beginning thought we will do like quick, quick but it wasn't going to work. What we found working was networking with other farmers... We have been building up our own farm all this time we've been doing a lot of soil feeding and all of that at the beginning we did try quickly to make a profit overnight, quickly putting in crops and harvesting but we encountered many difficulties with that because our farm infrastructure wasn't ready. Our farm labourers, everybody had to be taught the way our system works, but it didn't happen overnight. Our own learning on our own particular farm ... took much more time, than we estimated.”</p> <p>—Would say networking is very important and time, time, time, give it time.”</p>
Position and relations	<p>Network of farmers who wanted to sell their produce and concentrate on farming, while she needed constant supply of organic vegetables to the market.</p> <p>Sharing vegetable seed with other farmers, especially the less common species and varieties.</p> <p>Woman doing the lighter work, husband the more energy demanding</p>

Motivation	Earn a living The passion to farm
Agency	Engaging with different structures in Durban urban in order to get a place to sell produce. Accessing international supplies of vegetables, going through the systems and structures.
Innovations	Dealt with seasonal vegetable shortages by importing from Europe during periods of scarcity in South Africa in order to provide all-year round vegetables to consumers. Reduced the number of farmers from whom to buy vegetables in order to cut on costs (down to 10) Holding three market days for selling vegetables in designated areas Inclusion of a beauty, especially of lawn around the house in the design of the home, which is not generally encouraged in PC but important to her. Block planting or planting crops in rows in order to facilitate easy of harvesting rather than mixing them in the intercropping [the same innovation was made in the MFS in Lesotho]
Causal mechanisms	Personal drive for success Passion for organic production which is responsible Availability of the land resource Family knowledge about organic farming
Scores of ecological, economic and social value (out of 10)	Economics, Year 1 = 1 to 2/10 but year 15 or 20 = 9 to 10/10 Ecological = 9/10 Social = 10/10 because it addresses poverty and when there is enough safe food; people can direct their energies towards other pursuits in life such as academic work.

3.4.2 Analysis of contradictions in the Isidore case study

During the course of the research there was a point at which I concluded that tertiary and quaternary contradictions were the same in that they constituted contradictions between a central activity system and those that it interacts with because I had not fully grasped the concept of an advanced activity system, which essentially is concerned with the same activity system but in an improved state. I therefore decided to have three orders of contradictions with the first and second order contradictions being the same as the primary and secondary contradictions.

Order of contradiction	Descriptions of contradictions in the South African Case Study on Organic Farming
First Order – Within elements	Contradictions in tools <ul style="list-style-type: none"> Labour intensiveness: –We always pull out the weeds”.

	<ul style="list-style-type: none"> • Non-production and limited availability of appropriate hand-powered tools in South Africa, e.g. chaff cutter, scythe. Only in second hand and antique shops. But —You can buy a mulcher at R 22,000 that does the same job at 50 times the speed but requires petrol, requires maintenance, requires a mechanic; you know and for a small farmer the 22,000 won't get recuperated before the machine is”. • Low energy level among the farmers who are either old, or sick or have been sick doing an agricultural practice that is energy-demanding (e.g. fetching water from the river) • Farmer's low abilities to develop nurseries and produce seedlings for themselves • Water: —We do have water, the problem is when the water pipes are broken, and so we do not have water. Last month we didn't have water for the whole month, just because the pipes were not working and when we have not paid the water...” • Lack of flowers to attract birds that eat problem insects. • Lack of water in the dry season, winter. • Ineffective organic pesticides. • Using DDT and removing swales in a group vegetable garden. • People not having the sources for mulch to put in their garden so they cannot out into practice what they are taught, so they keep using inorganic fertilizers • Some traditional beliefs. • Training of farmers takes two to three days, which is generally too short. • Language, trainers not being fluent in the local language, Zulu. • (However, there is a general and wrong perception in response to the question of for how long farmers learn. The subsequent and formal learning time is not included). • People with no background in agriculture being assigned mentorship roles in agricultural projects. • Ambivalent messages: —Until there are agricultural NGOs actually actively promoting ecological agriculture, what is a crazy white like me going to say to 30 old <i>gogos</i> [grandmothers] down in Mboweni when they see the NGO coming everyday with its version of agriculture? What credibility do I have there?” • Spreading resources for learning/training too thinly in order to cover as many people as possible. • Burning grass which is a source of mulch and organic manure. • Lack of seed drying facilities • Inability of farmers to raise their own vegetables and having to buy seedlings from suppliers. • Lack of good accessible cases of organic farming that can interest people in it • Three days allocated for learning farming too little. • There is a general and wrong perception in response to the question of for how long farmers learn. The subsequent and formal learning time is not included. • Loss of seed diversity over the last 100 years • Inability of farmers to raise their own vegetables and having to buy seedlings from suppliers. • Lack of animal manure: —In fact, it was not difficult only we did not have enough facilities to improve the soil as he has been talking about mulching and getting to farmers with horses. It's only that.”
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Contradictions in rules

- Insecurity of land tenure.
- Costs of registering as an organic producer are too high and likely to continue to exclude small-scale farmers.
- The process of certifying organic produce is complicated for the ordinary farmer and therefore discouraging.
- Strict regulations for organic produce.
- Inefficiency and loss of institutional memory in the Municipality which undermines implementation of environmental programmes. —And then you hear the budget has been allocated but they were not spent. So there has been a kind of collapse in municipal institutional memory. There is no institutional memory anymore. No one knows how to issue a letter of appointment, how to take a project tender and if not a tender how to take proposals and push it through council approval system”.
- Increasing rates for water in urban and peri-urban areas
- Organic produce is too expensive for ordinary consumers so they end up buying the conventionally grown stuff which is cheaper.
- Poor selection processes (policy) where the councillor chooses cronies and pretty girls to get free lunches and so on, instead of sending serious farmers for organic training
- Poor sandy soils that take years to build
- Recurrent droughts
- Frost and recurring droughts
- —Time to practise. Without implementing, without starting, without doing, you learn very little.”
- Some traditional beliefs

Contradictions in subjects

- Lack of follow-up as evidenced by the shock of the trainer when he realised that people had resorted to conventional farming practices.
- Being taught by people who were at the beginning of their careers and therefore novices.
- Negative attitudes of male Zulu farm workers to female instruction. They feel more comfortable being told what to do by another man, not a woman.
- Only the old people are interested in agriculture.
- Those trained in organic farming and Permaculture will be too old to do agriculture in the next five years.

Contradictions in objects

- Clash between time needed to spend at the training centre and offering training there and time to do outreach programmes with farmers.
- Whether to invest in train the trainer or work directly with farmers.
- Planting flowers for beauty around the house or food crops for food security.
- Invest in train the trainer or work directly with farmers.

Contradictions in community

- Lack of interest to farm —In 2004, yes we started 2004, we were many. We were group of 30. So we continued with some dropping on the way, we are now 12”.
- Stigmatisation of agriculture
- High illiteracy of the trainees/farmers.
- —Think they are lazy because even me our neighbours have got nothing here

	<p>but they see every time we farming here.”</p> <p>Contradictions in division of labour None</p>
<p>Second Order – Between Elements</p>	<ul style="list-style-type: none"> • Fear of snakes – Subject-Tool. • Organic farming at a small-scale cannot generate income for meeting some of the basic family needs such as paying school fees – Subject-Object. • Some guys who get training in agriculture just to get a Diploma, a qualification – Subject-Object. • Workshop participants driven by the desire for free-lunch and certificates rather than interest in agriculture; traced to wrong selection processes and criteria – Subject-object. • Regular theft of cables on the farm – Subject-Community. • Not getting support for sustainable agriculture project even when the Municipality has the resources and does not spend them – Community-Subject. • Theft of agricultural produce from the old lady which prompted her to grow rhubarb, a crop people do not steal (because they do not eat it). Monkeys, which are also a problem in the area, do not eat rhubarb – Subject-Community. • —have got one cow left, all the others were stolen”. She had twenty at one point and she lost over ten from theft – Subject-Community. • The Permaculture course attended was not completed because of theft – Community-Subject. • Cannot sustain a western lifestyle – Community-Object. • The need to fence off gardens so that livestock does not destroy crops in winter – Community-Rules. • Organic producers, especially those on large scale are practising mono-cropping, which goes against the idea of diversity – Tool-Object. • Farmer selection process of finding the destitute – Community-Tools. • Tall poppy syndrome where new and emerging farmers are sabotaged and undermined because jealousy and unwillingness to accept that the ordinary can emerge and become better (but swinging the pendulum too far could lead to the —Matthew effect”) – Community-Subject. • Current consumer power, consumer preferences, buying where they buy – Community-Object. • —...but they did not do nothing, when I ask them why they did not doing farming, they say no, we don’t like to farming because to farming it is not helping us they said like that.” – Community-Object. • People in the neighbourhood stole from his garden when he was away and when only his wife was around. —I think they was finding a chance to steal our vegetables because there were seen that the Rasta is not here, that is why they steal because when I am here they not steal, it means they respect me(both laughed)” – Subject-Community. • People’s concept of development being associated with buying from the shops rather than producing on one’s own: “... that story, of the black woman that got a successful job and was taking food back to the family and the family stopped growing vegetables. That needs to be told. That story was so powerful” – Community-Object. • The problem is that the youth of today have turned their back on the farm because of the negative connotations associated with farming before. Nobody or very few people, especially among the African culture of SA see farming

	<p>as a mental sport – Community-Object.</p> <ul style="list-style-type: none"> • Attitude to organic farming as backward. —“I was the first organic farmer in Natal. And other farmers they laughed at me and I was doing organic” – Community-Tool. • Excessive use of water in the group garden – Subject-Tool. • Only a small percentage of people who attend organic and Permaculture training are genuinely interested. Two out of 30 is considered good. Part of the reason for this is the improper selection process – Tools-Community. • Training too many people for too short a time so that the budget covers more numbers even if the depth is not there – Tool-Object. • Livestock management in cultural areas, left to roam freely in winter – Tools-Rules.
<p>Third Order – Between Activity Systems (elements of)</p>	<ul style="list-style-type: none"> • Extension workers not being taught enough about organic farming in mainstream agricultural colleges – Tool producing. • The increasing number of orphans because of HIV/AIDS —“You saw the school down there, well at the school down there, there is a home full of children who are orphaned. Their families died of AIDS. They were brought in by neighbours or by family but there is a hundred of them in that school alone and any surplus food that we grow from that side, we push down into the school. – Subject and tool producing. • Use of Permaculture principles in organic farming – Tool producing. • Peak oil, leading to the need for alternative fuel, agro-fuel – Tool producing. • How to simplify complex material into a form that farmers can relate with and learn from – Tools producing. • International propaganda against organic agriculture – Tool producing. • How to teach that which cannot be seen, such as soil ecology, getting the concept across – Tool producing. • Misinformation by agro-companies – Tool producing. • Emergence and promotion of Genetically Modified Organisms – Tool producing. • Tension between agriculture and other activities in society such as politics. —“I say agrarian consciousness it simply means that agriculture resumes its place in our culture as a matter of, not primary but as important as economy, as important as politics” – Object producing. • —“Unfortunately the vision of organic farming over the last 12 years has been getting smaller and smaller. It started as a major thing. Everybody should get into it. And I have watched it shrink not in essence, not in need, not in demand but in the realisation of how far back we have got to go and how far behind we are.” – Object producing. • Fragmentation of connected activities through departmentalisation (compartmentalisation) – Tool and rule producing. • No government support for the marketing of farmer produce (Isidore Organic does this for the community). Also thinks that government should set up factories nearby in order to stimulate agricultural production. – Rule producing. • Certification of organic produce and the standards are developed in Europe – Rule producing. • Smallholder farmer has limited access to export – Rule producing. • Spent a lot of time in 2007 attending to his sick son who eventually passed away and during the period of illness, he could not work the garden – Division of labour producing. • Health (HIV/AIDS) – Subject/division of labour producing).

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| | <ul style="list-style-type: none">• Fear and insecurity people do not want to grow things on their plots in town because criminals might hide there – Community producing. |
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3.5 REPORT ON ISIDORE EXPLORATORY PHASE

1. INTRODUCTION

1.1 Brief background to the study

This is a report on a case study that I conducted **with** research participants in South Africa. The case study is based on the Organic Farming (OF), which is a form of sustainable agriculture practised in South Africa and in many parts of the world for local food consumption as well as for selling at premium prices. The study is based on ten interviews that I conducted with Organic Farming trainers and farmers in the Durban area of KwaZulu-Natal Province of South Africa. The research participants were connected to the Isidore Organic Farm and Mother Earth Organic in some way: either supplying produce for sale, providing training services, working in partnership with them or receiving organic training services from them. The interviews took place in the last week of September 2008.

1.2 Definition and explanation of organic farming

Organic farming is concerned with the production of food in ways that are environmentally friendly, economically sound and socially equitable. The most comprehensive definition comes from the International Federation for Organic Agriculture Movements (IFOAM) and is captured below:

Organic farming includes all agricultural systems that promote environmentally, socially and economically sound production of food and fibre. Recycling nutrients and strengthening natural processes helps maintain soil fertility and ensure successful production. By respecting the natural capacity of plants, animals and the landscape, it aims to optimise quality in all aspects of agriculture and the environment. Organic agriculture dramatically reduces external inputs by *refraining* from the use of synthetic fertilizers and pesticides, Genetically Modified Organisms and pharmaceuticals. Pests and diseases are controlled with naturally occurring means and substances according to both traditional as well as modern scientific knowledge, increasing both agricultural yields and disease resistance. Organic agriculture adheres to globally accepted principles, which are implemented within local socio-economic, climate and cultural settings. As a logical consequence, IFOAM stresses and supports the development of self-supporting systems on local and regional levels (IFOAM, 2005).

Organic agriculture is based on four principles which are:

- a. The principle of health;
- b. The principle of ecology;
- c. The principle of fairness; and
- d. The principle of care.

The **principle of health** is directed at sustaining and enhancing the health of soil, plant, animals, people and the planet as one indivisible whole. This is based on the understanding that the health of individuals and communities cannot be separated from that of the ecosystem that supports it. One of the important goals of organic farming is to produce high quality nutritious food, which is safe from chemical fertilizers, pesticides, animal drugs of food additives with bad health effects. The **ecological principle** is about modelling agriculture so that it emulates ecological systems and cycles and works with them in ways that sustain them. Re-use, recycling and efficient use of materials and energy are key components of the principle of ecology. Organic farming seeks to achieve ecological balance through the design of farming systems as well as through maintaining genetic and agricultural diversity. The **principle of fairness** refers to equity, respect, justice and stewardship of the shared world between people and other living things as well as among different actors in agriculture: farmers; workers; processors; distributors; traders and consumers. This principle is also concerned with ensuring that future generations do not get disadvantaged by current production and consumption patterns. Social and environmental justice is considered important. The **principle of care** says organic agriculture should be managed in a precautionary and responsible manner to protect the health and well-being of current and future generations as well and the environment. It is under the principle of care that issues of risks and appropriate technology fall. At the same time, the principles recognise that both scientific knowledge and practical experience should be used to build an agriculture that is safe, healthy and ecologically sound

(http://www.ifoam.org/about_ifoam/principles/index.html)

1.3 Research questions

The study aimed to explore how farmers are learning and practising a form of sustainable agricultural practice called Organic Farming. More specifically, it intended to address the following questions:

- e. Why are farmers incorporating sustainability in their agricultural practices?
- f. How do farmers learn about sustainable agriculture in their workplaces and homesteads?
- g. What are the main features of Isidore Farm Organic Farming Activity system?
- h. What are the current limitations and contradictions faced by farmers in learning and practising Organic Farming?
- i. What factors enable, constrain and underlie the learning and practising of the Organic Farming?

1.4 Methodology

The study uses lenses from critical realism philosophy to establish causal mechanisms, and the interplay between **structure and agency** as a basis for potential transformation. It also uses Cultural Historical Activity Theory (CHAT) to give a theoretical framework on how people learn through activities. The theory of practice is also employed to see how the embedded and unconscious **dispositions** influence learning and practice. It is used alongside a workplace learning theory that builds on the interaction between work **identity**, work

practice and incentive/**motivation**. The findings from this study, especially **contradictions**¹, are going to be used as potential sites of modelling solutions to some of the issues being confronted in the OF during the next phase of the study. The methodology employed is Developmental Work Research, which uses contradictions as the germ cell for potential learning. I used semi-structured interviews for data collection. Interviews lasted between 30 minutes and two hours each and I had to hold follow-up interviews with two research participants. After collecting the data, I transcribed it and produced about 160 pages. I then used this data to answer the research questions. In addition to the interviews, I collected data relevant literature from the Internet, which also informs the report. For analysis, I used the CHAT, theory of practice and causal mechanisms to try and explain empirical information. The purpose of sharing this report is to seek validation by research participants in terms of the **emerging** findings and interpretations.

2. FINDINGS OF THE STUDY

2.1 Why are farmers incorporating sustainability into their practices?

2.1.1 Triple bottom line

Ecological, economic, social (and health) considerations encourage some people to adopt sustainable agriculture. Many go into sustainable agriculture because it does not poison the environment and the consumers. So there is both an ethical and an environmental reason. Higher nutritional quality of organic produce for healthier society was cited as one reason during the study. With declining water availability in the area under study and in the southern African region, some farmers interviewees decided to go into organic farming because it conserves water. Almost all interviewees went into agriculture because they wanted to earn a living. One trainer/farmer went into sustainable agriculture in order to help build a responsible agrarian consciousness in a society that looks down upon agriculture, especially low external input agriculture. There are others with a social and equity motive, to use the land responsibility today for the good of future generations:

Organic farming is good because is not affecting the soil. We need to make sustainable development in agriculture, which when we are farming now, when we die even our little child gonna use that because we are not killing the soil (Interview #SA7).

So when I came across this Permaculture and Organic Farming, it was about taking responsibility for my existence on the planet, to stop being a parasite, and to start actually contributing something not only to the environment but to society, but something real, something tangible you know. The realisation of how destructive our survival has become through commercial agriculture, it hit me very hard (Interview #SA2).

2.1.2 Passion within and the pull of circumstances

¹ Contradictions are historically accumulating structural tensions within and between activity systems. They are clashes which hold back the development of an activity system but also serve as potential places from which to learn and improve an activity system.

Three out of the ten interviewees indicated that they went into organic farming because they had a passion for farming, and especially for sustainable agriculture. In addition to passion, people can potentially go into sustainable agriculture simply to produce a little bit of food as a hobby, for recreation or to de-stress. Some farmers and agricultural trainers are either self-motivated or externally motivated. One trainer went into agriculture at the persuasion of his father, while one mentor promotes it because it has potential for the poor whom he works with who can afford it. The group of farmers have continued with the project because they are getting something from the garden. About half of the interviewees went into farming because of the potential to earn a living from it. For example, one interviewee responded, “*I was think it is good when we doing farming because no work now in the world,*” (Interview #SA7).

2.1.3 The promise in the practice

Some farmers go into sustainable agriculture when they see that it works. One farmer who is also a trainer was motivated when he noticed how little space was needed to produce food for a family. “*What amazed me was how you could pick dinner for a group of six people from a small garden like this*” (Interview #2). In addition to knowing that it works elsewhere a potential farmer is further motivated when he has got the land upon which to practise it. The tenure should be secure enough to allow the farmer to invest years in building the soil with a view to getting returns, especially in the future.

2.1.4 The pull of the past, ‘it is in their veins’

Almost all the farmers and extension workers interviewed had a grandparent or parent who was a farmer. It was mostly grandparents though, suggesting that the coming of industrialisation over the last two to three generations had an impact on what people ended up doing in life. Knowing someone in the family who was a farmer tended not only to inspire respondents to go into farming but also to know something about farming, to have a feel for it. The difference in some cases lay in the kind of farming people grew up experiencing. Those who had parents who were farmers were exposed to conventional farming while those who were exposed to the farming of their grandparents were exposed to traditional farming which shares some features of organic farming, especially in terms of low external input. Out of the 30 people that were identified and supported by a local church since 4 years ago, only 12 remained. Some have stopped coming because they are receiving grants and others for other reasons. When asked how many of the remaining 12 were already actively engaged in farming when they received, the mentor said 80 %, suggesting that most of those who stayed had a history of farming. In a separate interview, one trainer noted that the rate of success in making a person who was not a farmer become a farmer, is 10 % to 20 %. This resonates with the earlier comment.

Interviewee: *I am not sure he would say I taught him. He would probably say **farming is in his veins**. He is also patient about the soil. He has always had a piece of land. He has learnt a lot about organic growing. He always does it the right way using compost, staying away from scab. He grows potatoes.*

Interviewer: *When you say it is in his veins what do you mean? Do you mean that some people are born farmers or are brought up in farming families or something else, what do you mean?*

Interviewee: *Saying that people are born farmers is going into a different realm but everybody, when they are born, they have a calling. It is the only way I can describe it. It is a kind of a calling. Many commercial farmers now are doing it just purely for the money. It's like doctors are doing, practising medicine for the money. But some of us will do it no matter what happens (Interview #SA9).*

2.1.5 Exposure

One trainer had to spend about five years out in the fields practising agriculture in order to acquire practical knowledge on farming. He started by looking after goats, then herding Nguni cattle, growing vegetables, looking for and working in organic farms. He travelled 9,500 km across South Africa getting exposed to different agro-ecological conditions and working in them.

After this exposure and acquiring practical and tacit knowledge, some prefer to complete this with conceptual and explicit knowledge, which they would often need if they are to teach other people in different agro-ecological situations. As Interviewee #2 noted, *"I am also aware that my strongest point is that I have learnt through application but that is also my weakest point. You know, so I am trying to broaden my horizons."*

2.2 How do farmers learn Organic Farming in their homes and workplaces?

2.2.1 OF farmers learn primarily through scaffolding

Scaffolding refers to learning that is done through the help of a more knowledgeable other. Inorganic farming the MKO other can be a trainer or a fellow farmer. The three-day workshops that are run on OF and Permaculture are normally conducted by trainers who know more about the subject than the participants. They share their knowledge with farmers who internalise it during the workshop and externalise it in their fields and gardens. In some cases, the farmers do not grasp the key concepts and when they try to apply them, they are ineffective. This forces them to revert to the old system of growing crops as was illustrated by the group of 12 women who stopped using organic manure, removed swales in the garden and started using chemical fertilizers. However, the reasons for poor application are not always about not knowing enough. Farmer to farmer training takes place extensively in the case study. The 87-year old has acted as both a source of inspiration, ideas and physical tools for use in organic farming. The more experienced farmers who understand the local agro-ecological conditions well advise newcomers on what to grow, when and how best to do it.

2.2.2 Farmers also learn through linking everyday knowledge to scientific

Most farmers interviewed did not have an interest in reading formal literature to support their agricultural practices. They preferred to learn *'from the soil'*. However, those farmers who also serve as facilitators are making conscious efforts to link the everyday knowledge to scientific knowledge. They do that with the farmers they work with as well. One of the clear examples of this attempt to link everyday knowledge to scientific knowledge is reflected by one of the farmers, who is also a trainer who is currently studying towards a Bachelor degree

in agriculture. This is what he had to say about his decision to pursue formal education further, *–So I wanna be able to talk the lingo. I wanna be able to stand in front of a farmer and not be caught out because I do not know an obvious thing... I am also aware that my strongest point is that I have learnt through application but that is also my weakest point. You know, so I am trying to broaden my horizons” (Interview #SA2).*

2.2.3 Farmers also learn through trial and error

The 87-year old organic farmer spent the last 50 years trying new things and establishing that which works, retaining it. She experimented through trial and error. This is true of the other farmer who has been in the business for the past 25 years. He likes observing and making the necessary changes if things do not work. The people in this case study occasionally share their lessons, especially when asked but there is no systematic way of jointly identifying and solving problems, something that would lift their current learning strategies into collectivist or expansive learning.

Interviewer: *Do you have any manuals or guides that you refer to?*

Respondent: *I don’t, honestly I don’t. We wake up in the morning. We know what to do. If it is raining, we can’t plough and we don’t water.*

Interviewer: *What kinds of questions have been brought to you by other farmers?*

Respondent: *Well, how to grow carrots. We grow carrots here and they do very well. So it is quite simple, the bed must be well prepared and thorough watering because if you water with a watering can you are only watering one inch deep and for the carrot, once it has germinated, the ground must be wet – keep moist until the carrot is looking strong. And then let it dry depending on the weather and the time of the year. Whereas if you don’t water correctly and the carrot looks for water, you don’t get a good crop – yaa that is the most important thing with carrots. Also getting the right seed variety for the area.*

Interviewer: *Where did you learn that from?*

Respondent: *From practice. It became obvious to me that you needed water and good drainage (Interview #SA9).*

2.2.4 Farmers learn mostly through practical activities

One of the most commonly used strategies for learning organic farming in the case study is practical activity. Farmers seem to prefer this method because it also addresses the communication barriers that come with learning in a language they are not familiar with. Practical activities are also handy because there is little in the form of resource materials in the local language which farmers could use. In addition, practical work means working with examples that can be replicated. In its outreach programmes, one of the training centres in the case study spends three days of their initial training doing practical work in the homes of the farmers so that even after the training the farmers have somewhere to refer to, ‘practical and living notes’ as it were.

2.2.5 Farmers learn from living examples

Farmers showed that they find it useful to learn through seeing the real things, evidence that they work, not just theory. If there are no working examples to learn from, farmers find it

difficult to learn from what is abstract. One of the trainers in the case study was aware of this need right from the beginning of his career in organic farming. That is why he travelled over 9,000 km in South Africa over three years, looking for real and successful examples. Following this exposure, he made it a point that he would not start training others before he had established a garden himself. He has since done that and uses it as a learning tool to demonstrate what is possible and uses pictures of the past to illustrate the process-oriented nature of organic farming such as building diversity not happening over night.

2.3 The Organic Farming Activity System

The figure below (Fig. 1) highlights some of the main aspects of the Organic Farming activity system which is under discussion. It comes from the perspectives of both the farmers and trainers who participated in the research. It is usual for showing the different elements of the activity system and how they potentially relate with each other. In short, the actions of the subjects on the object are mediated by for elements; the tools; rules, community and division of labour. When there is problem in each of the elements or between them, then contradictions are said to exist. The activity system interacts with others, which have potential to generate some contradictions as well. These are discussed under 2.4.

Mediating artefacts: Accredited training; 3-day workshops; look and learn visits; learning by doing; observation; trial and error; swales; windbreaks; live fences; composted, horse manure, cattle manure, earthworms; hoes; garden forks; shovels; farmer to farmer extension; farmers' markets; organic market; internet, books, manuals; seeds; seedlings

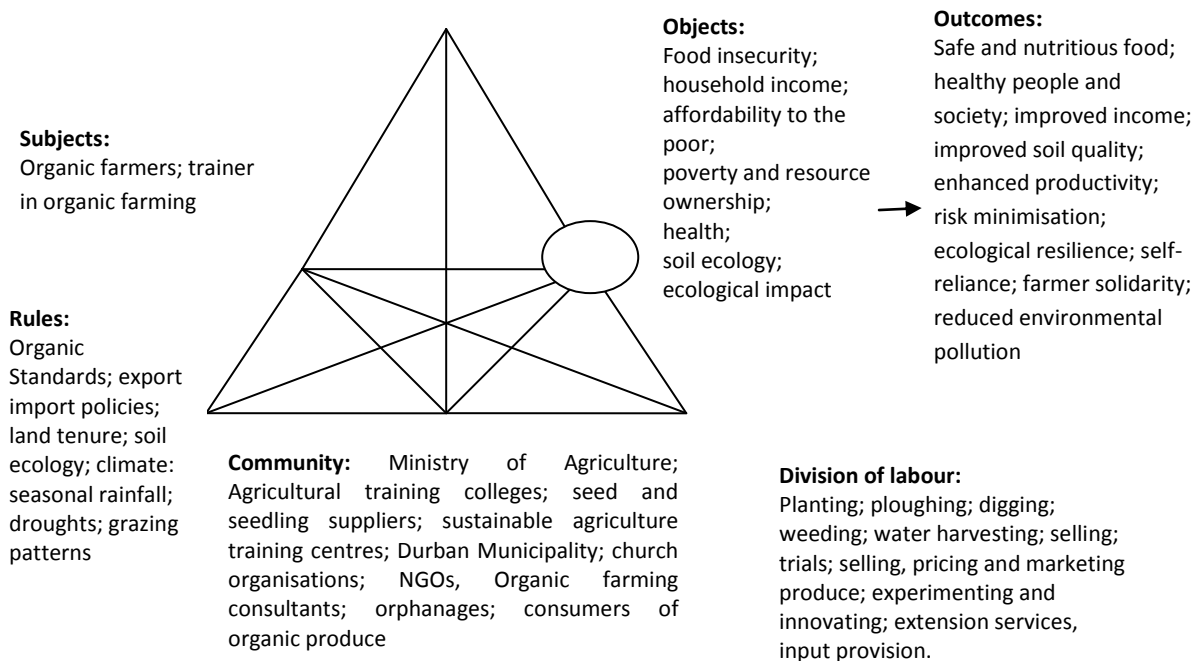


Figure 1: Organic farming activity system

2.4 Clashes, contradictions and disturbances in Organic Farming

2.4.1 There is lack of appropriate technology to support organic farming practice

Interviewees noted that one of the main challenges facing organic farming development is the fact that it is labour intensive. This discourages some farmers from adopting it. In addition, embarking on winter cropping which was reported to be more profitable in the area requires even more labour compared to summer rain-fed agriculture that most small scale farmers practice in the area. Specific challenges mentioned are seed planting, the making of compost, which also takes time compared to be buying or ready-made oil-dependent chemical fertilizer, and weeding as organic manure and non-use of herbicides. There are a lot of tools that were used traditionally in different cultures, including those from Europe, which were useful for cutting drudgery and which are still being used there. These include tools such as a chuff cutter and a scythe, which are only found in second hand and antique shops. Others make planting seed and weeding less cumbersome. In some cases, the tools are produced but not marketed adequately. For example, in Durban, there is a local company called Lush, which produces excellent agricultural equipment but sells through other people, who prefer to market those tools that have big demand and these are usually those intended for large-scale production. This has also undermined the distribution of certain tools or technologies in South Africa, even when they are there. As one interviewee noted, *“You can buy a mulcher at R22,000 that does the same job at 50 times the speed but requires petrol, requires maintenance, requires a mechanic”* (Interview #SA2). Therefore, other mechanisms of linking the producers of technology and the consumers may need to be established.

Apart from the hard technologies, organic farming in the area under study lacks adequate soft technologies such as appropriate seed and organic manure. In addition, the pest control strategies employed in organic farming take time to become effective partly because the pest-predator relations are already disturbed in favour of pests. In some cases the habitat to support pest-eating animals have been destroyed, flowers to attract such predators as birds no longer grow.

2.4.2 Farmer selection, training and post training support in organic farming is weak

Farmer selection (for teaching and support) is one of the weakest linkages in sustainable agriculture development. Training of trainers has also met its challenges so has time and resource limitation. The following points capture the main issues raised:

- Poor selection processes (policy) where the councillor chooses cronies and pretty girls to get free lunches and so on, instead of sending serious farmers for organic training. Trainers interviewed in the study said having two genuinely interested participants in a workshop of 30 participants is considered good;
- Training of farmers takes two to three days, which is generally too short. However, there is a general and wrong perception in response to the question regarding the appropriate length of training. The subsequent and formal learning time is not included;
- Language is a barrier in some cases because many organic farming trainers are not being fluent in the local language, Zulu and the locals are not fluent in English either;
- Ambivalent messages from different agricultural organisations including consultancy firms, NGOs and government, *“Until there are agricultural NGOs actually actively promoting ecological agriculture, what is a crazy white like me going to say to 30 old*

gogos down in Mboweni when they see the NGO coming everyday with its version of agriculture? What credibility do I have there?” (Interview #SA2);

- Spreading resources for learning/training too thinly in order to cover as many people as possible. As a result many farmer groups in the study cannot raise seedlings on their own. Some have not understood the basics of organic farming and Permaculture;
- Lack of follow up as evidenced by the shock of the trainer when he realised that people had reverted to conventional farming practices; and
- ‘Tall poppy syndrome’ where new and emerging farmers are sabotaged and undermined because jealousy and unwillingness to accept that the ordinary can emerge and become better (but swinging the pendulum too far could lead to the ‘Matthew effect’, that is, ‘To he who hath, more shall be given’).

2.4.3 Double stigmatisation of sustainable agriculture

The agriculture profession is not seen as ‘mental sport’ in South Africa, especially by communities that have been, are and want to move away from being seen as rural and agrarian to being modern and industrialised. The situation is even worse for sustainable agriculture which is seen as taking people backwards supposedly because it does not take full advantage of scientific and technological development. Youths are getting less interested in pursuing agricultural studies because agriculture is not seen as ‘cool’, ‘sexy’ or modern, especially organic farming and other forms of sustainable agriculture. Some parents share a similar attitude towards farming and prefer to buy rather than produce, as one graduate was reported to have said at a PELUM Food Sovereignty workshop *“That story of the black woman that got a successful job and was taking food back to the family and the family stopped growing vegetables. That needs to be told. That story was so powerful” (Interview #SA2)*. Fellow farmers have also been using peer pressure to belittle organic farming as one farmer recalls, *“I was the first organic farmer in Natal. And other farmers, they laughed at me” (Interview #SA5)*.

The developed world went through agricultural revolution before their industrial revolution and developing countries are generally agrarian and not yet industrialised. So there is a general perception that an economy’s advancement is judged according to how industrialised and less agrarian it is. Organic, with its less reliance on bio-technological advancement – such as not using chemical pesticides and fertilizers, or Genetically Modified Organisms – is seen as backward. This gives sustainable agriculture two-layered stigmatisation. An interviewee in the study captured the point succinctly when he said:

One of the largest stumbling blocks I have come across in working with trying to train people in small scale agricultural development is the negative effect of the education system of apartheid years where if you were clever you went to a normal school, and if you weren’t so clever but were good with hands you went to a technical school and if you weren’t good with your mind or hands, you went to agriculture. There is a stigma attached to agriculture that prevents our society to the core, where especially people who in the last two three decades, a lot of people got uplifted from agriculture areas into urban and have finally got a job through much hardships and much perseverance in the commercial sector. To hear that his son wants to do agriculture is like a knife in the heart (Interview #SA2).

2.4.4 Inadequate pool of effective trainers

The majority of extension workers in the country are trained in conventional agriculture where taught curriculum marginalises all forms of sustainable agriculture, including organic farming. Consequently, they are not prepared to teach others what they are not confident about. Those who get trained in sustainable agriculture in other places face problems too. Some trainers of trainers in organic farming are novices and do not adequately prepare extension workers for the task. They end up poorly preparing other farmer trainers, who in turn cannot adequately facilitate the learning of farmers, thereby undermining the proper development of the practice. In one instance encountered in the study a person with no background in agriculture was assigned a mentorship role in agricultural projects. There are also some people who receive training in agriculture, not because they are interested in the profession but because they want to obtain tertiary qualifications. Similarly some workshop participants are driven by the desire for free-lunch and certificates rather than interest in agriculture. Most of the agricultural extension workers in conventional and sustainable agriculture are men while most of the farmers are women. The low proportion of women extension workers can be traced back to apartheid as well as to the perceptions of local people about which careers are suitable for men and women. There seems to be another deep rooted problem concerning the local culture. One farmer pointed out that traditionally women do not take positions where they tell men what to do, and it is possible that women extension workers would have faced problems in providing services to adult men. In the field trainers face the challenge of not having enough good sustainable agriculture working examples. In addition, they often do not have adequate resources to prepare learning materials that are appropriate for farmers.

Meanwhile one of the contradictions that needs to be attended to are how much time and resources to put in the training at the centre and how much in outreach programmes with farmers, how much to invest in train the trainer or work directly with farmers. And at either place, the challenge of how much time to allocate to learning theory and how much to practice in the given time remains.

2.4.5 Certified organic farming has difficult conditions to meet

The regulations that govern organic production are difficult to meet for small scale farmers. First there is the conversion period during which their produce cannot qualify for the premium prices. This can take up to five years. One of the challenging issues in communal area settings is that organic produce can only be certified to be so if there is no conventional farming within a certain distance of the field it was raised. This means that neighbouring fields, should be following organic farming methods and in communal settings, one cannot dictate how the next farmer grows their crops. The second and major hurdle is that of cost of registering inspection, at least 20,000 rand per year. Most small scale farmers cannot afford the fees. However, one of the successful ways of dealing with this in the area under study was the formation of a 200-member farmer group that produces organically and shares the inspection fees. Organic farming is also undermined in areas where there is insecurity of tenure because farmers will not invest in building the farm ecology if they are unsure about when they may be asked or forced to leave the land.

2.4.6 Small-scale organic farming does not meet farmers' needs

Farmers who are practising organic farming on a small scale often have to complement it with other forms of livelihoods such as carpentry and consultancy because it does not meet the family needs such as paying for school fees. One farmer who utilises about 7 hectares pointed out that organic farming cannot and is not intended to meet a 'western lifestyle'. Other organic farmers were concerned that current consumer power, consumer preferences, buying where they buy is still tilted in favour of conventional farming. This can be partly attributed to the pricing system as conventional produce tends to be cheaper. One interviewee pointed out that some of the people living with HIV/AIDS whom he works with, prefer to eat produce from conventional farmers because it looks better and healthier and is often neatly packaged. The pests which disfigure the produce – by for example putting holes on cabbage – are immediately dealt with in conventional agriculture. Meanwhile there is already growing concern that large-scale organic producers are practising mono-cropping, which goes against the idea of diversity, a central theme in sustainability. Feedback from six out of the ten interviewees who were able to score organic farming against three criteria of ecological, economic and social value reveals that the area needing most attention is the economic (Table 1).

Table 1: Summary of sustainability scores on Organic Farming in South Africa

Interviewee	Ecological score	Economic Score	Social Score
#SA1	9	1-2 in Year 1; 9-10 in Year 15	10
#SA2	8	6	10
#SA1	9	6	10
#SA6	10	3	7
#SA9	10	10	10
#SA10	9	10	8

2.4.7 Lukewarm government attitude and low local authority capacity

The support that the government offers farmers tends to be directed towards conventional agriculture. This is reflected in the kind of courses that are offered and supported by government bodies in the country. The Youth in Agriculture and Women in Agriculture programmes that were recently launched do not reflect a sustainability dimension in them. The low support is further worsened by a poor grasp of sustainable development concepts in government institutions such as municipalities who have resources to spend on projects. Some of this low capacity was attributed to loss of institutional memory in the Municipality which undermines implementation of environmental programmes. *“And then you hear the budget has been allocated but they were not spent. So there has been a kind of collapse in municipal institutional memory. There is no institutional memory anymore. No one knows how to issue a letter of appointment, how to take a project tender and if not a tender how to take proposals and push it through council approval system” (#SA8).*

2.4.8 Inadequate water and poor soils

Water is one of the most important factors in agriculture. It has had a limiting effect in some places, especially during the dry winter months. In others, such as peri-urban areas, it has

been the breaking down of the pipes and the high cost of water that has undermined agriculture. Given the projected decline in rainfall the price of water is likely to go up and more efficient water use has already become imperative. Recurrent droughts have also tended to undermine agriculture, especially that which is rain-fed. Soils that are poor take long to build during which time production levels are low and therefore discouraging for some farmers. The temptation to use inorganic fertilizers is greater under such circumstances.

2.4.9 Thefts and the resultant insecurity

There are several ways in which theft is affecting sustainable agriculture. At one level, it is forcing the more vulnerable such as the 87-year old lady to plant crops that people would not steal, thereby shaping the cropping choices. She now grows rhubarb which locals do not steal. She has severely cut on livestock keeping from over 20 to only one because half were stolen. In a different neighbourhood but within the same case study, neighbours stole from the garden of a sustainable agriculture farmer when her husband was away nursing their sick son. However, when he returned and they knew he was around, they stopped stealing, suggesting that females are more vulnerable to theft of this nature, *“I think they was finding a chance to steal our vegetables because there were seen that the Rasta is not here that is why they steal because when I am here they not steal, it means they respect me”* (Interview #SA4). In another incident, thieves stole computers and other equipment which were being used during a Permaculture and Organic Farming workshop, which made it difficult for the trainers to teach the intended curriculum adequately.

2.4.10 Confusing information from the corporate sector, local and international

Agriculture is a place where many interests clash. The corporate sector is interested in agriculture that makes money for them and this object does not always promote ecological and social sustainability. As a result, their agricultural messages tend to be biased towards the use of agro-chemicals fertilizers, pesticides and herbicides and well as hybrid seed and GMOs. These may not be suitable for certain situations and certain groups of people. Their approach runs against that of organic farmers who emphasize low external input, slow food and as little carbon footprint as possible. Farmers receive information from these sources and others and often find it confusing.

2.4.11 HIV/AIDS pandemic

The HIV/AIDS pandemic is killing many people in the agricultural sector, thereby depleting the skills base, which undermines the practice. In addition, it is causing many people to become too weak to work, especially when they are sick. In many communities, child-headed families have emerged. Some of these children have to become farmers but often they do not have the experience of farming nor the energy to do it. The pandemic therefore has implications on the nature of technologies that may be necessary for as long as the pandemic prevails. In some cases, the orphans are too young to grow food for themselves and have to be assisted by the community, thereby increasing the local dependence ratio. The need for producing food here and now becomes even more imperative in a way that could undermine sustainability. Speaking on the need to produce surplus food for the community and not for sale one interviewee noted, *“You saw the school down there, well at the school down there, there is a home full of children who are orphaned. Their families died of AIDS. They were*

brought in by neighbours or by family but there is a hundred of them in that school alone and any surplus food that we grow from that side, we push down into the school” (Interview #SA10).

2.4.12 Prior exposure to conventional agriculture

There is also a downside to prior exposure which makes it difficult for people to change their way of doing things. Farmers who have been practising conventional farming find it difficult to accept sustainable agriculture and practise it. This is the case for the parents of one farm worker and two trainers interviewed in the study. One group of farmers finds it difficult to apply compost, plant seed and water because they are used to just planting and leaving the rest out as this group member pointed out:

They don’t want to change from what they know, if she knows that we are just to put a hole and put the seed and cover and go away, if you say ... make the hole, put your compost or manure, water and plant. „Oh it takes time”, they think it takes time to do those things, yes, but there are some who like to do things or stay like this, you must do this (Interview #SA3).

There is also a suggestion that exposure to monoculture in agriculture might foster a positive orientation to it and that experiencing diversity might encourage people to promote and live it as this trainer pointed out:

Growing up where I grew up in Pietermaritzburg there was a vast monoculture of wattle and I spent the rest of the first half of my exploration in the younger years in the wattle plantations... It was later that we came to a green belt called Fern Cliff Nature Reserve and suddenly there was diversity. That was a very profound change in my development as a child to come across this natural forest with all the birds... Suddenly there was this massive diversity which was just very exciting (Interview #SA2).

2.5 What factors enable, constrain and underlie the learning and practising of the Organic Farming?

2.5.1 Gender and farming

One of the challenges in agriculture is that women have traditionally been excluded from doing some jobs and very few have been trained in agriculture. Therefore only a small percentage of agricultural trainers in government and in NGOs are women. This can be traced to the policy on agricultural training which favoured men at the expense of women. There has therefore been a tendency to see agricultural extension as a preserve for men. At the farms, women tend to do the more detailed and tedious work while men do work which required more energy and this has been attributed to their different physical abilities. One interviewee made the point that less heavy does not mean less difficult or less demanding. He observed that the horticulture industry in South Africa is dominated by women because men see most of the work there as feminine.

2.5.2 Time and space considerations

a. Trainers need time to master the practise

The learning and development of organic farming has important time and space considerations. The time consideration includes the fact that trainers have to spend adequate time learning the practice before they can become competent to facilitate the learning others as the more knowledgeable other. For example, a qualified agricultural extension worker trained in Permaculture and organic farming at NQF Level 5 over nine months still felt that the time was not enough for him to learn enough and has to refer some farmer questions to those who trained him. Another had to spend nearly three years moving from one farming enterprise to another to learn and has developed a library at his farm so that he can keep learning. In addition, he has begun doing undergraduate studies in agriculture. Here is what a farmer trainer had to say about getting prepared for the task:

“I want to learn more about what I am doing because although I understand the ecological side, there are certain aspects of agriculture that I still have to understand. I have heard too many times that yes, ecological farming is great but it does not work on a large scale... I want to be able to offer my service and knowledge as a consultant to industrial agriculturalists, to help them rehabilitate their systems, if not conform to organic agriculture, at least make it a little bit ecologically sound” Interview # SA2. He further made an interesting link between practice and learning, *“Time to practise, without implementing, without starting, without doing, you learn very little” Interview #SA2.*

b. Learners need time for initial learning and subsequent accompaniment

Farmers need time to learn too and some take longer than others to learn the same things. But generally there has been a problem of setting aside too little time for learning and follow up. Most of the initial training of people in farming takes a mere three days and there is little follow up to complement this. Consequently, the trained farmers do not get a good grasp of the principles. This was the case with the group of farmers who stopped using organic material, who removed vertiver grass and swales that they had established in their garden. They also began using chemical pesticides to kill ants whose problem could be traced back to lack of organic matter. Another farmer was not using kraal manure because he thought it would burn his vegetables. One farmer, who is also an entrepreneur noted, *“Our farm labourers, everybody had to be taught the way our system works, but it didn't happen overnight. Our own learning on our own particular farm ... took much more time, than we estimated” (Interview #SA1).* An extension worker observed that it takes a lot more effort to teach old people a new practice and he had to remind them again and again.

c. Time, age, energy and practice

An organic farmer who is now old (about 80) and has two farm workers has had to scale down on production because she has little energy to run around. Besides, as one of the farmer commented, she has tended to shift her attention towards plants that require low energy input such as fruit trees. The old lady removed flowers from her veranda and planted vegetables and herbs which she needs more than flowers. She picks them fresh and cooks them. This is an energy saving decision.

d. Time to build soil ecology

The other important dimension of time and space is that it takes time to build the soil, and the poorer the soil, the longer the period needed. There are no short cuts to developing the soil ecology and as these two interviewees illustrate.

“As I said the land was a desert and my grandmother gave her children, she had nine children. Each child got seven acres and we started on my mothers” seven acres. The fire had destroyed all the goodness; it was a desert so we tried this and that and couldn”t get going... It was dead. It was dead and took me several years to get life into it through organic mulching, lots of grass, lots of grass” (Interview #SA5).

“I would have to say a biggest obstacle would be trying to convert organic farming into a financial sustainable project into short time. We also at beginning thought we will do like quick, quick but it wasn”t going to work. What we found working was networking with other farmers... We have been building up our own farm all this time we”ve been doing a lot of soil feeding and all of that at the beginning we did try quickly to make a profit overnight, quickly putting in crops and harvesting but we encountered many difficulties with that because our farm infrastructure wasn”t ready” (Interview SA#1).

e. Time to convert conventional farmland to organic

In organic farming, there are other important time and space dimensions. If the area in question has been under conventional farming, there is a changeover period which must be observed before the land qualifies for organic production. This is to allow for the disappearance of chemicals that might be on the land. The fields in which organic produce may be certified should be a certain minimum distance from fields in which conventional farming is being practised. This is especially important where cross-pollination is possible. In general, it takes at least two years for one to become a certified organic producer.

f. Seasonality and agricultural activities

Seasonality has a bearing on the kind of agricultural activities and crops that people may grow. But certain traditional practices have prevented the local people from taking full advantage of horticultural crops in winter, which is where the potential of the area lies. The Zulu people do most of their farming in summer, which is when organic producers complain of poor vegetable production due to pests and climatic conditions. The main reason why the Zulu people do not grow much in winter is that it is generally dry and they would need to water the gardens, which brings new challenges of labour and equipment as one interviewee notes, *“We try to produce throughout the year but the winters are very dry” (Interview #SA3).*

g. Time to build responsible agrarian consciousness

Finally the building of a new practice needs even more time because a new consciousness has to be developed. This is particularly important in situations where the practice may be stigmatised as is the case with organic farming and other sustainable agriculture practices. As such, it is important to have a longer timeframe for building such consciousness, even beyond this generation.

“Look at the development of organic development beyond government terms of office, beyond now, but far into the future generations. Success of organic development should be judged

against a longer timeframe. So my personal belief and understanding, I got to a point where I am no longer happy to work with a group over six months or a group over two years or even a group over ten years. I have removed myself, my thinking and my success fallacy from that timeline altogether. I am looking at it now over generations” (Interview #SA2).

New structures that support new practices have to be developed and elaborated so that children may grow in them and internalise them from when they are very young. This will help deal with the current negative attitude towards agriculture, which has been nurtured over generations as civilisations moved from being agrarian based to industrial.

“So I am looking at organic development at this point as being the development of the agrarian consciousness so that children that are born into this world now, like my own two children can grow up in that environment of knowing and of understanding agriculture from an ecological point of view, not having to break down preconceived ideas, not having to culture a realisation of the importance but these need to be fundamental knowings within people from the time that they were born” (Interview#SA2).

Box 1: Reconstructing and embedding a positive identity of farming – “make it cool”

So what can help make agriculture work? You need to make it cool. You need to make it sexy. You need to make it socially valuable (Interview #SA2).

One of the possible responses to the negative perception of agriculture is to de-stigmatise it. This can be done by making it cool as one of the respondents said. Making it cool means making it more appealing than it is today. One of the greatest ways of making something appealing in today’s world is to offer economic rewards that are attractive. In the field of agriculture, it is to make sure that right from primary school, children are able to appreciate and value agriculture, so that agriculture is not seen as punishment, which has been happening in many schools. When a pupil does something wrong, they are assigned agriculture, thus reinforcing negative images of it. The efforts of the school also need to be complemented by those at home, where parents also do things to expose their children to agriculture in a positive way. One trainer called for the propagation of agrarian consciousness, which would embed agriculture in the conscious and subconscious minds of people from an early age. He was quick to point out that this would not take a year or two, a decade or two but generations:

We have got to propagate the consciousness before we can make the farmer. We have got to give examples of the farms so that youngster growing up can be the farmers and commercial farmers of the next generation to capitalise on this industry...We are looking after it for the next seven or eight generations, whatever decisions we make now in our practices. It’s going to influence seven generations down the line (Interview #SA2).

4.5.3 Interaction between organic farmers and other key stakeholders

a. Offering recognised training

Within the organic farming case study, there is evidence of interaction between the structures and the people who seek change. The current structures in government and municipalities

tend to favour conventional agriculture. People who are pushing for a shift towards sustainable agriculture are using several different strategies to engage the structures. One of the main strategies seems to have been the introduction of certified training in Permaculture and Organic Farming. This strategy would tend to attract the young people who are seeking qualification and may want to work in the field of agriculture. The official recognition of such training makes it more attractive than the other courses. Interactions with two people who attended the nine months course suggests that it has been successful in making them appreciate the good in sustainable agriculture but both still question it's economic viability – an area which seems to need more attention if the practice is to grow widely. The implementation of the curriculum is effected through a college that was established by a consultant. For long term sustainability, the people should use their power to influence government not only to sponsor students to attend such courses but to also establish colleges that teach sustainable agriculture. Initially the government could introduce sustainable agriculture in its existing agricultural colleges and universities. In addition, the government extension system needs to be improved so that it reaches more farmers more frequently as one farmer noted:

It will take a long time the extension service to come to visit. I don't know when I last seeing those people, last year in April until now. I don't know what I can say because if you are working you'll be very happy when you see someone people coming from the department of government to see what we are doing and asking you many questions you'll be happy (Interview #SA4).

b. Establishing training centre and outreach programmes

A related development is the setting up of Permaculture Training Centre which also teaches Organic Farming. This Centre teaches short-term courses and caters for people already employed such as municipal workers. It also caters for farmers in the urban, peri-urban and rural areas of the Province. The short term course last about three days and have been criticised for being too short to help farmers to grasp the essential principles and methods. The agency of this centre and others would be enhanced with more time allocated for training, and supported by follow up. Another strategy employed by the centre is doing outreach programmes, where trainers go among farmers in their areas and train them sustainable agriculture. The outreach programme also has a short training span of three days. Its main advantage is that it leaves the farmers with working examples. Each day is spent doing practical work at one home of the participating farmers. There seems to be tension between the amount of time that should be spent on training at the centre and that devoted to outreach programmes. There seems to be a growing preference for the latter. In both cases, agency would be enhanced by creating more contact time between farmers and facilitators.

c. Setting up working examples, “small winds”

A third strategy being employed to influence society to adopt sustainable agriculture is the establishment of successful working examples of farms based on sustainable agriculture. Members of the society from the influential politicians to the ordinary farmers, from the government bureaucrat to the most junior officer are being exposed to these successes largely through visits. Another related strategy is to address the economic viability dimension by the establishment of a network of farmers who produce organically and the setting up of farmer's markets and other outlets to facilitate the distribution of organic produce in the area. The farmer's markets help expose consumers to the produce. A family shop that is set up in the

city enables the farmers to reach a wider market. The shop owners collect produce from farmers in the area based on what each farmer is good at producing. This serves to stimulate surplus production. Farmers interviewed indicated that they liked this arrangement because it reduced the ‘distance’ to the market by removing some middlemen. However, the prices of organic produce are higher than those of conventional produce, making it more accessible to the relatively well off and reaching consumers is partly a function of price. The organic shop owners have taken advantage of information and communication technology to enhance their agency by establishing a website. This is probably one way of making it ‘cool’.

d. Collective and relational agency

A fourth strategy the sustainable agriculture people are using to enhance their agency is to pool the human and material resources together to implement sustainable agriculture projects and programmes. The formation of Zulu Organics by the coming together of three organisations and an individual consultant is one such example. This solidarity serves to enhance their collective agency. They allocate each other areas of responsibility according to their respective strengths. This kind of joint action has also been used by organic promoters to help small scale farmers to penetrate the local and international organic market which would otherwise have been impossible for one farmer. Having access to such markets, which pay more encourages more people to practice sustainable agriculture and to benefit economically from it. The Mvulo Farmers Association, which has a membership of 200 farmers in KwaZulu Natal, was established so that these farmers could market their organic produce as one farm. This had a tremendous effect on the costs because where a farmer would have been required to pay R 20,000, she only pays R100 for inspection. The membership and inspection fees would have been impossible for one small scale farmer. There is also evidence to suggest that some farmers want to be visited not more materials and intellectual support for enhancing their relational agency as one interviewee put it:

I am also very happy to meet you and discuss about the garden because we are interested to work in the garden and get something. We are poor. We need somebody like you, who goes around just to visit, just to reassure us, even when we get nothing from the garden but if somebody come and say: „Hey how are you there?“ We will be happy (Interview #SA3).

4.5.4 Possible causal mechanisms

a. Low levels of formal education

A good percentage of the adult population of South Africa has little or no formal education. This presents some challenges for those who might want to acquire new skills, especially when the courses and the resource materials are in English, which is not their mother tongue. Many of the young people who have been to school have not succeeded—especially given that about 35 % do not pass matriculation examinations.

b. Dualistic approach to learning and practice

At a more fundamental level, the education system seems to be informed by Descartes’ thinking that separates things which are united, mind from body, people and their environment. This either-or approach has created dualisms that have led people to treat their environment as apart from them not as part of them. As one interviewee noted, “*Society is no longer integrated with its agriculture. They are two. Society has been separated from nature, separated from religion, separated from spirituality*” (Interview #SA2).

c. Perceptions of what is cool

Many of those who pass matriculation level are less likely to be interested in agriculture because of the stigma attached to it, especially when it is sustainable agriculture. This stigmatisation can be has been partly attributed South Africa's apartheid, "*One of the largest stumbling blocks I have come across in working with trying to train people in small-scale agricultural development is the negative effect of the education system of apartheid years where if you were clever you went to a normal school, and if you weren't so clever but were good with hands you went to a technical school and if you weren't good with your mind or hands, you went to agriculture*" (Interview #SA2).

d. High rate of criminal activity

Over 50 % of the interviewees cited fear of theft as a key issue undermining sustainable agriculture and other enterprises. The fear and insecurity is common in urban and peri-urban areas. The thefts include that of agricultural produce. They also steal cables which, means that electricity does not reach the farms it this is not good for preserving produce before it is marketed. But more deeply, it is the sense of insecurity that undermines agriculture. People are afraid to plant crops around their homes because they are afraid that *tsotsis* will hide there or that their neighbours will not be able to notice an intruder should the home owners be away. Stealing is a form of crime and the incidence of crime in South Africa is high compared to other countries. The tendency to take from others against the law or their will is therefore a fundamental issue that underlies fear and insecurity which in turn undermines certain practices such as sustainable agriculture.

e. HIV and AIDS

HIV/AIDS has an ambivalent effect on the spread of sustainable agriculture. On one hand, it weakens the body to the extent that the low energy levels inhibit the ability if the patient to perform certain tasks. Sustainable agriculture, including Organic Farming and Permaculture are generally labour intensive. This makes it difficult for them to farm this way. The same is true of orphans who are often too young to do some of the physical work; and of the old people. On the other hand, health considerations make it more sensible for those whose immunity is compromised to eat healthy and safe food, which is what organic farming produces. This way HIV/AIDS serves to stimulate organic farming – if there can be effective demand, that is, if the people affected can afford the produce. At another level, government denial about HIV and AIDS led to many people dying from lack of medication or support resulting in about 330,000 deaths between 2000 and 2005 and 35,000 babies born with HIV which could have been prevented through ARVs – (Law, 2009).

f. Apartheid and affirmative action

The legacies of apartheid and affirmative action account for some of the inefficiencies in processing project proposals to do with organic farming. Apartheid made it difficult for the local black population to access good education, land and other social services. And the blacks still occupy different physical spaces in the area as a result of the policy – generally found in the down in the valleys – and also down there on the social ladder, as this interviewee constantly revealed:

*"So he said well if this has gonna be part of our policy then well, let's go **down** we have got to find poor people and sick people, you have got to find them in **down** the valley, not in Kloof. So they asked me to go **down** there and I did... We got involved with the members of the church **down** there, the leaders of the Catholic Church **down** there ...Using the same*

*processes at Louis, we identified 65 farmers **down** there... So one of the things when I went **down** there after about a year, I formed a little committee **down** there to help me distribute parcels, so we took them **down** to the people there, handed out the parcels, make sure that it got down to the people who we had listed... You saw the school **down** there, well at the school **down** there, there is a home full of children who are orphaned” (Interview #SA10).*

At independence affirmative action had to be embarked on to correct some of the imbalances. This included appointing blacks to certain positions where some were not adequately qualified. The handover processes and on-the-job training processes have not always been adequate either. Some institutional memory was lost in the process and this seems to be having a bearing on the processing on sustainable agriculture projects in and around the City of Durban. One trainer put it this way, *“Corruption, and also the city has very strict procurement policies where it is very affirmative, which is fair enough. So it is a combination of things but at the end of the day, I do not think that it is a colour thing it is to do with the collapse of project management skills within the municipality”*.

g. Poverty

Poverty appears to be another important factor underlying people’s training in and practise of sustainable agriculture. While farmers who are interested in sustainable agriculture find it affordable, consumers who want the produce find it unaffordable. In some cases, poverty had created dependence on government. People wait for the government to do things for them. A related problem is that when a local poor farmer has been trained and is doing well, he attracts the jealousy of his neighbours and the phenomenon has been described as ‘_tal poppy syndrome’. Poverty has also been traced back to apartheid’s policy of separate development which resulted in the marginalisation of the majority of the people in the country so that the quality of their education was too low, the employment opportunities were restricted to lower levels in manner that resulted in a vicious circle of poverty.

h. Agro-ecological conditions

The quality of the soil, which is initially dependent on its origin, also underpins sustainable agriculture. Soil of poor quality, such as that within the area under study, which is generally sandy, takes a long time to build if one is interested in organic farming but can be easily manipulated in the short term under conventional agriculture. Another environmental factor which underpins organic farming and other sustainable agriculture practices is seasonality, which in turn is affected by such things as distance from the sea, height above sea level; whether the area is on the windward side or leeward side, and wind movements. The area under study receives summer rainfall and none or very little in winter. This makes it impossible for farmers who practice rain-fed agriculture to produce in winter.

4.6 Conclusion

The case study shows that farmers make strategic choices concerning practices to work with. If they perceive that the practices are practical and affordable in their circumstances and that they address their values and interests, then they will adopt the practice. Judging from the high scores of the social and ecological dimension of Organic Farming in this study, it appears that the people currently place considerable value on social ecology. This may be in part because they are responding to risks of climate change which is manifested in their area through more frequent floods (which killed some people this year and left hundreds homeless), droughts and the resultant scarcity of water. The increasing uncertainty of weather

creates risks that have to be managed through more diversity in farming and through practices that conserve water. The encouragement to farm in winter for people who traditionally farmed in summer only can result in a better spread and mitigation of risks. The high valuing of the social dimension of Organic Farming could be attributed to relatively high poverty and unemployment levels. At the same time, it can be traced back to apartheid and its policy of separate development that left some people ‘down in the valley’ and poor.

The learning processes for new farmers are largely based on the traditional research-design-disseminate-assimilate approach. There is little depth and confidence to let the new organic farmers experiment and learn jointly. However, for the more established farmers, there is considerable self-directed learning through trial and error, and some collaboration in terms of sharing ideas and farming equipment. The need for learning together and bringing different knowledge systems together to test and develop them seems to require more attention. There is evidence that the learning and development of Organic Farming is strongly influenced by time: time to learn new things, to test them, to develop them further, to work together and time to build the soil ecology, agro-diversity, market linkages and nutrient recycling systems. Other factors that enable and constrain the practice are government funding policy, funding for sustainable agriculture education and practice, literacy levels, poverty and the competing interests and values of government, the private sector and civil society.

The potential for improving the Organic Farming in the area appears to lie in addressing issues to do with appropriate technology to address labour intensiveness and save on time; developing appropriate learning materials for populations with low literacy levels; government policy and budgetary provision of educational support towards sustainable agriculture and more support of farmers that practise sustainable agriculture. Addressing the double stigmatisation of sustainable agriculture and building an agrarian consciousness that values the triple bottom line – the economic, social and ecological remains one of the most important challenges facing government and the society if sustainable agriculture is to take root. More women involvement as extension workers in agriculture seems to be another area needing attending. Bringing in the youths on board to take part in agriculture is one of the biggest challenges for current and future generations, given the growing disinterest in the field of agriculture. How can the children’s upbringing at home and in schools help them cultivate a positive interest in and attitude towards agriculture in general and sustainable agriculture in particular? That seems to be the most fundamental question.

3.5.1 Example of feedback on a tool developed in the study

To: Mutizwa Mukute <mmukute@yahoo.co.uk>; Eva Muller <isidore@telkomsa.net>; Rohinee Kalideen <rohinee@postnet.co.za>; Christopher Masara <chriss2002003@uyahoo.co.uk>; Coral Vinsen <vinsen@saol.com>; Dick Kachilonda <dick@wessa.co.za>... more
Mutiswa method.JPG (68KB) View Image

Dear Mutizwa,

Thank you for calling for feedback on the proposed tool. We have used a similar methodology earlier but this is the first time to see it being developed for sustainable agriculture.

It happened that on 16/10 we took some 30 people (extension staff and community members) to visit a project that is engaged in sustainable agriculture. The participants were invited to peer review the initiative and we took the liberty of using this tool in two groups. Attached, a picture of the outcome. We did adapt in the sense that we use 4 possible scores:

1 = No

2 = Marginally

3 = To a fair extent

4 = Significantly

As for comments on the tool itself, the following was raised:

- Some questions seem out of place (use of ICT in case of rural development)
- There could be multiple target groups (is the activity profitable - for farmer, for community hub etc.) - should tool than be used for each of these separately
- Sometimes difficult to use by outsiders as some information may only be available to insiders (should there then be a mix of both as the opposite could also apply)
- Scoring is one thing, discussion the questions is equally (if not more) important. Good facilitation is therefore essential to avoid a few strong voices to set the tone in terms of scoring
- Time should be taken to arrive at a collective understanding of the question prior to scoring.

I hope this is helpful.

Kind regards,

FV.

3.6 TRANSCRIPTS OF THE ISIDORE CHANGE LABORATORY WORKSHOP

This transcript begins in the middle of the workshop when research participants are being asked to choose the issues for which to model solutions. It ends at the end of the four-day, twelve-hour CL workshop after a model solution was reached. I have divided it into parts based on what I consider to be different foci of the conversations.

Part 1 (on ranking of issues identified)

After further discussions on the synthesized list of problems, the participants agreed that they were facing the following set of problems in the organic sector:

- a. Quick money (short term economic gain versus long term sustainability benefits)
- b. Displacement/marginalisation of sustainability knowledge and values (lay knowledge versus scientific knowledge)
- c. Implementation (theory versus practice)
- d. Inappropriate training (conventional training and messages versus sustainable agriculture training and messages; low quality of organic facilitators versus the need for competent ones)
- e. Lack of linkages in the organic sector (individualism versus collective action)
- f. Reflection-practice disconnect

1. Thanks, yes, we want to get back to choosing problems to work on. We will not be able to manage the seven [problems/contradictions]. So I am going to ask you [each individual] to choose one. So you write it down on the piece of paper, just the number.
2. What the numbers of the problems that ...?
3. That you want us to work on.
4. What number? We must just write the number?
5. Yes, the number out of these seven [referring to the problems/contradictions].
6. The number and the name?
7. No just the number.

(The facilitator collects papers from participants who selected one issue each that the workshop should work on)

8. Okay there are a lot of twos here. There is one there is two, two, two... Did you read up to the bottom? [Referring all the seven problems because the ones which were selected happened to be at or near the top] Aah, there is a five and a one. [The problems that are chosen in descending order of importance are (a) Displacement of sustainability knowledge and values (b) Quick money; and (c) Poor linkages in the organic sector].
9. We did not go that far!!![They all laugh].
10. It is quite interesting.
11. I think two looks more encompassing.
12. There is one here and there are five twos. So, I think we can work on three problems over the next two days [Referring to issues 1, 2 and 5].
13. Is that for tomorrow?
14. The original plan was that we would have begun analysing the problems today in terms of causes effects and conditions of the problems then tomorrow we were suppose to work on solutions. But we have spent a lot of profitable time on just getting clarity on what we are talking about, which is very important. So I think we will stop here and then tomorrow we will do both developing ...

15. You guys have been flying up there at policy but down here there are things that we can do, things we can connect with. We can achieve something, for sure.
16. I think it is very important.
17. I hope we can get to that point by Thursday.
18. But, I think this methodology, we all gonna take it forward into our organisations. I think it is a very valuable ...It's great. I hope everybody stays for lunch, there is lunch prepared.
19. Okay, thank you very much I hope you will be able to come again tomorrow.
20. Are you coming tomorrow?
21. What is for lunch tomorrow? [laughter]
22. Sustainable food!!!
23. We need you. You are our link to government.
24. I am not sure, I was under the impression that I could come for a day.
25. Yaa, that is true, you do not have to come...
26. But it would be nice for you to come because of continuity.
27. You should come because you will be our link to government.
28. You will have to dress me, petrol me ...
29. Okay tell you what ...

Part 2

The day began with participants introducing themselves because some of them were attending the workshop for the first time.

30. I assist the community, in the development of projects at the moment in Durban but I will be going further beyond Durban in the near future.
31. I am Tichaona and I work for SADC. I work for a regional and international educational programme and this is a SADC programme that works with WESSA ... I think from my attendance of this workshop yesterday there was a call for networking within the organic sector and it is a group that we hope to work with as a programme, which we hope to participate in. And I have brought some brochures so that you can find out more about SADC Regional Environmental Education Programme and how we work with others. Thank you.
32. My name is Robison Zimuto and I work with HEIFA international organisation as a Regional Director in Southern Africa. Our organisation works with small holder farmers. We provide livestock and in turn the farmers also became donors by passing on a first female offspring to other communities. We also provide training and some other related assistance. So I am here to learn more about the organic system and seek networking as well. Thank you.
33. I am Rogan a photographer and I think like anyone I am becoming more and more educated on organic...I have come here to learn and hopefully to get some work out of what you guys are doing, and tell your stories.
34. I am Brett and I am a farmer I both do training and development in the organic sector. I do it as a life choice.
35. Okay thanks Brett. Yaa, you [nodding at the next participant].
36. I am Lucy I am here with Rogan And as Rogan said, we are interested in organic farming and we are here to learn and to see how you guys are working. Yaa that is about it.
37. I am Eva. Brett is my husband, Doris is my sister. Everything that they have said applies to me. My sister and I are largely responsible for marketing and retailing stuff.

We have to, however, basically do everything, including doing farming. We look for stock nationally and we have developed into an international, more global market... Here we are an example to many on how to market but the company that supplies us is a great example to us because they are much bigger than us and they started much the same time as we did. One guy with intent started small and grew big and that is basically where the two of us come in and we work very much as a team. We all need each other and we also work that way very well. We luckily have our accounting staff as also part of our family but we have to develop ...

38. My husband.[laughter]

39. Yes, Doris' husband. He is an auditor. We are very lucky that we have every component that we need to grow successful business. It has definitely been a process of going from small to big, and growing into all your areas of different expertise. We certainly did not learn it at varsity. Sorry Mutizwa but we didn't [laughter]. We learnt from the ground up. We learnt through mistakes ... But also at the same time Earth Mother Organic is a very good example of each person responsible for their section. So if there is something wrong in that section, there is only one person responsible ... Because in the beginning we did everything until we realised that you can't do everything yourself. So yaa, that's us.

Tape recorder break as a new tape has to be inserted. In the part that was recorded, the group negotiates which problem to work on at the instigation of the facilitator, who felt that even though the number two learning and developmental problem was the most favoured, it was probably not one that the group could tackle at that stage. That conversation resulted in the choosing of the number five developmental problem/contradiction on the need for linkages in the organic sector.

40. So what geographical coverage are we looking at?

41. I think that we should look at Natal rather than at national level.

42. What is the opinion of others?

43. I think if we can take it down to Durban, be area specific, just that ... because this area is fragmented. Why is it fragmented? What are the points of fragmentation?

44. I think we will all have a lot more to contribute to Durban specifically.

45. Durban, okay, good.

46. You should speak for yourself Brett. [Laughter].

47. I think that is quite helpful to have that geographical boundary.

48. I work in a regional context and if you do not mind, I will add a regional dimension in that context.

49. Yaa, I am with you. [laughter]

50. Why I said Durban is so that we can identify the small little ...

51. The real.

52. You know, the place, what are the exact problems we face? And then we can extend that.

53. There are sort of big discussions around big politics and sub-politics and the argument is that the sub-politics which is what happens at local level, the alternatives that are taking place at local level are supposed to move up and inform the processes of globalization rather than the other way which is quite dominant today.

54. Well the first problem as far as this whole thing is concerned is already today there are 2 people who are involved in the organic business that are not here because of personal this, financial this and that. I think this is the starting point as far as fragmentation and

the linkage problem as far as organic is concerned. It has lost its original purpose of creating unity and bringing back the lay knowledge and bringing back old principles we started [that] with and it has become a little bit financially based and a little bit egotistical, a lot actually.

55. In the Durban context it is actually interesting how the municipality is looking at this organic agriculture and Permaculture. It is quite amazing. The kind of projects they are implementing you could see that they are not relying on provincial government to help them. They go to this sustainable agriculture because it is environmentally friendly, that is the approach. If you talk to provincial department of agriculture, they hand out chemical fertilizers and seed bags and terminator seeds. They have kind of completely different mindset. So, depending on where you go, and if you go to provincial government, then the organics will fail because of the attitude of the regional department. If you focus on Durban, I think you see it succeeding in the next couple of years because the guys there have really woken up to what it is all about.
56. I agree with you most from our point of view with Earth Mother Organic doing the section of work that I do mainly delivering vegetables from different places. The reason why it works is that we are dealing with small-scale farmers directly, they like to see your face they are much more small-scale and when you introduce to them they have a point of reference and immediately they are keen to do something. I have found out that once you start to move to things like computers and any of that you lose them because they are not interested in that. They are interested in you coming and buying their stock and our department is concerned with what is working because we have been doing it for a long time, going to the farmers buy their stock selling and buying again the next time. That is working and once one takes a small model and now we have actually expanded our field of where we drive to further afield into areas we can take our tracks feasibly, financially viable. We can expand that working model to a slightly bigger area and when that thing expands into something bigger then we can take it even bigger because there we would have actually grown into the whole experience of networking farmers.

Part 3

This focuses on how research participants constructed a shared vision in relation to the common issue identified around linkages and networking and is a continuation from the above conversation.

57. Thank you maybe we can start with the end in mind. What is it that we want to move towards? Which is this question, I was thinking maybe we could chat in pairs and draft something that we have in mind as the kind of things we want to see, as desirable solution as far as linkages in the sector are concerned.
58. When we started I did not think that it was a great opportunity in networking and we see that many people are actually really interested in doing that. It would absolutely be a good idea to invite the agricultural experts. This is the first one of its kind and Mutizwa has been working very hard at it.
59. Next time we will connect [with them] it is very amazing how things have developed over the last two days. People are really interested in developing so certainly we are going to move into the agricultural department I think it will be very interesting for them.
60. I think I might accept also a bit of responsibility for their not being there.

61. I think what we have been going by is starting where there is interest and then build gradually from there. For example, in Zimbabwe we did have representation from government but there was only one person from agricultural extension system. In Lesotho it was different we had four people from the district agricultural extension system and it was there because they had a particular interest in what was going on and they are still trying to link with NGOs and talk the same language with farmers. So there was a specific need state that had been created but I think at this stage it is not yet there, here. The organic sector itself has not talked to each other enough. It is probably important to start from there ... I think this is fine still it is a good starting point. There is a good logic to it.
62. It also takes a particular study. We all had Mutizwa interview us six months ago.
63. It is actually about 11 months ago.
64. The study is specifically focused on Earth Mother Organic and its suppliers. We found out that those who got through the training process, none of them, none of them are producing so for that reason we have reached a fundamental decision not to be too involved with the existing status quo. We could actually work with those without pre-formed ideas as to why it is not working and really break the path because I found that organisations tend to defend the position that exists. Therefore, they offer a lot of resistance to new ideas. So that was part of my agenda as well with regards to government representation.
65. I think definitely the next stage will be to involve them.
66. Don't tell us that the next stage is 11 months away.
67. That will be up to you.
68. So the suggestion was that you discuss with the person sitting next to you about the kind of vision you have.

About 5 minutes later

69. Basically we have Earth Mother Organic as an established retail store and it is recognised also as a place of reference where people, the public and the market sector we catering for that can afford. We can meet and see something solid and it is a forum to actually sell organic produce. And it can be a model for other things. That gives Rogan role use in media, something that he can promote and speak about. He can communicate with a larger public in the context of his work pushing it farther afield. He can actually get to a lot of people through his newspaper articles. For a business such as ours to get to the different farmers if they contacted us or say business people are doing things we can go out there and buy from those farmer groups. So their position in our context is to make us aware of which farmers are doing what and then we will go out and we have someone like Rehini who is a vital link because she provides the language skills because when we go out meet the farmers I do not speak Zulu. So we establish a link between the farmers and ourselves where she is an open communication channel between the farmers and ourselves.
70. That links the agricultural production and distribution chain, right from the farmer to the consumer.
71. It is a really interesting thing that we actually did a radio programme on Radio South Africa and the listening power and education that can happen in a little programme. It is enormous because people say they heard me in Cape Town, Johannesburg and everywhere and that was a 10 minute conversation our vegan organic cafe. So getting media involved is very important for linking up the customer and re-educating them about organic and conventional agriculture and what is happening.
72. Thank you very much. Can we have your input? [addressing another participant]

73. We need a vision to establish a platform of who are interested in practising organic farming to share information which enhances the farming practice. So this platform needs to be for people who are meeting each other regularly learning from each other to do better in what they do, communicate their practice rightly and I think it is linking the media that has just said here. So I think that regular meeting and learning is very important if the sector is to develop.
74. Thank you, I will just write „*A platform to engage regularly to learn farming and act together*“.
75. What we have come up with is that there is a need for an organic farmers' network ... This will not be just the small growers association but will also include middle farmers who are in the rural areas as they can have a central point where you can access and they can sell from there. We are not cutting on out the vegetable grower's little market space for these people to bring their wares. Municipality can give them permission to get up there free markets but they are not linked to the formal. Then they can get support in education and training from fellow farmers, and also from the municipality mentorship such as the old agricultural forum. There is one in Durban. It is mostly for officials and development practitioners.
76. Thank you. I do not know if I captured it well. I think there are two additional points: We need this chain from the farmer to the consumer. We need some kind of talking to each other. But we are also hearing is that we need horizontal linkages, like farmer to farmer kind of collaboration
77. Definitely, yes, yes.
78. So that is the additional dimension. Then the other one which is quite specific in farmers again I think it goes together with horizontal collaboration farmers having mechanisms that help collect and keep produce somewhere, where it can be accessible.
79. But you know what it can be interesting that having established this thing... We have got to know about those two farmers. We have been buying from them for a while so we have established the link of trainer to farmer. And going to the buying project, we bought all the beetroot. He phoned me the other day and said I do not have enough beetroot. So they are already doing it but the reason why they did not do it before is that they did not have a reason because nobody is going to buy the product. But now that there is some buying of the product, this kind of process happens naturally.
80. It tends to be one of the major issues is a simple logistics.
81. And demand. There is demand but the logistics of actually getting the produce from the farmer to the market, that simple logistical is the major issue as well.
82. ...In our experience a lot of people have tried to establish cooperative system, which will be fantastic. How many times have we been excited about this, and we wait months for this thing to establish and not one has happened ...
83. But if you have to set up the structures to have that you got have to people who buy into that.
84. Yes, we will go to the details of who should be doing what. I have just captured one additional point, basically that the *sector should stimulate interest and enhance capacity* so it is not just about networking.
85. I am going to call it Noah's Ark ... It is very important that it has a label. It has got to have a mark recognition mark, Noah's Ark. So it can get government sponsorship and international sponsorship because it is up there and what Noah's Ark does it has its 10 farms in Durban. They only work in Durban. They teach them how to grow and not only that they also teach them home gardening and they do rotation of crops. So not every farmer is growing everything from that point there is only one person who goes

- on a weekly basis and collects from farmer A, B, C etc. Noah's Ark will buy cash from each of those 10 farmers and give them money right away and not at the end of the month... That person from Noah's Ark, he goes to the market in Durban, a market that has already been established. There are hundreds of small businesses that buy vegetables at the Durban market. To spread things too much, people do not like to travel. They want to go to one place. So you have got these little groceries and their organic section that is established at the market that people know if you want to go there it costs more. Of course it does because it is the whole value of a store and it is sold at a profit to Moses. Then he brings back the profit to Noah's ark and they use it for whatever. The same as the retailer buys and sells and get a profit. And people have got to know what fair trade is. They got to understand that it supports communities, schools. Apparently Buzzio has got a proposal like this that was proposed to...
86. Basically what happened is that the provincial department of agriculture and economic development funded a two day workshop in the Valley of a Thousand Hills and the whole organic sector was there. We got terribly excited and we dashed off. We drew up a proposal for how we could set up this Noah's ark similar-type entity and it was not a lot of money. ... The proposal got tossed around a bit and we actually realised what happened was that the provincial departments were not interested in organics. But now and again, they tossed it out to keep them happy. Write a report to tell us how they are doing and 2-3 three years later, we tell the world that we are lagging behind the rest of the world. They throw another bone. So the lesson learnt from this is, let's not rely on government. We can take this proposal and customize it and then we commercialise it and then you do not even rely on government. In fact you only pull in government to say this are emerging farmers so they need your help with funds in irrigation and let them do what they do best. Government is useless at actually organising commercial entities like this.
87. This is what we are already doing. We are getting stock but the label is not Noah's Ark, it is Earth Mother Organic. We do not have a big accounting system because of money. But we have got 3 main farmers apart from all other little farmers that we have. We are already doing the cash exchange story and that is working already. It is very small but it is working.
88. I think the fundamental point that Buzzio has been brought up today it that it is a matter of intent. The concept will work as long as we have intent. As long as we rely on an organisation that has low intent to make it succeed, we are blowing up the wrong chimney.
89. But there is money going into agriculture projects.
90. I have been in this industry for over 10 years and it has not progressed.
91. Do you know Govern Arthur?
92. Yes, he is working with Carmen ... Just yesterday we did the speech for the Minister of Agriculture just as a rescue mission really to stop the Minister who is to talk to cabinet today to say this is really where I want to go. They are handing out the seed bags, terminator seeds and chemical fertilizer bags and government developed seeds. Kevin and I have developed a starter kit for Permaculture where there is organic sprays and your organic seeds, a bag of compost, the proper way of doing it sustainably. And we are hoping it got to the Minister yesterday because it was late afternoon.
93. There is a lot of money going into it and that is so encouraging and we are all encouraged. And Buzzio has done a hell lot of work in putting proposals together, working formulas working proposals. There is no political intent, because without political intent it does not go anywhere, it stops literally, like we said, at throwing a

bone at the organic industry to act like they are interested. It is impressive from individual point of view. Wow, we are getting into the government finally now I am making a thing but 10 years is a lot of time to be thrown a bone and people that have been in the organic industry for long enough, we are all coming to the same conclusion: That if it is not privately funded or economically viable or market driven, it is not going to work through government. It is not an option. Government will climb on board when the organic sector makes itself work, and then government will have an interest.

94. I think that is the point that I wanted in the well-being there [referring to the overall vision on the flipchart paper], they want them uplifted. The government has a reason to be working with a movement like organic farming.
95. So it has got to be made attractive for them, the higher the nutrition value of the foods the more one gets paid. ...
96. In Australia they are doing this already those farmers have got a license now to supply to retailers because they know what they are doing. They get paid on their produce based on the vitality index...
97. So the guy with hundreds of sprayed 50 cartons of apples and the guy with a small packet of organic produce get the same money. But at the end of the day money talks so that is what it is all about.
98. It is closer to reality.
99. Can I also say something else about the last story to what the government can achieve in turning us around? Four to five years ago South Africa was where it happened because we still have all the resources. But agriculture is the only economic sector that is going backwards. Why? Because we are not putting money in it. The organics movement in places like Tanzania, Rwanda, Uganda, Kenya and the even the DRC was unheard of. You look at it now the richest country in the world has got the highest number of certified organic farmers. ...South Africa is left behind.
100. Yes they have come from nowhere and just a little bit of government intervention, in fact we have groups of farmers there who are suing some conventional farmers for spraying DDT, because they are organised.
101. Politically motivated and financially motivated, so it can be done.
102. Thank you. The last point was about having a recognised structure or system that drives the movement, so that should be part of our vision.

The shared object of the group which was captured on flipchart is:

*“We want to see a Durban organic sector that: links the agricultural production and distribution chain; has horizontal networks of actors (e.g. among organic farmers, trainers); has a platform to engage regularly to learn, plan and act together; has mechanisms for collecting and keeping produce; stimulates interest and enhances capacity in organic production; has a **recognised structure** that drives the process and holds the system together.”*

Part 4

This part focuses on weak link analysis in the organic sector of Durban

103. There are huge massive thrusts towards organic fruit rather than vegetables. That is fundamental input that I feel is missing with the training we had. That is the two ends to supply chain that needs to be put together to really make it more effective.

104. There is an exciting project at Entumbeni who is funding Umbumbulu and Marshal Permaculture is involved. What they are doing is taking up a hub that will support the 200 emerging farmers in that area, giving them market intelligence.
105. But we are already doing it.
106. But this has got to happen at scale. It is just starting now and we have 200 farmers who can start working with and what is the market demand? These guys have cell phones they will be told when good rains are coming, all the type of stuff that supports them and also the market day to sell or buy. ...
107. Yes there are probably the longest standing Noah's Ark we do know. They have kind of consistently kept ongoing. We have watched so many guys coming that go under.
108. The difference between Newlands and any other training centre is that Newlands are sponsored by the Catholic Church. It is social input and there is motivation there. It is not about political ... it is not about gaining votes over the election, it is not about appearance, looking good. It is the correct intent...
109. Can I interrupt you, can we move forward please? I think we are looking at what kind of linkages are lacking and the basic question was, "Who is not linked to whom?" And Brett said the trainer is not linked to the retailer.
110. Neither is the farmer linked to the retailer. It starts right at the bottom. You know, a few years ago we went to Mrs Makanya. You know they have set up the whole farm. They have hundreds and hundreds of lettuce ready for harvest and no one to fetch them. They had established, they had gotten it and everything was there and when they get to that point of harvest and sale that is where it ended.
111. Any other points?
112. I just want to hear from you Tich, besides the point I want to hear from your point of view because we are coming like from a retail point of view. I would like to know from your point of view, what would you like to see happening? Because everybody is doing good but somewhere things are not working, I mean the Heifer gentleman.
113. Not so many have been exposed to organic farming activities in the province and other countries but from the discussions that I was getting it is quite clear that the extension or government is not linked to any of those to the retailer to the producer, I think it is quite apparent.
114. Government is there.
115. No it is not.
116. Yes it is not and from what I have heard it can play a facilitating or very active role in promoting like what happened in Uganda and other countries.
117. And also outside sponsorship.
118. I attended a workshop and I think it was in 1999 in East London and Methodist church was promoting Permaculture in some villages in which we actually saw after visiting there were so many people from universities and government departments, after visiting the few farmers, the summary which came out of there of course it was a little bit mixed but the underlining ... [inaudible] was that "*Permaculture sustains poverty*". These are people whose mindsets are, the conventional commercial farming where you talk of so much harvest. So from that it will be like there was a lot of discouragement. We were representing NGOs and we were ready to go in but we were discouraged so we wanted to help poor farmers to come out of poverty because if this thing just sustains the poverty then why go into it?
119. So like what one needs it is like two sides of the story like a forum where you have got the conventional and the organic.

120. But what they saw was a reality because Permaculture, if not implemented properly, if the organic sector has not got its house in order like this ... then it is discouraging.
121. And these are people well placed to spread the message and they got the wrong message and that is what they are able to spread.
122. But would it not be interesting then to create such a platform like we are doing here? Would it not be interesting to get the experienced organic farmers and the conventional ones and see the pros and cons of each and see how they stand up in front of people such as yourselves who can support and have influence then you can make up your minds. Since we don't have the government behind us, we have to stand up for ourselves.
123. Yes I think we need the success stories to be properly documented and also distributed so that if one wants to see what is happening you know where to go you know whom to call. And also I think when we do that analysis. People are very much interested in what makes money. You can argue on a unit, input or an area in terms of land because you are arguing with a well advanced system of conventional farming. This is where, I think, the weakness lies like I did not know that there is such a place around. [referring to the garden in which we were holding the workshop] I only saw a television article a student who was studying Permaculture and my first question to Brett was _Are you the student whom I heard about?' You know that is the only piece I heard about organic farming.
124. So there is more need for media that goes into this kind of editions and not so much the Sunday Times...we actually need hardcore media people that kind of literature you all read. There needs to be more exposure from the media in that kind of specified documentation because none of us has got the time to go browsing every single piece unless you have invested interest and that you are too busy. But when it comes to your doorstep ...
125. I think one of the weakest links is nutrition. It basically could help as a means, perhaps as a single most important contributing factor to the growth of organics industry in UK. They target the house wives and young mothers, sensitize them to health issues. And they say we are eating healthy food, it is in our children's interest. It is found in the women's magazines and newspapers.
126. It started in a way that is very attractive but where do we get that here? How many people in KZN would know that what he is saying that organic products are so nutritious compared to inorganic? People do not know.
127. That is the linkage that we need to make between the producer and the consumer.
128. A good forum would actually go a long way ...
129. It is to package your messages when you link you are getting something to another point of linkage. That message is what is very important as he is saying like nutrition. The value of organic products is in the nutrition.
130. It is money-wise, nutrition-wise absolutely everything as we were saying one organic orange is equivalent to eight pockets of conventional oranges. So actually nutritionally, nutritionally you should be paying that one orange the same amount that you will be paying for those eight pockets.
131. People do not know they need to be educated.
132. You have got to know where these people are and one place to establish is schools because that is where the mothers are. If you went to schools and did a big promotional thing where people with something to say like any of us are doing it in churches.
133. So the linkage there would be between organic industries and education.

134. And perhaps shopping centres if some were progressive enough to say on this day we all have a forum for organics please come and we can talk housewives and mothers, ourselves.
135. How about east coast radios because we are talking here and are targeting Durban.
136. We would need a couple of black-oriented radio stations.
137. I think there is a bit of frustration here with the process because the process is kind of holding us back from talking about solutions. We have this vision in a sense it captures the kind of things we want but before we get there we are saying let us analyse the situation where we are first and then talk about solutions so what is happening now you remember yesterday some of you were not here yesterday but we talked about [refers to the 4-step solution development process by Seppänen].
138. So it is a link to human health and soil health.
139. It is a huge link it is a wake-up call if they realise what they doing, the environmental damage and one can also say it is climate change and peak oil and all that. Conventional farming fosters climate change. And everyone is trying to mitigate, trying to adapt to this climate change and should realise that organics help. So there is a link between the environment and organic farming.
140. And also NGOs are not linked to both the producers and consumers.
141. Not enough education.
142. I think another linkage that is missing is between the people that have the cultural information and the people that do not have the information in other words, the young people and those specifically over fifty who live in rural areas and remember how the old ways were practised successfully and the people of this generation who have not been exposed to organic farming or sustainable agriculture. If you take a person no matter which culture you think about in South Africa if you look 50 years back everybody was growing vegetables in the backyard. It was a common thing and when you speak about ..., people remember what their taste ... when they picked their fresh produce that was a tangible link. But the linkage is missing that linkage altogether [among youth] that never been exposed to it... So I think the link that is needed is between those that have experience and those that haven't. It is important to look at as well.
143. Okay thanks, I have noted that. Any other linkages that is still missing? Yes Tich.
144. I think another link which I see as very important for local action and elevating what we are trying to achieve is the link with these movements that promote things. Let us take for example the Nelson Mandela hype, it is a bit commercialised by some people, hijacked but things that move by such popular movements they seem to reach a destination very quickly and it is effective. So we need that kind of a forum to reach out to these movements who communicate inspiration and things like that.
145. Like a figurehead?
146. In this case 'Zuma goes organic!' would be good work for us. [laughter]
147. We are talking of advocacy. It is about a champion.
148. Because a name like Mandela, trusted, brings forth everything.
149. This also comes back to what we originally said about having a label or stamp, a symbol.
150. Is there a song like 'Bring my Hoe?' [laughter] [Zuma is the President of the country and one of his favourite songs is Muchini wami, meaning '(bring) my machine gun']
151. One last point if you have got.
152. I was just thinking to link this with environmental education.
153. And also just plain simple infrastructures like cars that go fetch and bring stuff.

154. Producer and retailer.
155. No, it is just transport its infrastructure to move this stuff.
156. Yes, what are we linking, what two points are we trying to link by doing that?
157. The people in commercial that cannot walk to us.
158. But I think there is a chain though linked to transporters.
159. Yes, I agree there are transporters between farmers and retailers. There is one difficult and general question that would be very important to discuss which is why these linkages are not there especially between different people. Why is it that there are no linkages or inadequate or ineffective?
160. I think I have an opinion on that, in our society... [inaudible] money-oriented there is a lot a work to be done. Like a vegetable to make money the supply chain should not be that long. It is a very high turnover very low profit margin type of product. So there is no space to pay for the education, the trainer, the facilitator, the retailer, the logistics and everything, all from the price of that cabbage. So there is a problem that what we are trying to achieve actually does not have the potential within itself to make it economically viable to do the whole chain. So if we move from a capitalist-oriented view exercise and put it in a social exercise. The reason why we try and do it is to try to uplift the organic industry. Many people in the organic industry are hardly capable of how you capitalise on what you are putting in, like it is a difficult industry to make money and there is a lot of things that need to be done. It requires a lot of funding at this point that is the main thing. It is heavily funding-reliant. There is a massive input to get any of these things together and it takes a lot of money. Who stands responsible for the bill? And I think that is why a place like Uganda, the government is ready to loan people resources to do it. So if there is low intent on the part of government, it incredibly difficult for this industry to get off the ground.
161. I think there is also communication breakdown. We do not understand each other, there are cultural barriers. We are trying to teach people or show people what they have been doing for hundreds of years already. And we are trying to show them systems that do not apply to the way they see things on the ground. We need to listen more... Also when I find working with farmers with actual people and when money comes personality differences get in the way it is very hampering to the process of buying so what I have actually found is that the less that one brings them together as a group the better. Supporting them as individuals is better than linking them as a group. People are not ready, not yet there ... Jealousies come in it and it is one of the biggest stumbling blocks.
162. I think I agree with you, with that point. I was a bit nervous yesterday when we were talking about promoting cooperatives. In many places they have not worked. I think people have been used to working on their own and what could bring them together is a network around an interest but the production process really, if supported at individual level, it's more successful that way.
163. Is it not self sustainable [referring to cooperatives]. Individuals, you are teaching people to be individually powerful.
164. And you have got some who do better and some who do worse we have seen that at the Umbumbulu project, it was so tragic for us. They were doing well the whole cooperative thing ... then one got awarded agricultural prize, money and others got jealousy, then boom, no more production. It was terrible and I see that with farmers we are working with now. They do not like each other. They told us... We know that they have this conflict. This is our first experience. We immediately gave him [one of the successful members of the coop] this crop. We have already done contract farming

- that one is phoning me and telling me that and he is now networking with someone else like I have said earlier on. The other phoned me earlier on the other one's phone and asked what was going on. The system is already working its tiny but it's working. We are only going to this farm and you must all bring we would have had a big problem from the onset because they are both doing spinach, beetroot and other things and they are already arguing before we even arrive with money. Now you can imagine what will happen once we come in now with the money. It is much better to keep it separate.
165. Do you know why the system collapsed? It was running so well and all it needed [to collapse] was some government entity Biotechnology unit, a spin-off from a parastatal. They came there and they said we can give your cooperative some funding. We tried to prepare these people and tell that these guys are GMO people. They want your seed here and they have no intention of funding anything. And all they will do is promise you. This caused so much division inside the coop that was running smoothly. That was all it needed, to throw them a bone, let them fight over a bone because they have no intention to give the carcass anyway. Seriously, that is how it happened and that destroyed them.
166. And the whole thing just went. It is terrible.
167. So this is a government corporation you could say ...
168. How can we link that to where we are? The study indicates that there is a lack of solid infrastructure because you say it was working running smoothly but all it took was one shudder for it to fall to pieces. I think the core reason again is that we need those examples and success stories. There aren't examples or success stories. So part of the solution is identifying where we are. Whenever there is a transformation it is important to identify what part of the cycle we are at. It's like a butterfly you are in the cocoon stage or in the larval stage you know whether you ready to share it. As an organic industry we are not ready to share it. It is in the egg stage and if we do not acknowledge it, if we do not identify that we are at the beginning and building the foundation, if we try and get ahead of ourselves – there is nothing to build on. Mutizwa has to constantly rein us back to stick with the methodology because we consistently want to jump to the solutions and in the organic industry we are so desperate of success. This is a macrocosm of what is happening at this particular workshop. Like those people in Mbumbulu, they were doing well. They needed fundamental foundation support they did not need an idiot to come and dangle a big bone. They just crushed because they were not there yet. I think we really should identify where the linkage problems are right, at the bottom right at the base.
169. What I think would be helpful so that we draw on the wealth experience that is here is for us to look at two real examples of how the issue of linkages has manifested itself in real life situations... We could have two groups go and discuss how a particular initiative which suffered from lack of linkages and share that... how an organic farming initiative experienced problems that are linked to linkages.
170. Are these issues being documented?
171. That is what Frank from Newland said we do not have to reinvent the wheel.
172. But that is what we do over and over.
173. Brilliant. This has been good for all of us because I now see many more opportunities but one of the big learning processes is that I have already started it in a very small scale. I am excited because I have made connections with people. I can take this concept further. It is really working but in a small way unless I had already established that link myself. I would not recognise my opportunity and that is what I find that we

actually need working models with which we associate. We just want work isolated and keep on doing the same thing over and over again and we do not see any context of the bigger picture and then some of us are much more ahead and have more vision and have a tendency to get big too quickly and the rest of us cannot catch up because that thing grows fast ... There is no support from the government, which is what gives the edge. This kind of forum is what we need to connect but have we got the eyes to see?

174. Okay thanks.

Part 5

Participants break in two groups to discuss solutions to the linkages problem that they were facing before reconvening in the plenary. The conversation below captures the presentation and discussion of model solutions.

175. How did your discussions go?

176. As far as the solutions are concerned. There is already an organisation that is working that is already doing it on a small scale. So we thought as follows to the solution. Earth Mother Organic goes, there or, it is the label working together with that organisation and has the central point, subsidiary office where one guy is responsible and let us say, at this point, 20 farms. At that collection point he will pay cash but he will have personal relationships with the farms that have been established and will pay cash but it is not the same guy who is doing the crop rotations and doing the growing ... We have experts in each compartment. From there we have different sections, for example, at the central point we would have a consumer market, where you can sell organic vegetables, which we are already doing as Earth Mother and plus any other additional things that we might work with if you have made bread you bring bread and we establish a food organic market at that central point. And then from there, to have wholesale market as well, at that same central point. You come with your wares on the Wednesday, we have the wholesale organic market where you can continue to sell once it is grown and is running and working. You can sell to all the health food shops that are not going to buy a hundred cabbages as we do. They only need 10 of this and 10 of this so you are creating not only the consumer market, which we already have. And people come to the wholesale market. But one needs funding either from fair trade Hand in Hand or from government funding ... Africa, nothing, it is the poorest continent so funding will be the key to that because all of these people we feel need to be paid. The guy who is looking after the farm the guy who is fetching the things from the farms and all the logistical things in between because they too need to make a living to pay their bills, lights and water and if they do not have that it falls flat it is not sustainable. Everybody needs to earn money. I think in a short amount of time because there is a lot of network already established, people already know stuff, I think with the correct management it can be a profitable organisation ...

177. And I think that will be like a place for exchanging products and bringing them with the people that do the training would step in. They could carry on mentoring the farmers to see that they are still sticking to the organic roots and not become corrupted by any other influences and if such happens, they would alarm the retailer or wholesaler about the situation so that they become aware of that fact and thereby control it, its label.

178. Comments from the other group? Yes, Tich.

179. Yes my comment has to do with that chain, sustaining that chain. We have different farmers producing and we want somebody who is also collecting the products from different farmers and then bringing them to the retailer. My question is should it only be the retailer who pays for that or these people who are also contributing the products which is being collected by somebody? They also need to make a contribution because they also have a stake without this person collecting they are not going to get income so each must contribute because they are benefiting at the end of the day from that chain.
180. It is right because like I said we were buying stock up R1,500 from that lady so over a month it was like R5,000 rand on one little farm. Some of that, yes could be used to contribute as a percentage that goes back to pay the transport. Yes I agree with you that there should be some incentive for the person that is driving the car...
181. Or if we put all of the costs and all of that in the mark up we put on vegetables, so the vegetable price is determined by the cost of the table, the market fees, the car, the person that grows and so on. Where we have losses or arrive at a farm which happened at Umbumbulu and we came with R430 worth of stock it is a loss a dead loss but we have to do that kind of work because in the end we are encouraging farmers to grow and come to us. So we have learnt a very valuable lesson. That it is how we price it... it's worked into the price of the consumer pays for the end product. But there would be a solution to the way of doing that is that the guy who goes and collects but it is got to be limited. Again he has to be monitored. For example he buys spinach for R2 and he can sell the spinach for R3 and therefore make his money by visiting more and more farms and making sure that he gets so much stock that he gets his R500 but that is just the way of putting an incentive. Then that would be his salary it would be a way of his effort being covered.
182. If he was not independent.
183. You get more money if you are independent.
184. That is what I have actually seen that for it to work there would have to be a percentage structure on produce. As it comes in it does not matter what the value of it is, the value chain has to put a percentage so that there is a clear outline as to what percentage each thing is. So like Rona said, if the producer or anybody in the chain can identify that well I would be prepared to do a bit extra because then I will get my percentage for that so that is set clearly at the coop, I know the coop is a horrible word, but my concern is that not again a cooperative structure has personality problems again the organisation problems and again if it is correctly managed and there is a history of terrible management from government management right down the ground. So far the fantastic concept has been tried over and over again. What is going to make this more workable than what has failed over and over again? With Eva driving to go and fetch vegetables the supply chain is short that is why it is working.
185. That is what my original thing was that if that you have got one guy who does it so one person just got paid and from the profits that are made from these things should be sustainable. I know that is profitable... But the thing is if we start it small like it was and then grows into something bigger then there is also money to be put into expanding it so it is not got to be me only visiting them with Rehini going out. She will go out with staff and start managing a fleet where people will be working for us and say I am interested in this organic farming. I know that we have got to ensure that farmers are kept happy and whatever but we have already been doing it on a small scale. So when it grows bigger we have got the experience that we can be translated. Then because it is our business we have been in it for a long time and we have a good

- name and we do not to take that name by corrupting it with inorganic stuff. So we gonna stay true to our origins. She will then start managing two trucks with drivers she had already done it herself and so she knows exactly what need to be done there is already a set perimeter in place of hard works. Those two drivers will start going out you will have to go through the pains of hiring staff and whatever. There is no quick fix.
186. What we are saying is that individuals such as ourselves are going to be responsible for establishing infrastructures.
187. So the individuals such as yourself, you not an individual you are a retailer.
188. I was talking about us as a group.
189. So the cooperative and there is no space in this delivery for a third part. There is a direct link between producer and retailer that is the thing. That is what I feel is coming out of this. The thought, the assumption of that there is enough profitability to support a third structure in the supply chain is a false assumption.
190. I do not think it is a false at all, Brett.
191. Can we do that because some of you need to be leaving soon and I think this we be a very useful discussion to continue tomorrow to interrogate further the solutions that we are in the process of developing, I would also want to hear what the other group has come up with before we take a break for lunch.
192. There is definitely the need for a forum amongst retailers, I think we identified from our side that the problem of linkages comes because of the lack of a forum, a lack of networking.
193. Not only retailers but growers as well.
194. Everybody, it covers lack of linkages between producer and retailer, between the vegetables and the market, a lack of forum, a lack of networking between these people. We identified that identifying tangible goals and processes especially a common need between the producers and retailers is definitely a way of sorting out these linkages. But the real issue at this point is a tangible forum. We discussed also about funding who is going to fund them this forum. And through our discussions and such inputs from SADC we realised that there is no funding that will come and initiate a forum. There is nobody who is going to come and say that you do this and you do that. It is the individuals within the industry that have to use our own initiative to actually come together as a forum and create this example of a workable solution that will then attract the funder. Similar with what Eva is doing with this delivery chain problem by actually doing it on a very small-scale farm and going there and doing it with one's own initiative because that did work from a small scale that has then the potential to grow and then escalate and attract funders because funders do not have money to put in intangible things... The valuable thing that happened is if the funder comes in and supports a cooperative what is it they trying to get out of it? Because they have got to have a reason for going there – a common ground. If their reason there is to see genetically modified farming systems and things like that and yes they got to help you set your organic cooperative so they can hijack in five years time actually there is no common ground there. So it is through this forum that we need to identify the common ground consolidating working principles and then allowing that introduction of funding in order to evolve and stop heading for the big and expect it to filter down, actually start recognising the value of what we do. What also came from our discussion was recognising the need for knowledge, for actual hands-on approach. We use the example of me not having a degree in agriculture and having a lot to offer.

- How does one recognise that and actually acknowledge that lay knowledge and place a value on it?
- 195.No, because basically we have a baby.
- 196.The general thrust of that is for the grassroots small groups getting together right at the bottom of the chain and building up.
- 197.Yes because basically we have got a baby the organic industry is a baby, and we are expecting it to be a varsity professor, that is not going to happen it has got to start from grade 1 and it is going to have its experiences. It is going to have its cut and bruises and this is what we are going through now. To reach some kind of maturity and small and expanding is the answer to all of the problems and it is going to give all of the solutions in time.
- 198.Growing it organically.
- 199.Thank you very much Group 2. Is that pretty all?
- 200.Just to add here I think for the forum to work the individuals within the forum need to find a common need which is going to be satisfied through coming together in a forum. So if we are going to say let us meet two hours a week you need to say that two hours that I am investing in a forum is going to benefit me this way and I am also going to benefit the forum that way. So that a common goal needs to be found so each of the potential members of the forum need to say I have identified a need for us to come together. Therefore we are going to come together and make things work. So nobody is going to come from outside and say guys there is some funding that can help you to come together and share together and share ideas has to be intrinsic. We have also a need to come to this forum and if we all come with intrinsic needs then we are not going to be able to say hey I am going to spent two hours every week in a meeting how is it benefiting me, you already know the benefits because you have done analysis that we need to meet if we are not going to the meeting and coming together with one voice then we are going to lose.
- 201.So in short what are we going to do?
- 202.I think if I must be a member of that forum I need to say this is my need which is going to be satisfied.
- 203.So you are saying we have got to set up a forum?
- 204.Yes that is the solution but most importantly the people that are coming together to set up a forum before they join that forum they must do a self analysis and indentify, have a very clear understanding of what is it they are hoping to get out of it.
205. Intent?
- 206.Yes, they must have intent because as a forum, they must have a goal. Because a forum, the danger of a forum, especially a funded forum, is you get together and work something out together but when you come apart or when the funding is withdrawn and there was actually no substance which brought you there and there is no substance to keep you there. So it makes that forum unsustainable, so we are saying an integral part of creating that forum is that these individuals have very clear goals how am I going to make this worthy my time...
- 207.The only way that the forum will continue if it is results-driven. After we leave this table we actually have got to do what we say we got to do. We need to network we got speak to the people we have met to establish some kind of continuous contact after this process because sometimes it stays on the desk and that is for example like me who is action-driven person. I am not talking in the context of this workshop but some that I have attended before. They lose their drawing power because nothing happens afterwards. There should be a continuum and a follow up. Maybe that will require

someone like you [referring to the facilitator] who managed to facilitate something like this to do follow up. It is up to the individuals ourselves to let this go somewhere because it should be results oriented. If it does not go anywhere I would much rather be at a farm and networking with farmers and organising and the exciting thing that has began than be at such a forum as this or any other that will lose credibility for me because it is a waste of time if nothing came of it.

208. That is an example of, you are aware you have done that self analysis you identified the need for that forum because you have your goal in mind so that sums up what Tich was saying or what we are trying to say with that forum is everybody who has to come to that forum should have a goal in mind they must have of the idea of how they are going to capitalise on the time they are putting in.

Part 6

Participants negotiate on which of the two solutions to take and the turn of the conversation begins with comments by the facilitator.

209. What I seem to be hearing are two related points but potentially contradictory, I think. Your group has an idea of who in terms of the forum. It sounds like it has defined who the forum was going to be made up of and this group is suggesting that we start something new, something afresh. I don't know if I am right.

210. One is at the beginning point and the other has reached the ending point the one has already established the core of the whole system in the working framework, a model that is working and this side is saying the beginning point is way I understand it would be the individuals attending the forum and the areas where we can meet and discuss what issues there are.

211. I agree. I think that group is already assuming that the ground work has been done successfully whereas this group is suggesting we still need to come around the table as a core group of organic developers and develop a work of all scenario develop a workable practice within the context of our experiences that we have made by assuming that we are here like with Umbumbulu getting ahead of oneself like that and say why did it crumble let us go back to the fundamentals, the core fundamentals there in my area as a person that set up a functioning organic farming that they did not have 1 square metre of soil planted with vertiver grass. That is the first thing one does when starting organic farming, the establishment of infrastructure before putting in the crop in the ground. You establish your contours because if you crop in the ground you need irrigation and to irrigate without contours, that means it would not be sustainable farming. That is basically how I see these contradictions.

212. I just want to share something the discussion I had with the friend of mine and Zimbabwean farmer who lost everything ... He says that the amount of resources that South Africa has is just overwhelming. We have irrigation schemes, pipes in the ground and fields which are standing there empty, and fields of weed. He says there is so much pontificating. We are not putting the seed in the ground.

213. I was actually gonna say that in terms of this group of people getting together, you have got to say, right, I am going to phone these people to come to this forum. You need step one...

214. We have not seen a lot of success stories but some of the small successes I have seen is often being driven by the fact that somebody has gone to a seedling company pulled plants out of the trays put them in the plastic bags and drop them off and say if we

- don't plant them in the next 24 hours, they will die. Boy, three months later you have got vegetables and it comes to that ridiculous simplicity.
215. So what seed do we want put in the ground here? I suppose that is the question.
216. For me it is the importance of momentum because what I found with the few workshops that I have attended we have left with a lot of excitement at the workshop but who goes then afterwards and makes the call? Who encourages consistent networking? Because again if we take, I think the thrust of this workshop has come out the importance of forum amongst the stakeholders regardless of funding because the funders should be an absolute none issue in sustainable development. They shouldn't be an issue. That is the problem with the organic sector, lots of talking and nothing on the ground.
217. We will definitely make the call and contact Germany project the Hand in Hand project that we are already in contact with. That is one step we will do and Buzzio will then present the plan. I will speak to those who are already training people that have got some working farms where there is so much innovation. Whether they have mulch or vertiver, I really, it doesn't bother me, as long as they have got stock I network with those farmers, to see if we can set up a thing so that we can go and buy vegetables. And possibly get them some seedlings for the next season.
218. I will continue the effort and found the second Earth Mother Organic that is based out here simply because our key people, our farm, like Buzzio and farmers and a lot of them, the central point is actually happen here. Brett and all the people with the voices and of course we have got a market... I would like to establish another venue that will create a farmers organic market. So just to create more consumer awareness so we will continue to look for a venue hopefully there we can build our foundation and do our meetings there and sort of try and create a central point of meeting and try and establish this thing that we are talking about the Noah's Ark.
219. Who is writing this?
220. It is being tape-recorded.
221. We are on day four already [this was day three].
222. I think that is a happy getting together.
223. Thank you.
224. Thank you. I think what we are arriving at now which is quite important is the kind of organic forum. I do not know what name you are going to give it.
225. Earth Mother Organic.
226. I think that is what we have arrived at as the general solution and maybe tomorrow what we should try and do is to take a step further conceptualise what kind of forum who is going to be there and who is going to do what in order to get it moving. Something concrete. We do not like to leave things just academic.
227. Let us take it perhaps [inaudible] then the actual contact list tomorrow and we can like assess each person in the workshop. Is it going to be Face book, is it by meeting, email, telephone or regular monthly meetings? What are the perimeters we are working with because that is the difficult in forum? What is the platform, what suits everybody how much time do we have? How much time do we need? You know that type of thing. I think that it will be helpful to work with, one of the things to work on tomorrow.
228. Since there are a number of other stakeholders who could not come in, if each of the people who came here could link with another potential member of the forum so that a common interest can keep being identified.

229. So some of the questions related to that are who be part of this forum and why? As a broad framework with which to work so that when we are doing the contact list there is some kind of framework but not an individual as such but a player in the organic sector. What kind of player should be part of this forum and why? What is their potential role and then what steps should be taken by whom in order to move towards that. I think that will help us move towards the vision. Okay thanks very much. See you tomorrow.
230. Energetic interaction.
231. ... Yesterday at the end of our discussion we basically agreed that we should set up an organic forum and we agreed that it would be at district level. We agreed who should part of the forum and what role they would play not only in terms of individuals it can also be groups or something like that and then the next question is what steps should be taken to set up the forum and by whom and if possible also look at the when, when we are supposed to do what. Then if we still have time we can discuss what problems we are likely to face in setting up the forum.
232. We must think of it as a constructive body rather than a loose arrangement. It has to be an entity.
233. It is encouraging not in a negative way because that is achievable. But it's something we can do.
234. That's imperative.
235. The different people we invited, they all see different components of the forum. Let's hope that they came back.
236. That's what we are setting up, it is a vehicle to bring and keep relationships together.
237. And usually initially you need individuals that commit their time and put in it energy to bring people together and think through. If there are no key individuals that do that, that things go back to the way they were before.
238. If there are no key individual, things will go back to what they were before.
239. Maybe what we can do is give each other five minutes to think and then we can share.

[Participants are asked to answer the following three questions, which were put on flip chart: Who should be part of the Durban Organic Forum and why? What steps should be taken to establish the forum, by whom and by when? What problems are we likely to face in setting up the forum?]

After five minutes

240. Okay so who?
241. In my opinion who should be part of the Durban organic forum and why now that we've established the forum. The people I would invite to this forum would be the retailers both from the formal sector and informal sector. A good cross section of them that represent the thing, either heads of the department that's doing the vegetables. Then I would do some of the informal sector maybe someone like me that networks with the whole sector. It is those pivotal people that have access to a whole range of people in their section. Next I would have the farmers represented. I would have both

the emerging farmer who is successful such as some that I've already named. Then I would have the few substance farmers that have potential to grow into a bigger sphere. Then there are now have the trainers and mentors. Then I will have key groups of people, Newlands, Marshal R-land care, a couple of those people. They are movers and shakers within our own Natal province. I wouldn't go national now, I would stick to this.

242. OK that's fine.

243. Take the initiative and do what you feel ...

244. Then I would have the funders if I could get either the people themselves or representatives like those representing them. For example, again Frank from Newlands represents the national funding ... I would get international ones maybe ask ...

245. Just a moment because I think there are two levels of the forum. There are those who are going to be identified as the forum. Then there is another level of friends of the forum in a sense that are going to provide support so at this stage you probably need to separate the two. I was wondering if funders should be inside the forum.

246. I believe that there are because some of them might be the same thing –ok” I'm not saying we bring in ... Doris for example that deals with R-international. They've already sent us things for funding representative of those different things. Frank from Newlands who both represent its training mentorship and international funders. So for the initial of forum. I do believe that one need to have a brainstorming session to get off ground to see where to go, in which direction.

247. Can I present the absent here?

248. Yes.

249. Something that Tich yesterday –yes” about SADC as actually funders their people help make it happen.

250. Speaking from this point of the view as funders it was very important, integral way of operating things, as a funder. They are kept very much off the initial processes because if they believe in it hook, line and sinker and at the end of the day it flops. If you involve them in the initial process then you are stuck, you can't withdraw from it. That's what I think about that. That's why I think I agree with what you said about the two different levels. I think definitely you must have to consider what is and what we achieve in our region. So those stakeholders ... and then on the next level the means to achieve what we want to do but I think we must be very clear entity what we want to do but. The funding would come much quicker when you are clear on your goals as a tight organisation. If you can show a funder how you are affiliated together and working together on your own steam...

251. So I think that I agree that maybe having them is jumping the gun but what I think if one could present modus operandi that of people are results driven is evaluating the needs between these groups because we all need each other. Ideally probably would not need the extra support. We wouldn't need to depend on the funds. The funds would be an added bonus for when we are already doing well and when we can see that these funders would be coming [and asking] so what do you need? We need tractors; we need fencing added for this and that farmer. So the funding is an added bonus for that we would get because we've already achieved what we are doing...

252. So to sum that up as a forum we need to develop a prototype that is not funder orientated.

253. Yes we need it and then to go to the government and then what I gather is there's a lot of money floating around that is totally without orientation that's gonna go to the obvious place go. So now if you in this forum, if you created a modus operandi that is

- efficient this whole thing, if one then approached the government and said right, this is working, like this an initiative we've done it is working. We are selling stuff. The informal sector is selling this the formal sector is selling this. It is working. Would you consider government funding they have a project for these and these things. Would it qualify for government funding? Don't you think that it would be better for the government to fund something? Here we have result.
254. Now you know my opinion, that is, if we set up a successful prototype that you manage to do it okay... what I've written down here is the retailer is the one who must be, the one investing in infrastructure because is this not the prototype that we are trying to setup. If you want to be the person retailing organic produce if you had the market, your whole thing is a success, you gonna find a market. It is quite a fundamental difference in approach. Because the normal trend has been train, produce and once up and going, source a market. And that hasn't worked to date...
255. I'm thinking why is it that we want to involve the government?
256. Can we have Razio please?
257. I sort of just like who the stakeholders are. We must treat it as an industry, this whole, the forum. Taking into consideration all the role players that are related to the organic farming industry. So it is growers, different levels of trainers because you get... I firmly believe that there are different levels of trainers. So we are going to identify one from high up like Buzzio, a person who knows the whole process.
258. And then farmers, small scale emerging farmers and then the very successful ones. So that is an incentive for the small scale farmer that you can move up.
259. You definitely have to have the three levels because there you've got the next generation [of successful farmers] you've got the next people because these things have got to grow to be very big because you need follow ups. Because people are going to fall by the way side. There are things that happen that are unpredictable for example the main driver at the farm has a car accident. We need a follow up so that the whole thing keeps growing.
260. The marketing person someone that has got experience in marketing, and then the retailer, put down there somebody from local government but I don't know. So that we know that government they must not criticise. The next phase will be involved, what's their opinion? Then like the funders, for example, ...but maybe in this group there is someone that's interested in funding and has a vision that incorporates funding, if those of the people would know the point of view of the funder and even the government under the circumstances to have in order to qualify in this funding ... Those of international funder and even what their government under the circumstances what you need in order to qualify for this funding. What is their point of view?
261. I think what you could still do is you could have this core group of the forum whose identity is the forum inviting different stakeholders at the different stages with an input at some stage for example you might want to engage with organic association of South Africa. You want to, so we are not talking about...
262. Universities?
263. Yes.
264. But you will be talking to them while still being yourselves
265. Yes.
266. I understand and once the intent of the people in the core group is clear and from there you moved out to facilitate the meeting of the other peripheral things. So it's basically would work like a circle you've got your main core group at the centre; you retailers, trainers and farmers then you've got your peripheral circle. So you've now

- got your funders, your education bodies, your varsities those kinds of things, then you've your group?
267. Yes I got it.
268. One group that I'm not sure about especially when we are talking about the trainers is when place agricultural extension workers are they in the inside or in the outer circle.
269. I would say that, the thing is that what happened until now ... I think we are looking at a forum with a fresh approach. I find it very interesting that some of the people who were invited came and the people that were invited didn't come. It indicates to me a very opinionated approach and to organic is stumbling block. This forum that we are proposing to create I think dynamic its needs, to be open minded, it needs to be willing to try different things, in order to collaborate the best of everything. So in that first layer [inner circle] I would say that the organic forum need to be a new dynamic to create and approach things in a different manner drawing on the existing structures in a second layer [outer circle] and feeding back into the second layer.
270. That's how I feel about it.
271. Is there any other group that you want to add because we still need to talk about why or what the role of each actor is going to be?
272. I don't buy the idea of getting someone within the [mainstream] agricultural sector, because I think it is too early...
273. I feel that this is something that has got to grow.
274. I feel that from the onset it needs to be kept small so that it can be quick on the feet. It can function fast, yes.
275. Yes. It grows I think we've got the benefit that we have approaching this forum is we have a working model to test things out, yes, we can actually test. If a government organisation wants to test a theory they've got to first train, trainers to train the trainers and you've gonna train the trainers eventually five years later it might produce a group. You know it is such a protracted methodology.
276. We are thinking of bringing in a training entity. Just refer to it how we develop our knowledge and the agricultural side so to have someone who has got that other training, you know conventional agriculture training.
277. I thought you were asking about the government representation, you mean commercial agriculture, farming.
278. Yes, someone who is trained in agriculture, yes.
279. I think that the one that's from my point of view you have to work with different organic farmers and having seen their issues. I think once we have got this we start getting into the retail section and from massive land that stretches from A to B then I would bring a commercial farmer perhaps to be able to teach us and market methods and methods of farming in that land in the context of effectively selling it but the thing is that I don't think we are at this point yet because they gonna come and sure is farmers scientific thing. In America they've got satellite which tells farmers what to plant and when. Some of the farmers even don't get into their land you can see the soil. What I suspect, if we have to invite conventional famers is that they would learn a hell lot from us.
280. I think it would be a two way learning process.
281. Yes, I do I think in a way that they are so established in the commercial line, income-driven.
282. Then it is bottom line income driven. From a body like me it would be interesting to see how they manage that land in order to take a formula that is a quantum leap. And that would translate into our situation knowing what I know.

283. I think what I'm hearing at this stage is as a starting point we want to work with a group of people at various levels along the agricultural production and distribution and marketing chain in terms of organic production.
284. Yes.
285. Then I think once that is established and functioning we can begin to engage and possibly recruit other actors but in the beginning it would be important what we have fairly clear idea, important, that we have as a group of the converted in a sense.
286. Because right now if we had invited any of the conventional guys they would have blown us completely.
287. We would have no credibility because we don't have anything that works. All we have is division amongst everybody we've no common ground all over the place. We've got personalities that are ego-inflated. They do not have the big picture. We've got to get first everybody in our own industry to understand what we need to create. There are so many different satellites of organic they are all working together. When we've got them together – then we will have a united front.
288. I think that should be the next phase.

Part 7

The workshop proceeded to look at criteria for membership, the roles that each of the members of the stakeholders and bring in and benefit from the forum.

289. I think that we must be aware and very conscious of growth for what we doing because like we have to, what we are proposing is very different from how commercial farming. It is fundamental. In our society automatically when we think of growth in this organic straight away you got to have a bigger farm. We gonna be very careful because it doesn't work on bigger farms. It works with more stakeholders like I'm a firm believer in creating not so much an organic agricultural sector. My vision lies more in creating agrarian society and to create an organic sector is to encourage monopolies, domination and abuse and extortion in the same lines as what's going on in a commercial sector now of agriculture now. So I think it's very important that if you gonna look at growth. It goes like hand in hand, you're growing agrarian consciousness you are growing people and families, you are growing communities, you are growing independence. There are things that are not dependent each other.
290. Why would you invite the retailer, retailers would provide the income. The retailer, in a nutshell, is the one who provides the income.
291. For the retailers.
292. It's not viable for nobody at the end of the day.
293. Why would you have the farmer, the farmer would provide product he would provide, he would become independent therefore he would be instrumental in community building because as we've already seen happening because in our example the farmer is getting income from us and we've already bought out one of the crops. He's already exhausted his land and one of the crops we need because and now as I said Eric is a business minded person already otherwise he wouldn't have such a big land. He has now realised that unless we as retailers come in, we've told him what our needs are, he understands our car needs to be full. He can't give us the crop because his already sold out of it to us but now he doesn't want to lose our contracts. So what

- has he done? He phone me the other day and said to me “I know someone else there” so he has naturally formed cooperative with those people I have not got involved in it. He would make an arrangement with them as to the price whatever based on what we worked out from him, so his naturally included the community and he knows where to go. I don’t have to waste any time hunting whatever he is doing he has already phoned me. This is happening in two weeks. And that is so it is community building and his got an independence because even if nobody else is doing anything he still doing something on his land. So he is independent in the sense. He is creating his own money because there’s a demand for his crop, that the retailer is fulfilling bringing income and then the trainers and mentors are we definitely have the trainers and mentors. They fulfil a role of supporting to the farmer. When problems and issues arise there will be somebody. They are now making money from this crop so it is in their interest. It’s in the mentors’ interest that those projects ... The trainers and mentors could come in and try to sort these [problems in the community] out at ground level because they are involved with the people and they know the difference personalities.
294. The training and mentorship should go beyond just showing them how to grow.
295. They should have a control system.
296. Yes, I mean they actually mentor a whole community of people that they working with not just.
297. Because that’s the problem you spend two days or two weeks training a group of people. They go back to their community and they encounter problems when they grow crops and they don’t know how to deal with this worm problem that you didn’t talk about. About trainers and mentors if they would need a formula like this because one thing is missing. We have a lot of trainers but they are very few mentors... These people that are coming now are mentors, the mentors are the ones that are responsible for the follow up support of the farmers. They’ve got a centre within the community. She’s a virus scientist [plant pathologist]; whatever she describes herself that has got a central office within the community. So is there fixed in a place where people can phone. You can drop in and say I’ve got these problems with insects I don’t know what to do about it. At the same time the mentors and trainers also have got an eye on the ground the fact as to everyone is sticking to be the principles and it’s up to them so they’ve thought them the principles to make sure those people are there in control of the organic principles.
298. But should they be taught something about, you know some basic marketing course also trainers and mentors?
299. Yes, we need trainers to know not just about how to plant it, can be a range of trainers so they not just about...
300. But I founded like for example government institution I went to a business management course through some teaching school. It was Damelin now the man that was teaching us was a business man he just had a talent in teaching but he was not a business man. Not everybody that’s a trainer or a mentor is going to have [business] acumen to do that ... Frank has recognised what I’m doing even though I don’t have a marketing degree but we know what we are doing. He has invited me because he doesn’t have that skill. “Come and talk to these people so within a training and mentorship thing”. Maybe one can set up a forum like the doctors obliged to work in a community hospital maybe within a forum all the people need to commit to doing a certain amount of community work that is unpaid whatever that is a supportive thing so you would invite me a retailer to speak in the training. There would be a slot in every training [programme] that I would come in as because this is our forum and I

have committed to certain hours community working a month. It would be allocated to these people who are ready for the training, when can you come to do the explanation on marketing. So that way we would get the people that are successful in whatever area they're in to do specified sections of the training programme and therefore support those trainers.

301. Hallo how are you I'm so thick with names, it is cold.

302. Yes, I'm freezing this is Razio.

303. Didn't we go on that trip together?

304. Yes, yes.

305. This is Mutizwa.

306. Hi.

307. You are also cold Mutizwa.

308. Hi I'm Christopher.

309. Maybe you can explain what's going on here it is exciting

310. Mutizwa can explain more clearly what the study is about. Would you like a cup of tea before we start?

311. I'm just going to get my jacket.

312. Good idea.

313. Sorry Mutizwa for the distraction.

314. We are doing videos with the people who are affected by cancer and one of them has got an unusual manifestation, Kaposi, Sarcoma. This is a kind of cancer on the skin...

315. Okay so we've spent the last three days looking at some of the organic sector in Durban and we are in agreement that there is need for a forum that would work towards addressing a number of issues being faced in the sector and now we are looking the nature of that forum. Where it is going, who is going to be in it and why? And then the steps that would be taken to build that forum and then we will conclude by looking at the problems that are likely to be faced by the forum. So that we are at least aware [of the problems] and we can begin to think of how to mitigate them. Because what we've realised through the process is that there are different groups within the organic industry but they are not working together. What we are establishing here is the context that will bring all these things together realistically now with a results a driven kind of intent. So basically we need all the components of trainers and mentors, the retailers and the farmers both the subsistence and the ones that are doing successfully already. So we are the stage where we are looking at the who. There are four main categories retailers, both formal and informal; and farmers, the emerging is subsistence and those that are successfully already; then there are trainers and mentors at different levels, some are at very local household level and others are cross-cutting. We are looking at production, we looking at marketing so it's along the agriculture production and distribution chain. So these trainers they are not just about producing. Then we also looked at local government. So when you came, arrived, we were talking about some of the reasons why these should be part of forum. Then as we were talking there were also other actors that came in such as government and donors who shouldn't form part of the core forum but they should relate with it. So in short we have a group of farmers, retailers and mentors and local government that would be relate to government and extension workers those that are promoting conventional agriculture, agro-processors and providers. Maybe providers, is too limited [a term].

316. Does that include seedlings or seeds?

317. Yes.

318. So we need a better terminology. So that is infrastructure development then providers of education for these would be universities, communities and so on that are outside the trainers that we are talking about that need to be engaged with, sometimes collaborated with, sometimes challenged. There will be different kinds of relationship with people in the outer circle so that where we are at.
319. And the locality of where this is going to be located?
320. In Durban.
321. Sorry Mutizwa what we established in the last few days since our model with Earth Mother Organic working. We've realised that a core reason for success is that we started very small so what we finding is that a lot of projects and proposal whatever are much too big. So if we got a working formula within our own province. We basically, we don't need that much input we've got a car we are going to drive and we started getting the ball rolling on a small scale thing, once it was working, it is small working example that we can then translate, involve other provinces and communities in the whole lot of South Africa. Basically that is what we found out ... there is so much need for getting something working here and we start with a small thing and slowly expand because my analogy is that we've got a baby, an orphan that needs to be a graduate the organic industry it's a baby its gonna make mistakes if you are small, early on the mistakes aren't really hectic.
322. Are the any existing forums in this that we are dealing with?
323. We don't know, do you know of one?
324. There is a group that I'll be meeting tomorrow which includes gardeners, informal gardeners.
325. Which sector are they? Training sector, mentor sector or are they compassing all these different groups that we've mentioned.
326. In this case we are talking specifically about agriculture a municipality hosted sustainability forum mainly about agriculture about 80% of everybody is involved in Permaculture or small scale.
327. What is that forum called?
328. Sustainability Forum.
329. Where was that held?
330. It held at the ...
331. And it is hosted by whom?
332. The municipality. They've done quite a journey with organic agriculture. They have had a real blotch up with Permaculture three to four years ago and they had lost all faith in it but they have come back to that.
333. We were involved to certain extent with a couple of training groups coming. We had experience, Brett and I quickly realised that we can't be part because we had our own thing that we were building up people where not ready for that and for the size of it was much too big.
334. People underestimated the training –yes", underestimate the amount of knowledge that needs to be taught to a person to get to a level of production.
335. It's a three-year cycle.
336. What makes difficult is to get to know the needs of the trainer and the producer. Once you know the information it's obvious. Once you know it, it's simple you then quickly underestimate the value of all these little steps of knowing you know. When you know something you assume that somebody else should know the same thing because it's so obvious and it is those little short links that make up the training. So the trainers are

- assuming that the person in front of them knows too much and the foundation, it is then rocky right from the beginning.
337. That's where we don't find change like mulching they use picks instead of hoes.
338. May I suggest something? Just that I know we don't have much time left so in order to do maximise on the little that we have, I would suggest that we continue with the discussion who should play what role and the point that you just raised which is important should come under steps because when you look at the steps of developing a forum one of the things perhaps to look at, to establish the state of affairs: Who is doing similar work? And how can we engage with them and things like that? So that's a very important point but I think it can come in the steps that we can take, that we going to have database of what should come at the next level. So I'm going to ask Brett to make his input and then if you have something to say as far as the whys, the who.
339. OK ... I'm happy with everything I think we need to make a very definite differentiation between market producers and small scale homestead farmers, subsistence farmers that we've got here... that the why it is very different. The producers are definitely there. They need to relate with the market, their role is much more on the production side but more importantly, not more importantly, but as importantly, the small scale of farmer, I think we need to look at value of the small scale farmer in the context of the development of the producer. We need to link the small scale farmer to that producer chain and the reason why we need to do that, it's because right now there are more small scale producers. We have to develop and incorporate the lay knowledge of the existing cultural knowledge that we need to draw on to relate the market, the producers okay. Another problem that the small scale gardens have is one of profitability. You can't say small scale vegetables production is not profitable. You cannot sell your vegetables and expect to make a profit. You can make a small contribution to the household but is not going to profitable. But there is an invaluable thing that we are not doing with the small scale producer and that lies in the development of seed and plant stock. Because in the small scale garden you can develop your Open Pollinated Varieties seed stock and as a small scale gardener can actually you have the time and the resources to harvest and dry seed effectively and because of the diversity small scale system that seed harvesting is seed development. OPV seed development gives them ... if they are given the skills and information around seed harvesting they can be the ones that are providing the viable seed to the nation.
340. And also seedlings.
341. And seedlings. That is what they do. If it is a small scale production would choose production, there is an aspect to it that is micro-production. As a major producer or emerging producer if you have to produce your seed and seedling that's too much. That is the link.
342. We found that the industry becomes compartmentalised and specialised.
343. Okay, can I just make the final connection there on that topic? Basically as a [emerging or successful] producer you have to outsource labour you bring in labour from your community. Now if the producing farmer, say you've got Mr Gwala who is now employing one or two members from the surrounding community on this farm. In the training for Mr Gwala or farmers to support Mr Gwala, his labourers can be trained in peripheral activities or off-farm activities. So his labourer can actually go home and on a small scale produce the seed or the seedlings bring back to work the next day for Mr Gwala to plant. So I think that is one of the things that you need to look at as to

why we need these people in the forum. And then I think we need to look at why we need to include the retailers; they are at the fore-front, at the top end of the producer [chain]. So the retailer we need them there not only for selling of goods but [also] for market research. I think that the retailer needs to be doing the market research and then identify demand.

344. Yes.

345. In the market and creating the ...

346. The trainers also need to be market related. That is why the retailers should be involved in a forum to actually get feedback from both [sides], not so much one way stream of information flow – from trainer to producer and retailer but also a return stream from producer and retailer back to the trainer. This way, the training can become more market driven.

347. And also the farmer will know what required because if you sort of make some sort of blunder and there is no goal in mind, there is nothing to go for.

348. Yes

349. Whereas if you meet all the parties involved, you get a much bigger, much broader picture of what going on. You actually know where you stand in that chain and that helps to settle the whole thing.

350. There is a final thing for me that I would like to include there. It is also under the trainers, why the trainers? The trainers need to be involved in the forum to realise that part of their processes needs to incorporate lay knowledge from the producer. So if you are going target marketing as a trainer ... your introduction day or part of your integral process should identifying an examining of the resources of your target training group before you starting spouting all your wisdom or your knowledge ...

351. Research.

352. Because what happens, I've been with the training and I found that when I train and bring new concepts, especially [those] that people are battling to understand or think are a little bit complicated – because there's lots of linkages that we assume that people know. We just make it become quite intimidating. Once you reach a point in your group where they feel intimidated through your flow of information ...

353. They switch off but more devastating they don't share. They're now too embarrassed to share what they have because now they feel inadequate and inferior. They don't want to put themselves in a position where they can say something that embarrasses them and the richness of that interaction is lost.

354. One is a top-down approach, the other one is bottom up.

355. Well, it has to come from both sides.

356. You have to be sensitive and humble enough not to think that you are the repository of all knowledge.

357. This is why we are setting up this forum; it is to be more sensitive. This forum is not so much to me, is not so much about yet another source of information. It is to encourage sharing.

358. Yes.

359. We all play different parts in it

360. Yes.

361. This is what we contribute to the whole. Everything has got an important part to play in the chain. I'm finding, it's for me I don't go in there with the knowledge that I have about how to grow, the principle and I know what it is like to be a farmer ... But I as a retailer I am interested in the organic label, that they have got the crop and the quality of the crop. Whether they are putting in mulch that is not my business ... it is the

business of the trainer and the mentor to make them aware that is if they apply the correct methods, they will have a much easier time of it ... My business is to buy stuff produced by application of the correct methods . So we all work together. They will learn form their own experience as well. You know and what I also said earlier, I think it would be a very beneficial, thing if one is established the forum of the different players that are needed to make the industry successful. If all the different areas could commit to do some sort of community training you would commit to doing for free so many hours in month of giving people, for example, not everybody is good at marketing. We have been doing it and doing it successfully so we would commit to giving you two hours to different training bodies that you could say right, these people are ready for a marketing talk have you got time on this week to present to them a point of your marketing? So that you would your expertise shared ... where people come and talk about the different areas that farmers need to consider when growing crops and the criteria for selling.

362. Thanks Eva. Razio, can we have your input?

363. I am happy with that.

364. I might have something to say based on my experience on forums.

365. Okay, great.

366. Forums I know become talk shops. You know when you have specialists that get together and talk. What I'm kind of seeing here is that you want to get something more

...

367. Results driven.

368. So, maybe it is the kind of terminology. It is [sounds like] more of an association of people working together, a sort of a partnership.

369. Certainly, that is what we established over the last three days. Actually we need a label under which we all work. And our intent needs to be clear, [that is], what we want to do and then create a label, whatever body. ... We have already some credibility that we have established through our shop that has been established for so many years and have credibility with media and with the public. If we could develop like a branding then there could be ...

370. It seems to be more like a business strategy, an enterprise development.

371. Yes, that's what Razia said.

372. Yes, I think there is a dimension of business and there is also a dimension that is beyond business.

373. Social investment that is what we were talking about.

374. Yes, yaa.

375. I would like to say we can buy into it and then co-create the identity.

376. So you are saying we need to develop what?

377. Association criteria?

378. An identity really.

379. Yaa it is like a framework for identification because otherwise it would come to the same thing, who is identified?

380. Yes, because there is a danger that if it is too close to Earth Mother Organic, it could alienate what we are trying to do in a larger sense. You know, I'm aware of that. I don't want to be perceived as trying to capitalise on the small market. You know, it's very important for it be seen that anyone, yes, Earth Mother Organic has an identity within it. It is a fundamental part of the prototype. But there is a reason for the prototype to be developed in a larger sense.

381. I was saying to Chris the other day that the difference is between the two groups' proposed solution was that one put Earth Mother Organic at the centre of in the circle, while the other put it there as one of the members that would form this forum [illustrating with drawings in flipchart]. And I think we are talking more about this arrangement [referring to the latter group's proposal].
382. It might be a phased from one form to the next because the prototype is Earth Mother Organic.
383. But if you do it from this [referring to the proposal to have Earth Mother Organic at the centre] then problems of identity arise.
384. I think we should move on.
385. Yaa, yaa.
386. So can we go as far as that because the rest would be shaped by ...
387. Yes, do you have something to say?
388. No, no, no.
389. So we can go as far as that because the rest will come from that, from the framework of identity.
390. I think I must say something. I don't want to come across all of a sudden as ... I've come to this workshop and now hey this is a good idea. You know, this is something I've been working for many years and this is an evolution of the process, you know. So, I have a lot of people that are already in the network. This forum is already partly created... So I think that this should be noted in the study – that yes it has already evolved from sort of ground work laid before.
391. Yaa for sure. It has just taken you this long to get to a place where you can launch it, refine it.
392. Yaa, find the direction in which we launch it because I went [inaudible] for many years with very little effect and it comes back to sustainability...
393. It also raises the question of ownership and ownership at two levels, ownership of the idea and ownership of the forum. And I think you might want to reflect a little more and see how you present that because if you are saying this is my party and I'm inviting you to it, it would send very wrong signals.
394. Yes but what I mean by that is my process has led me to understand that this forum is needed.
395. Okay, I understand.
396. There's always a danger of personalities. Power is a terrible thing whether it is social power, egotistical power, all these things one has to be aware of. The nature of the forum certainly has to be that but also to play humble you know, it takes a strong character, to bring this kind of thing together you know what I mean ...
397. That's not being underestimated.
398. Yaa, as a leader you always have your ego challenged. As a leader personality which I have always been in my whole life. If I play a sport I become the captain of the team, not because I'm the best but because that's my nature. I am good at bringing people together, working with people. So, I'm not going to deny that. It's part of who I'm. We all have different gifts.
399. I just wanted to caution you about the idea of ownership and the perceptions that will come with it.
400. You can't do it alone.
401. Absolutely. No true leader, leader does it alone. It is a collaborative thing because otherwise you are a dictator.
402. You are not leading anybody ...

403. Leading yourself down the thorny path. [laughter]
404. OK so now we have the simple question of what problems we are likely to face in the formulation, in the development, in the setting up for this forum.
405. My biggest difficulty is that I see the problem of getting people around the table in this busy day and age. You know like this workshop was a perfect example. It should have been 12 participants sitting on the table for four days. But Razia and I are the only participants who have been here every day.
406. True.
407. But we were also here yesterday...
408. Yes, but altogether we have like 16 to 17 people coming over the four days.
409. Yes and for the short time that the people were here, they made invaluable input.
410. Perhaps it was the timing.
411. No, there is not good time.
412. The point that Razia is making is that this workshop has been incredibly productive. And one tends not to get anywhere because if you try and get everybody together at the same time, it is impossible. What made this workshop work is the methodology which has been able to be flexible. As a forum, it must be able to work with a small group, a large group of individuals and present the absent like you mentioned in the past.
413. Yes.
414. And how to make it work, I think it comes down to not so much how many people can get around the table but how we effectively get the feedback ...
415. Yaa, yaa.
416. Maybe that's part of the framework that I was talking about, that flexibility will open it up for other people to participate.
417. So will you send the minutes of this workshop, the notes?
418. Yes. I think next week they would be there. I will send them. Is there any other problem? Razia, you indicated you had something to say.
419. Resistance to the idea of the forum from individuals or government might have other ideas about the industry.
420. Where do we meet?
421. That's to be discussed but I don't think that there is going to be a safe place.
422. Because we have some venue.
423. The farm here, this is a productive place to get people together because of the fact we are doing it. This is it. And it has a massive impact on the workshop ... so will continue to use this. Part of my plans, I am moving this workshop [meeting place is normally used for carpentry] out of here on Monday to a factory in Pinetown. I'm freeing this place up so that this place so that it becomes more user friendly for what we are doing not only production but also in a production of this organic network so this would be a primary venue I suppose we can call it.
424. I was going to suggest decentring because we are going to have stakeholders to work with and if you continue to meet at one place, it also creates, brings in dynamics so you may have your primary venue but it would be good to have something ...
425. Yaa, yaa, yaa.
426. It could be a starting point.
427. Yes, within the structure of the forum there will be flexibility... If you go try and sell kitchen to a farmer you don't go in a suit and a tie. You go with an image that is appropriate. It is the same as stakeholders here. If I'm going to type ... and use my supper colour printer and send invitations to farmers to come to my organic forum in

the affluent area of Assegai – straightway, I have distanced myself entirely. I would be happy going to see the stakeholders in their own environment. I think it's very important.

428. Any other problem you like me to face?

429. Yes, one other thing where are situated is a big new park called ... At the moment there are at least 160 companies and that is about 60 % of them. And they have to meet social responsibility... and the EThekweni hospital is a possible places to sell produce.

430. I think it also comes down to identifying existing structures you know again like tying in those existing structures because this is what this forum is about. This is what we are proposing to do. It's very much a matter of again like when you approach that farmer for training and you start at a whole lot of things that you know work before approaching him about his lay knowledge and their own experience. That's the danger faced by a forum of this nature. If I'm gonna approach or we gonna approach existing networks this is what we want to do and something that we are about, you know it's more about investigative work at this point.

431. What would be very nice is for us as far as the forum is concerned if one got to get us group, target initially the different sectors and find out what the issues were. So if you would have, I always speak for my point of view because that's the one that I know most of but if like for the other people the main point isn't marketing, ... you would have one meeting where would retail and marketing. Everybody would say what their issues... I've got the voice I'll go and talk to anybody. There is no level that I'm too intimidated to go: the corporate sector; I can go and I can speak to Zuma [the President of the country]; but I don't have all the ideas always in my head and so in a forum such as we going to establish it would be very interesting if we took themes. Where one initially would brainstorm that sector what would help in that sector – because Brett and I have experience in farming and all of that too. We've got lots of hands-on knowledge of what worked, I mean through eight years of making mistakes. So we have a lot to contribute on farming, that sort of area – farming, mentoring and training. We could also create the subject matter of the forum as it were and then also then invite related people to that theme which we are going to discuss with our core forum.

432. The forum has to be target specific. It has to be structured like what we did with the process of this workshop. We started with 15 different things and created a hell lot of talking and excitement, a lot of interest but it took us five [4] days to get down to one thing that we can work with. So I think now we have to reverse that process ... So basically start with the identity of the forum that we now have. What are our needs? And then to take them one at the time like I feel that methodology works – take one small thing and focus on it and get all the stakeholders to focus on that one small thing because it is a ecosystem. Everything is interrelated in the organic farming from the marketing, training even the growing. The nature of the animal-plant relationship, all of them are interrelated. So the nature of this one is that you quickly get into the globalisation of the subject matter. [If] you quickly try to bring in too many things ... In my opinion it needs to be taken one at a time, like for instance the lay knowledge of farmers, that needs to be a target of the forum so that we approach all the stakeholders from the internal ring and the outer ring, put through our networking possibilities of e-mails, telephones, letters and everything. This is what we want to do. This is our topic for month or this is our target discussion. Which one are you specifically interested in and feel that you have contributions to make to? And then bring people together and do that.

433. And there will always be a section at the beginning of the meetings where one could do follow up of what happened at the one before, like a short summary of what came out of it.
434. We can conclude that once you have done that, it's the job of internal group of the forum to then disseminate that information back out to everybody you know so that it's like coming together like narrowing down and focusing on one thing producing outcome then disseminating ... What we have at the moment, it's like a drizzle that goes over everything and comes out as a drizzle. I think we should direct the drizzle into a funnel so that it creates a powerful stream that then can flow.
435. We've kind all got very broad range of opinions, ideas and resources on every topic.
436. That is very opinionated. It is fantastic.
437. Yes, you know why we all know something because we all gonna do everything even though we are not experts in everything. So we end up doing everything. We've all got a tremendous bank of resources, all of us; although those aren't our areas of expertise but we all have got to contribute.
438. That is an attribute as well as a problem factor.
439. Because it is so diluted?
440. That is the thing, that is what I am saying, that is what I see. I see one of the functions of the forum being taking that wealth of information and handling it piece by piece again recognising where industry is. Yes, here is your wealth of information. But that is jack of all trades and master of none. That is where the organic sector is at this moment.
441. But we are masters of one. We become ineffective if we have many things to do.
442. Yes, that's right so the too many really good. So I need that to bring that back down focus on one thing at the time.

The following list of activities for the way forward was captured on flip chart

Activity	Person responsible
1. Compile minutes of the Durban Organic Farming workshop and circulate them to all participants.	Mutizwa
2. Identify interested individuals from each stakeholder group to form the core team that will drive the process of setting up the Durban organic forum.	Brett
3. Identify existing organic movement structures in Durban and build a 'database' of them.	Core group
4. Identify further issues and working ideas in the organic sector.	Core group
5. Convene a meeting to deliberate on the identity of the forums, including on how it would operate, who would be members.	Core group

443. Okay, I would like to thank everyone very much including those that are not here that have been coming and those that were not able to come for the initiative, for the thoughts, for the energy and hopefully for taking the process forward into the future, into something.
444. Thanks Mutizwa for the process.

445. My pleasure. If you've got something to say about the process, not about me, please feel free to talk.
446. I've found the grasping of the methodology we are using in this workshop – it has been a very profound thing for me.
447. It brought us to where we wanted to be.
448. You see, I am a carpenter and I value my tools very highly. As the quality of my tools improves, so does that of my work. I'm very excited about this workshop because it made me understand that what I'm doing in the organic sector because I'm a hands-on person.
449. Thank you very much to Mutizwa for bringing us very efficiently ... it was focused. You knew exactly every step, what to follow and if it wasn't for that constructive method, we wouldn't have realised that we needed to form a forum. It has definitely given us a structure to work towards.
450. And we hope that this is not last time, you know, thank you for bringing us together back again...
451. The vision is so great, the topic is so huge, and the information is so vast. Where do we start? You know and I just to want to thank Mutizwa for the methodology and that I've gathered from this workshop. It has really given me a workable methodology and now we actually achieved tangible results as opposed to working towards a very clear vision but with very dull tools ...
452. But you know there are many wholes out there that can add to this.
453. I just want to get a book; I want to read something from this book of mine. This is a book on Native American Indian philosophy. I also want to show you the sketch I did of you in the workshop because since I met you ... [shows the sketch] ... It [the book] concentrates on what animals represent in a human context and you find that each one of us vibrates to a specific different animal
454. And what kind of animal are you?
455. Well Mutizwa is a turtle because the vibration is so similar there. I find your nose very similar ... [then he begins to read from the book] _It is a personification of planet Earth ... We are reminded by the turtle of the principle of give and take, to give back to the Earth as has been given to us. The symbol of the turtle is to have the creative source within you... The turtle warns of the danger of pushing the river... Turtle buries its thoughts like eggs in the sand to allow them to hatch the little ones. This teaches you to develop your ideas before bringing them out to light... Bigger, stronger and faster are not always the best ways to a goal. When you arrive you may be asked where you have been and you may not be able to remember. In that case, arriving prematurely can make you feel immature... [reading ends] That for me comes to mind because of the methodology.
456. That is flattering [laughter]
457. Does the shell fit?
458. And in Zulu we call it ufudu...
459. Okay, thank you very much.

3.7 DURBAN ORGANIC FARMING WORKSHOP HELD AT THE ISIDORE ORGANIC FARM 3-6 AUGUST 2009

1. INTRODUCTION

The aim of the workshop was to jointly question the current learning and practice of organic farming and marketing among participants, bring out issues and model solutions to some of the issues. The purpose of the workshop was pursued through:

- a. Tracing the history of organic farming among participants;
- b. Obtaining a systems view of organic farming in the area;
- c. Sharing and analysing learning and practice problems in relation to organic farming and marketing;
- d. Sharing models to analyse the problems and develop solutions;
- e. Analysing and developing solutions to a selected critical and concrete problem being faced in the organic sector in Durban; and
- f. Develop strategy to carry the intervention forward.

The workshop took place over four days (3-6 August, 2009) at Isidore Organic Farm in Assegai, Durban. Each day's meeting lasted an average of three hours. It was attended by organic farmers; organic trainers; environmental educators; retailers; NGO leaders promoting rural development; community development facilitators; organic farm workers and a smallholder farming development sponsor. The workshop was facilitated by a Rhodes environmental student in liaison with his colleague. Most participants attended less than four days of the workshop due to other commitments. The process of the workshop enabled those who joined latter to be filled in and catch up with others as there was a recap at the beginning of every session/day. Daily levels of attendance fluctuated, with the highest attendance being 12 research participants, and the lowest, six. All in all, 16 local people in the organic sector and two students attended the workshop. Of these 16, 25 % took part in the initial data gathering phase conducted by the facilitator in September 2008.

Findings of the research revealed several learning and developmental problems being faced by farmers, organic farming facilitators and local entrepreneurs. The findings, which also discussed motives for learning and practising of organic farming in Durban, were disseminated to workshop participants a couple of days before the workshop. In addition, conscious attempts were made to make present, the absent, especially the small scale subsistent organic farmers and local government.

2. DAY ONE

2.1 Welcome and introductions

Brett Muller, the host, welcomed participants and thanked them for making the time to attend. He gave a brief background to the workshop. He handed over to the workshop facilitator, who then asked each individual to introduce themselves. Those who attended the workshop were organic farmers; organic farm workers; organic trainers/facilitators; buyers and sellers of organic produce; a funder; Non Governmental Organisations (NGOs) promoting rural development, health and organic farming. At the end of the introductions, the facilitator outlined the purpose of the workshop and the planned programme. He also asked for permission to take video pictures during the workshop and each individual agreed before

the pictures were taken. The request was repeated at the beginning of each day and permission was granted by individuals in all cases.

2.2 The shared vision arising from individual motivation

After the introductions, participants were asked to answer a set of questions (Box 1). A shared vision was later constructed collectively from answers to the question on motivation.

Box 1: Questions for individuals on day 1

Please outline the history of your involvement with organic farming , especially in terms of:

- a. Your motivation – the why;
- b. The main stages you have gone through;
- c. The changes and turning points and what triggered them;
- d. Your breakthroughs and innovations; and
- e. Problems encountered.

From the deliberations on motivation, the following shared vision emerged: ***“Human health, wealth, and environmental sustainability”***.

2.3 A summary of problems

Each participant shared the problems that they were facing in the sector. The problems were then summarised into the following:

- a. Too much theory and too little practice;
- b. Irrelevant training (which excludes marketing among other things);
- c. Inadequate follow up and mentorship;
- d. Lack of interest in agriculture among the youth – farming as demeaning;
- e. The appeal of buying food versus producing it;
- f. Farmers growing what they can and not what is needed on the market;
- g. Lack of infrastructure to support organic farming;
- h. Logistics to manage the production and distribution of organic produce;
- i. Poor quality of produce in some cases;
- j. Lack of reliable supplies across seasons;
- k. Limited supply of open pollinated seeds;
- l. Difficult agro-ecological conditions;
- m. Labour intensiveness;
- n. Organic farming is a complex process which needs to be learnt and practised over long periods of time;
- o. Farmers reach ceilings after meeting household food needs; and
- p. Competition with conventional agriculture which is privileged by government and media.

2.4 Individual biographies in the organic farming sector

The histories highlighted the tendency to move from simple activities to more complex ones; from starting with idealistic intentions to becoming more real with time, from individual concerns to collective interests as the activities became more complex. One of the most compelling biographies to be told was around the evolution of entrepreneurship, of Earth Mother Organic. Some of the details were obtained outside the main workshop as follow-up.

The details have been included in the report because the lived story illustrates how people use double-binds, catch 22 positions to improve their practice or situations – a concept which is central in expansive learning, which is been employed in the study.

Table 1: Evolution of Earth Mother Organic

Stage	Problem (double-bind, contradiction)	Solution
Working as flower shop assistant	Not enjoying the job, feeling underpaid, not being able to sponsor own yoga lessons.	Earn extra income by selling organic vegetables to women attending yoga lessons using a small Corsa car
Organic vegetable seller	Demand for organic vegetables found beyond the yoga group; potential to earn more money noted but Corsa car too small for the necessary volumes.	Approach spouse for a bigger truck, a Chevrolet and sister to increase investment in buying in bulk and selling together. Selling off the back of the truck.
Organic vegetable seller with sister as business partner	<i>Double bind</i> reached when the law did not allow them to sell off the back of the truck. And yet they needed to grow the 'enterprise' as the demand was there.	Adopt a two-pronged approach: make deliveries to households and at the same time identify farmer markets to sell organic vegetables in different parts of Durban on different days.
Business partners delivering to households and selling at 5 main markets and at special events	Sisters hit a snag in the summer months because there weren't enough local vegetables to meet market demands. Business needed on-going trading to so that entrepreneurs would have enough for their upkeep. Sisters did not have the money.	Approach parents for the necessary capital which they got. Import bulk produce from Europe summer and benefit from economies of scale.
Selling imported and local organic produce as team	Selling imported produce on the farmers markets presented new challenges. The imported stuff was too bulky to be sold through retailing by the two. The prices of the imported food were too high for buyers at the markets. Storage costs were also high and the open environment was not good for preserving the good looking quality of the branding. And yet the sisters had a hunch that there was potential for profitable business in this.	Sisters (business partners) register as a company and look for proper premises from which to sell produce in a location where appropriated buyers could be found. They seek professional input in business development, divide the business into two: a wholesale business which would ensure the fast movement of imported stuff and the retail department to sell local and imported organic produce to consumers. Establish a professional accounting system supported by the necessary software and hardware.
Operating as a registered business	The site of the business was not appropriate yet; the potential of the venture seemed high. The function of retailing still needed to be supported by regular contact with suppliers in and around Durban to ensure the right quantities and quality of vegetables.	Ownership as shareholding in the business. Look for a more appropriate and spacious business site in Durban. Add a 'slow food' dimension to business – value-addition. Hire staff to help run the retail and café. Establish website.
The venture with a wholesale, retail and restaurant	Some customers begin to ask nutrition-related questions to the retailers who are not trained in nutrition. Local organic supply volumes drop partly due to aging population of suppliers, while demand increases.	Attend course in nutrition (employee). Identify 'new' organic farmers and supply them with seed and seedlings to get them started. Arrange for a form of contract farming based on principles of fair trade and trust.
The future business	Uncertainty about contract farmers' ability to deliver on promise. To expand the business further afield or to stay put in one town? To join big established retailers or to	

	be their competitor?	
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3. DAY TWO

3.1 Recap of day 1

The host welcomed the new comers to the workshop and handed over to the facilitator who summarised the purpose of the workshop, what was covered on the first day and what was planned for the day. The facilitator proceeded to outline a framework that was going to be used in understanding organic farming as a system and another which was to be used to develop a considered solution to real systemic problems being faced by research participants. These are presented below (Figure 1 & Figure 2).

3.2 An activity system and expansive learning models

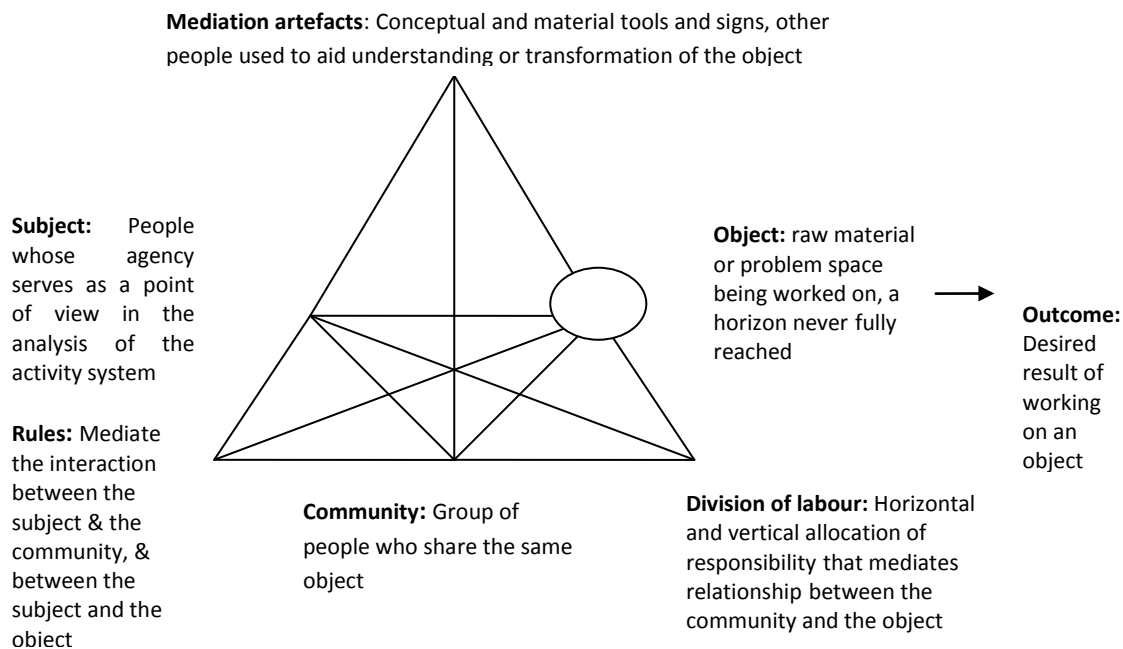


Figure 1: An activity system as a way of getting a good and holistic picture of a practice

The following points were highlighted in connection with an activity system:

- An activity system is rooted in systems-based thinking and helps one gain insights about the real world.
- It is based on the proposition that learning is a social and cultural process, which benefits from historical achievements.
- People use tools to manipulate the environment and to obtain the information they need towards achieving an intended result. Tools therefore mediate people's actions and relations with their object. Physical tools carry cultural thoughts.
- Human systems, which can be social, cultural and organisational, also mediate how people conduct their activities. These constitute the context (rules, community and division of labour).

- e. Disturbances and contradictions² in the system or between systems offer potential to learn about the real world. The most difficult contradictions to use as springboard for learning are those that are invisible or un-discussible. Surfacing these is critical to developmental dialogue.
- f. Contradictions offer potential for the development of an activity system or of a practice.

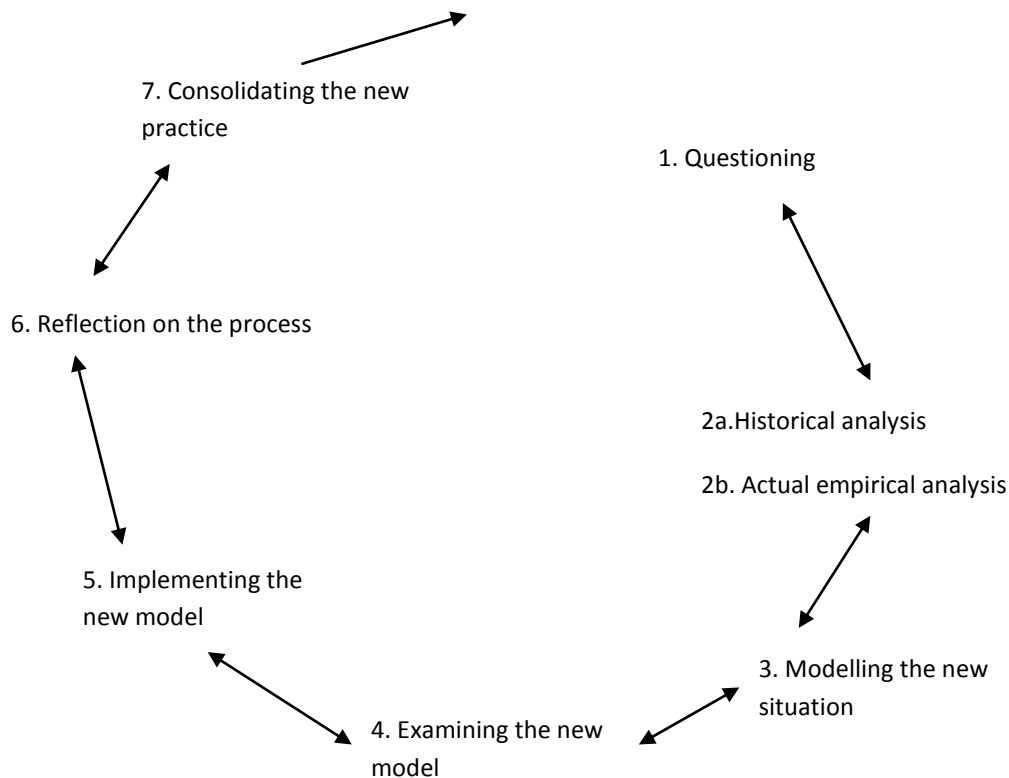


Figure 2: Expansive learning process to support resolution of issues

The facilitator explained the expansive learning process as follows:

1. Questioning: drawing on researched evidence to question existing practice or existing wisdom;
2. Analysing: tracing and analysing the history and current dynamics of learning and developmental problems in the practice;
3. Modelling: involves the construction of new ways of working or engaging with practice;
4. Examining the model: experimenting with the new model to fully grasp its dynamics, potentials and limitations;
5. Implementing the model: working with the model in real life situations and monitoring its impacts;
6. Reflecting: Using monitoring data to evaluate the model for refinement; and

² In the workshop we used the word problem to refer to contradictions. However there are differences between problems and contradictions, with the latter referencing to structural tensions that exist in an activity system or between one system and another; or within and between practices.

7. Consolidation: Implementing the refined model into a new, stable form or part of practice.

The facilitator concluded by pointing out that the workshop intended to go as far as stage 3 or 4 and leave the rest to the participants. This was partly because the whole process often takes a number of years to be completed.

3.3 Problems: further discussions

The facilitator presented a set of 14 problems which combined those identified on the previous day and the ones identified in the September 2008 study. Workshop participants indicated that the list was too long and many of the problems could be clustered and reformulated. Three groups were formed to reformulate three clusters of some of the problems. During the discussions on clustering problems two dangers were identified, namely the tendency towards making the problems abstract and less concrete and the other consisted in defining the problems in ways that would push them out of the participants' sphere of influence.

Another interesting issue that emerged during the discussion was around intellectual property rights versus sharing of information among the various actors in the organic sector in Durban. The main conclusion on this was that protecting organic information could benefit individuals in the short term but would undermine every organic actor in the long term because it would result in a stunted growth of the sector at its own peril as the conventional agriculture would continue to grow. Another important discussion was on role of media as a potential ally in organic movement development but others were sceptical about it because it is often saving the interests of the corporate sector.

Table 2: List of problems and their synthesis

Summary of problems (interviews and workshop)	Further synthesis during workshop
1. How to break the subsistence ceiling and reach commercial production.	The problem of implementation : time lag between investment and profit, long distances between actors along value chain, poor farm infrastructure, and low levels of support, monitoring and mentorship.
2. Fragmented nature of the organic sector (apart from market linkages which are still weak).	
3. The time lag between building land capacity to produce organically and the need to generate income to support the farming activity (ecological time logic and economic time logic).	
4. Tension between the scale of production and the reason for producing.	
5. Agro-industry interests and organic movement interests.	The problem of quick money : while the agri-business makes money from its chemicals, the poor leave their homesteads, lose their agriculture knowledge, work in towns, earn little, eat poisoned food, get ill and die.
6. Short-term interests versus long-term interests.	
7. Lay knowledge versus scientific knowledge.	
8. Training that is decoupled from the contexts and realities of the people.	Government failure to make people understand its sustainable agriculture

9. Demeaning of sustainable agriculture, especially among youths.	policy and to provide the appropriate training.
10. Limited (policy) incentives for organic farming.	
11. Constant need to balance social, economic and ecological values of organic farming.	Not revised.
12. Making time to reflect on practice and document (practice-reflection disconnect).	Not revised
13. Appropriate tools.	Not revised

After further discussions on the synthesized list of problems, the participants agreed that they were facing the following set of problems in the organic sector:

1. Quick money
2. Displacement/marginalisation of sustainability knowledge and values
3. Implementation
4. Inappropriate training
5. Lack of linkages in the organic sector
6. Public awareness/consciousness
7. Reflection-practice disconnect
8. Imbalance between the social, economic and ecological performance.

3.4 Selection of problems to work on

The day was concluded by a selection of the problems to work on. Each participant was asked to choose their most important issue that needed to be worked on by indicating the number on a piece of paper and the following were selected in descending order:

- Displacement of sustainability knowledge and values;
- Quick money; and
- Poor linkages in the organic sector.

4. DAY THREE

4.1 Recapping and sharing learning materials

The session began with a sharing of resources materials from some of the organisations represented, namely: Heifer International; Earth Mother Organic; Share-Net; SADC-REEP; Isidore Organic Farm and E. Gori Associates. This was a positive and unplanned for happening, which underlined the value of such forums. As with the second day, we had newcomers and some 'old comers' not coming. The newcomers were photographers, a Permaculture consultant and a journalist who reports on the environment and an environmental educator from Share-Net. The host welcomed and the facilitator recapped proceedings of the previous two days.

4.2 Step-wise problem solving

The facilitator shared a framework for analysing problems before developing solutions which was linked to the expansive learning process. He recommended that the workshop process and the learning and development method being employed in the study preferred to follow the **four steps** because the solutions generated were likely to be deeper and superior to those generated without going through the necessary steps. Figure 5 summarises the process, which allows its user to pause and look beneath the surface, the obvious and the immediate.

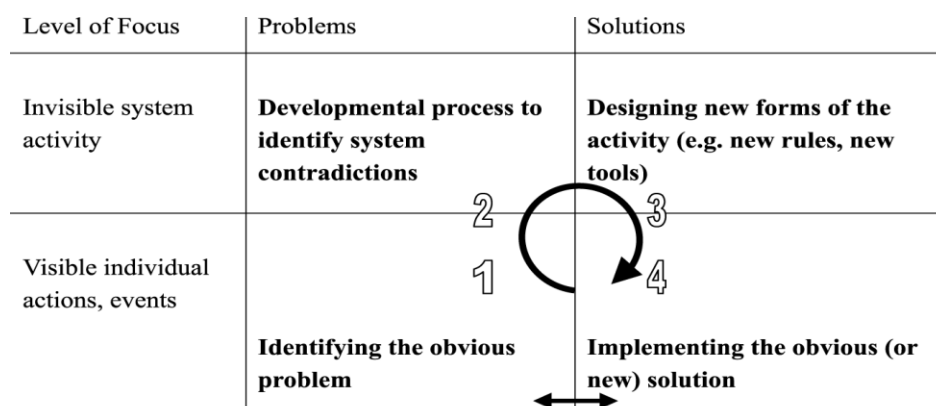


Figure 3: Problems solving pathways

4.3 Working on the linkages problem

The facilitator asked participants to work on their third choice because of its relative concreteness to their experiences and they agreed. The process of analysing the problem and developing a model solution was guided by the expansive learning cycle (Figure 2), supported by Figure 3. The following questions (Box 2) guided the discussions of the day.

Box 2: Questions to guide the analysis of a selected problem and how it could be addressed

1. What vision do we have of linkages in the organic sector of Durban?
2. Who should be linked to whom? What should be linked to what? Who should be linked to what?
3. Why is the organic sector fragmented? What is the history of this lack of working together? What are the effects of the lack of linkages? *(Last question not addressed because of time constraints)*
4. What can we do to address the problem and move towards our vision? What strategies, tools, processes etc, can we develop to address the problem?
5. What challenges are we likely to face in implementing the solution?

4.4 The stated vision of the organic sector in Durban

*“We want to see a Durban organic sector that: links the agricultural production and distribution chain; has horizontal networks of actors (e.g. among organic farmers, trainers); has a platform to engage regularly to learn, plan and act together; has mechanisms for collecting and keeping produce; stimulates interest and enhances capacity in organic production; has a **recognised structure** that drives the process and holds the system together.”*

4.5 Analysis of linkages problem in the sector

The workshop concluded that there are limited linkages between: trainers and retailers; farmers and retailers; farmers and agro-processors; farmers and seed (open-pollinated) producers; farmers and producers of tools and equipment for organic agriculture; NGOs and

consumers; donors and organic farmers; government and organic farmers; environmental education bodies and the organic farming movement; the organic farming movement and opinion makers such as the Nelson Mandela Foundation. Other poor connections were identified in terms of consumers not knowing enough about nutrition; the public not knowing the effects of agro-chemicals on the health of the soil, water and biodiversity; disconnect between lay/local knowledge and scientific knowledge, the old and the young.

4.6 Explanation of fragmentation in organic sector

Workshop participants gave the following reasons for the lack of effective linkages in the organic sector of Durban:

- a. It is currently difficult to make money in the organic sector and meet the costs of relating and networking;
- b. There are cultural barriers which are manifested through poor understanding of one another and low levels of trust;
- c. Poor communication across the sector is coupled with poor listening to one another;
- d. A strong culture of individual approach to work and little in the form of joint work fostered by failures of cooperatives in the past; and
- e. Inadequate infrastructure to support the organic farming movement, ranging from lack of collecting centres in rural areas, to monitoring, mentoring and inspection capacities.

4.7 History of a fragmented organic sector

Since there was not specific history to the new proposed activity system, the workshop looked at one example of how lack of effective linkages in the organic sector movement resulted in the collapse of an organic agriculture initiative in Durban (Box 3).

Box 3: A fragmented organic sector, the story of one farmer association

A group of 200 farmers (Ezemvelo) formed an association to produce organically after receiving Permaculture and organic farming training from an accredited training provider. The farmers went back and tried to implement the ideas that they had learnt from the training. In the meantime a retailer set up an infrastructure to buy organic produce from the association. The farmers did not produce much because they did not have the necessary capital to engage in meaningful production. Government, NGOs and donors did not support the farmers in a meaningful way. Meanwhile some academics came to study the association and its initiative and left with doctorates. An agro-company then dangled a carrot in front of the farmers in the form of a promise to support them if they were to plant hybrid/GMO seed. The association failed to move to the level of producing organically and has had to formulate a new purpose, which is to establish a hub that provides market intelligence to organic farmers in the area.

4.8 Modelling a solution to address poor linkages in the sector

Participant broke into two groups, to develop a solution to the linkages problem. The discussions took about 45 minutes. Both groups focused on a solution to establish a structure that would mobilise the actors in Durban towards the stated vision (See 4.4). However, there was a difference in terms of where to begin, which can be summarised as:

- a. Group A proposed the development of linkages around a structure that was already there – a retail business, Earth Mother Organic.
- b. Group B proposed the establishment of a new structure, a Durban Organic Forum.

After plenary discussions, participants agreed on the establishment of a Durban Organic Forum, because they found it important for the forum to have a **distinct identity and focus** as it was intended to bring actors and stakeholders along the value chain (and not just focused on retailing). Under the agreed arrangement, Earth Mother Organic becomes one of the many potential members of the forum.

5. DAY FOUR

After recapping on the previous day, the workshop focused on developing a Durban Organic Forum as agreed on the previous day. The session was designed to answer the following questions:

- a. Who should be part of the Durban Organic Forum and why?
- b. What steps should be taken to establish the forum, by whom and by when?
- c. What problems are we likely to face in setting up the forum?

5.1 Proposed composition of the Durban Organic Forum

Who should be part of the forum?	Why they should be part of the forum.
Retailers: <ul style="list-style-type: none"> • Informal • Formal 	<ul style="list-style-type: none"> • To provide the infrastructure and income that drives organic farming. • To link producers and consumers; demand and supply.
Farmers: <ul style="list-style-type: none"> • Subsistence • Emerging • Successful/Established 	<ul style="list-style-type: none"> • Subsistence farmers to initially focus on seed and seedling production because they have small holdings. • Subsistence farmer improvements are instrumental in community development. • To enhance farmer self-reliance across the board. • To link selves to markets and suppliers. • Farmers provide ‘lay’ and local knowledge and receive other forms of knowledge • Emerging and successful farmers provide opportunities for local employment.
Trainers: <ul style="list-style-type: none"> • All levels of trainers • Mentors 	<ul style="list-style-type: none"> • Support farmers to learn new agricultural and marketing ideas. • Provide ‘neutral’ and ongoing support to farmers in terms of production, marketing, pricing and quality control. • Gather lay and local knowledge and share it.
Local government	<ul style="list-style-type: none"> • Help in the provisioning of local infrastructure for farmers and retailers. • Develop by-laws that govern the marketing of produce and where this can take place.

5.2 Conceptualisation of the Durban organic forum and its neighbours

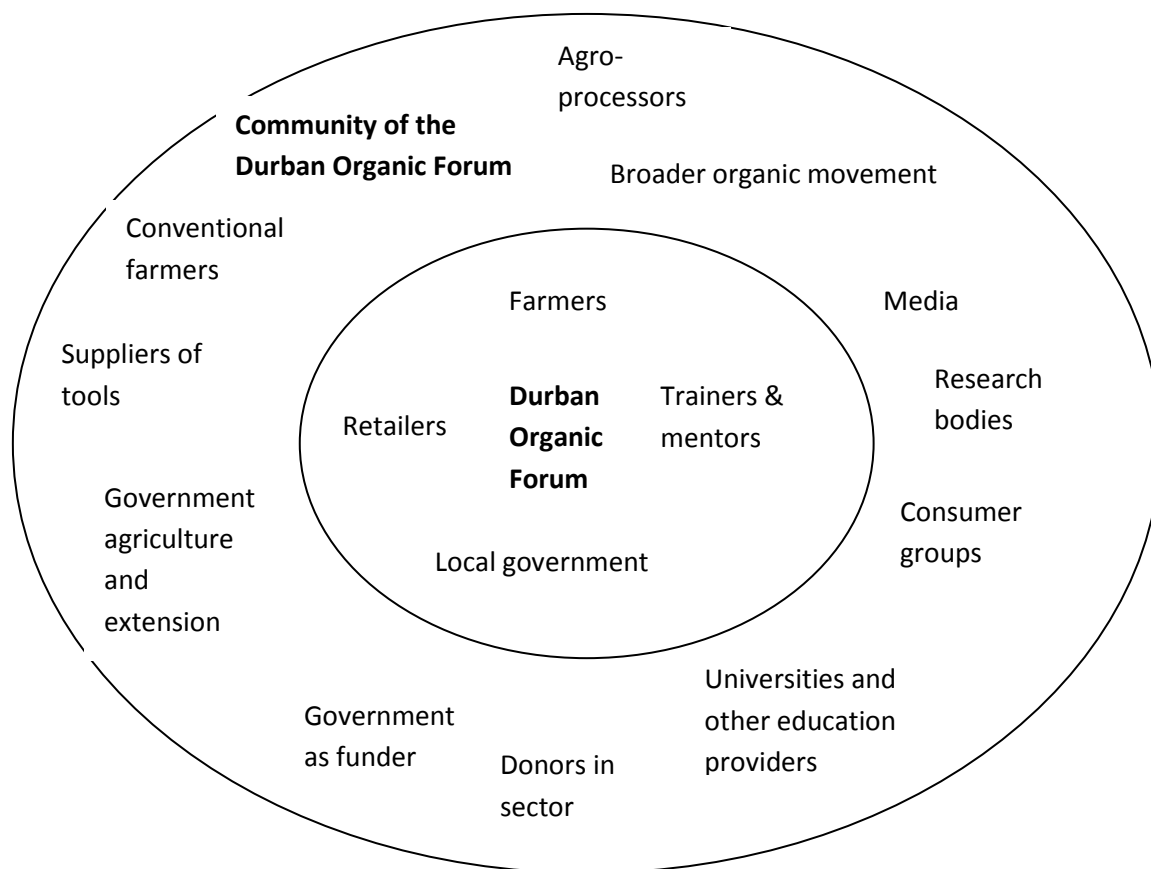


Figure 4: Durban Organic Forum composition and stakeholders

5.4 Guidelines for setting up a core group for the Forum

Participants agreed to establish a core group of people to coordinate the further development and actual implementation of the forum to address the weakness of linkages with one another in Durban. Members of the core group should:

- Have vested interests in the success of the idea;
- Have demonstrated passion for organic movement;
- Have the time to invest in the implementation of the idea; and
- Be chosen from the four main groups identified by the workshop.

This core group should also assume an identity which resonates with its principles and with representation of different stakeholder groups in the planned forum. Brett the host and organiser, was selected to *spearhead* the process.

5.5 Proposed guidelines for membership to the forum

Some of the proposed principles to guide the formation and functioning of the Durban Organic Forum are:

- a. Members of the forum should commit to providing community services in the organic sector, especially to farmers in order to grow the sector;
- b. The forum should start small and grow organically;
- c. The forum should develop a vision of growth which would ultimately expand to include some of the actors in the outer circle (see figure 3);
- d. It should promote values of organic farming, which includes fair trade, accountability and transparency;
- e. The forum should build and enhance the spirit of partnership between and among the actors along the agricultural production chain towards the holistic organic movement picture of *human health; material well-being and ecological health*; and
- f. Work towards establishing linkages with like-minded organisations in the sector, within Durban and beyond. These would include the national organics associations.

5.6 Way forward

Participants mapped out the following activities as necessary for the first steps towards the establishment of the Durban Organic Forum.

Table 3: Planned activities

Activity	Person responsible
6. Compile minutes of the Durban Organic Farming workshop and circulate them to all participants.	Mutizwa
7. Identify interested individuals from each stakeholder group to form the core team that will drive the process of setting up the Durban organic forum.	Brett
8. Identify existing organic movement structures in Durban and build a 'database' of them.	Core group
9. Identify further issues and working ideas in the organic sector.	Core group
10. Convene a meeting to deliberate on the identity of the forums, including on how it would operate, who would be members.	Core group

As part of the way forward, participants identified the following as problems that are likely to be faced in setting up the forum:

- a. The interested people might not make the time to come together and make the forum work; and
- b. Those opposed to the idea of the emergence of such a strong local organic movement, might undermine it.

5.7 Closing the workshop

After planning the way forward, the facilitator thanked the host for organising the workshop, the participants for their time and input. He also thanked the assistant researcher for his support and patience and the interested people who failed to attend because of other

commitments. He wished the groups success and promised to return before end of the year to share progress. Razia also thanked the host, fellow participants, the facilitator and the research assistant for making her time worthwhile. Eva found the expansive learning methodology especially helpful. Brett closed the workshop by thanking all and promising to do his best to take the process forward, especially as it coincided with his personal growth in the sector, which was beginning to call for a more networked approach – a community of practice. He thanked the facilitator whom he likened to a turtle in traditional American Indian wisdom and read out text on the same.

3.8 SAMPLE OF FEEDBACK INTERVIEWS

3.8.1 Sample interview SA#2

Researcher: Alright we are starting now. So, just to restate the purpose of the meeting: I have come to thank you very much from taking part in the study and also come to say goodbye. But before leaving I would be very happy to have what you have done, the problems you have encountered, what you have learnt since the workshop, the kind of things you have done in relation to the forum.

RZ: There is not that much we have done with regards to the forum. But we haven't really met after the workshop. But firstly I would like to say thank you very much. I would like to thank BM and you. I really feel privileged to have been part of that and for allowing me to gain so much of information about what really happening around the sort of greater Durban area. The problems that I have encountered I haven't really been much. I did start doing some work with one of the Muslim organisation. I had volunteered to go and assist them to set up something in Chatsworth. But the site was really quite a challenging site because it was on a slope. But unfortunately the people there, there seem to be a problem. I didn't know whether the other people on the other project have found this. But the more urbanised people get they are sort of reluctant to really, you know, to work the ground. [Laughter] I don't know whether that's just my perception on whether that's all round. But it certainly like everything have to be there given to them. We have to get this understanding why people need to start farming, to start planting their own vegetables...

Researcher: How would the forum be useful in that regard?

RZ: Well if the forum does happen, take off I think it will be a very good tool to lobby not just to lobby councils that, you look at this the type of planning or these are the actual problems that you gonna see on the ground. At local government level they not really in touch with what is happening on the ground. They know there is need, something has to be done, but not enough is being done and that's where the forum can put pressure and create more awareness.

Researcher: Would you say if you had any direct linkage with the people were at the forum after the forum?

RZ: No, unfortunately not, I did try but sorry.

Researcher: No that's fine. What do you think is the reason for that lack of communication, because the very idea of establishing the forum was to deal with issues of communication as well as other forms of linkages? So, what do you think is the problem?

RZ: I think we are all getting caught up in a lot of what we were doing. It is still vital. It has to be...

BM: From my point of view the forum wasn't created to get people to do, to start something. The people that were brought to the forum were all people doing are doing things in line with what we are trying to achieve anyway. So, they were doing on their own steam at their own

initiative. That's why I chose those people to come to the forum. So it makes sense because we haven't consolidated the core group of the forum. We haven't actively pulled people together because that's the function of the forum we're creating, to hold these people together but until we actually do that those people at the forum are going to do exactly what they did before and carry on working.

RZ: And go back to what they were doing, but it has to be a formulated structure. I mean then you have lost the purpose of the whole thing, if you don't, to create that lobbying.

BM: For lobbying power, you are absolutely right.

Researcher: What do you think should be done say in the next six months with regards to the evolution of the forum?

RZ: Well, we have to get together a couple of us not necessarily at BM's place, maybe somewhere more central. We try to get more people into it, other trainers also, you know people like X and Y you know – other people like them who at different levels who are involved in different aspects of the whole enterprise, and work with it.

Researcher: Okay, I don't know if there is anything else you like to say about the future of the forum and your role in it.

RZ: I think it would be a great if we do set it up, it would really be useful, and it is something that is necessary. It should be done. I don't mind being part of it. It would be a great learning curve and also to get to know the others.

Researcher: BM do you have any comments to make about RZ and her involvement?

BM: For me it is becoming more and more important. Since the forum has happened I have also been busy starting a new project and EM has been running with the forum development, and so I haven't really spent much time assessing it. And I am very glad that you have come back now at this point to pose these things. There is one thing that struck me on this business above everything else is that because I selected members from the forum, together with EM and discussions with other people as to see, basically disseminated what needs to happen, what its functions are and who is gonna be the best person to perform each function. And I came up with a group of people within my resources. But since Mutizwa has arrived it has been very clear to me it is not a very balanced group. Like we are not from an ethnic point of view, I have got one Mr Nkosi who is going to be working with us, and the rest of us are all white. Now I didn't think it that it would be an issue because I don't think along lines of colour.

Researcher: I haven't said anything about.

BM: No, no, but this is something that I am ...

RZ: But you know this is something that we said when [we developed guidelines for the forum]

BM: Why I am bringing it up now is because in my community there are like especially with the Muslim community. I think I mean try now but it was a big learning curve for me to realise that there has got to be people representing different communities in this forum. And I think we have got to really ... I think it's going to involve a lot more than what I originally thought. I think there is still more work to be done, which is encouraging. But it has been one thing that's come up in my mind. I know you haven't said anything about it but you know [Laughter] as I have been listening and hearing about what is going...

RZ: But you know we said this before we sort of rounded up the workshop that we have to look out who comprises the forum.

BM: Yeah

RZ: And this is one of the things that we have to balance you know, gender wise and ...

BM: There is this TV propaganda about South Africa's rainbow community...

RZ: I am not talking about tokenism but we have to balance it.

BM: That's right. That's why for me it was never important to think about this, but I have been thinking about the best person for the job. But there are lots of good people for the work and part of the work, the biggest function of this forum is to have a marketable recognisable brand that people can do work underneath so that it can be marketed as a recognisable brand so that what we are doing is brought together as an identity, both for the power of lobbying and from a marketing point view. I don't think it's very balanced the way it is.

RZ: Tell me; have been to any of those council meetings that happen Thursdays or something?

BM: I went to the 'Komashu' commercial farmers' association meeting and they had a representative from that meeting there that explained to us what, how it works and you know. It is basically a forum to – they get everybody together and then you have got to forward your problems and your issues and this and that they take if the same problem and issue recurs they will take that forward and bring it to the second level of government. It is a way of getting your issues higher up in the government structure. I must admit in certain ways.

RZ: That's what the e-mail was about, you know the one I sent you

BM: Yes

RZ: I wanted the address of where to do it where can one attend the meetings here in ... You know we need to see what, what they are looking at...

BM: You know, all other times...

RZ: We don't what local government is looking at and then we sort of trying to solve the problems on the other side, they are trying to solve you know if you are going to be any...

Researcher: But your plan is to make them part of your inner circle so I suppose you are still on your way to their office.

RZ: Yeah.

BM: You see with the forum, it is early days basically you know we still, it is taking longer than we thought.

RZ: Yeah but we have to know what they are thinking. You know what, what changes or how can we ... if we are going to be a lobbying group, you have to know what lobby against or what to lobby for or you know, how what are what is government thinking because we can form and totally independent, but when there is sort of impact, when we need stuff you know things that local government supplies, we have to know what they are going to supply.

Researcher: You know what was very striking, I had an interview with EM last night, and what striking about the interview was the amount of research that they have been doing around PGS and I think what would also be useful for those involved is the forum is to do research in areas in which they want to have an influence so for example the area that you are talking about, it would be good for someone to take the lead to find out what's going on, come back to the forum so that when you strategise you are doing it in the basis of informed

RZ: Yeah this is now, you are going in one direction and we have to sort of looking at the other...

BM: Yeah I don't think it is not far from it but became you know a lot of us, especially myself have had a lot of dealing with government over the years and I am familiar with what they are doing, why they are doing it how they are doing it and there is – things are always evolving. Where we are now with the association structure is basically consolidating the actual core. This PGS system that you keep on bringing up is actually there is a body of South Africa which is basically a networking body that is bringing together all the different PGS system in SA, that we are setting up, which is very interesting, which we found with research in the PGS through the workshop with Researcher we identified all ... as a group without being aware that this PGS structure actually already exists ... actually ...The parallels are startling. I mean there is exactly what we are trying to do, what we are saying we

need what we are trying to set up. So we have gone basically not having guidelines whatsoever to finding this already established system that this is what we wanted to do and the PGS system is not only in SA, it is in Brazil, it is in France all over the world. This is a massive movement in agriculture and it is basically is the small scale farmer linking up with the consumer. That is what PGS, the whole ethos of the PGS is. So I will forward you that information about this so that you can read through and understand ... you will be amazed because it's like reading through the workshop we did. I mean everything is righter there and the thing is with the PGS is that it is done between the farmer and the market.

RZ: There is no in between. Okay, okay.

BM: And that's the power. That's why it is growing worldwide. The need emerged from I mean different countries started PGSs for different reasons, like certain countries started developing PGSs for socio economic reasons. In America the reasons why the PGSs started to develop is because they had vetoed the use of the word organic through the government. They made it illegal for you to market using the word organic. And they came up with this PGS which is also one of the major functions of PGSs is to eliminate the bureaucracy of organic certification systems because they find that organic certification system, the way they were doing it had become so paper intensive and so difficult to manage that they needed to come up with a simple structure [reflective].

RZ: Now when I talk about knowing what government is doing, what I am saying is what assistance we can get from local government from the forum.

BM: This is what I am getting to.

RZ: Ok

BM: We didn't need to get information from the government. What we consider to do is we need to get on PGS set up and consolidate. When it is consolidated the next step is to draw members into the forum.

RZ: Ok

BM: So you bring as many shareholders as possible, you offer a membership for like a negligible amount, like R50 a month, so that people can afford it and basically you get as many stakeholders into the association as possible, so that you have power in numbers. Those stakeholders also comprise your build up ... your consumers. Your consumers have the option to join the farmer association so that you can actually support the farmers that are growing food not somebody else's farmers, not a concept of farming, nor governmentally or anything like that. You are eating the food and you can support directly through the association the farmers who are producing it. So it personalises the whole thing. At that point once you get enough stakeholders, enough shareholders within the PGSs that become a very powerful body now you can draw on your membership when you want to lobby. For instance you can draw on your membership for the input support and all those things. That then you go to the government and say not what you can give us, but this is what we need ... Every single different PGS has got different things that crop up, there gonna problems. Like in South Africa for instance one of our main problems is logistics, getting the food from the farm to the consumer. So if you go to the government and obviously it is important to know what they are doing and you know whether they are trying to help. But the point of the matter is that what they are basing their help on, the information that they are building up their support on is flawed.

RZ: This why I said if we know that their information is flawed then we tell them that you are looking at the wrong page or you are not looking at the page at all [metaphor].

BM: Yes.

RZ: From now, before they flaw it and flaw it again and again to use a kind word, flaw (laughter)

BM: But at the end of the day, you are not getting to influence them into organic developments. You are not getting influence at this point. The power is gonna have to come from actually creating an alternative. It has become the responsibility of the average citizen average consumer and average producer to create the alternative. This is what we were talking about earlier with and some people don't want commercialisation so what is the next product. It is the same with farming. The government is not helping us right here. So how can they help? Well they can't. They are government. Let them manage things like roads and infrastructure, you know because there is various different issues and problems when it comes to the government. The actual fact of the matter is that if you have farmers producing organic vegetables and you have people paying cash for organic vegetables, where do you need the politician.

RZ: No, no you don't need the politician.

BM: and also what you are doing with the PGS system is building up.

RZ; But to develop that farm, there might be some sort of infrastructure that they put, that government can assist in getting the produce to the consumer but to actually assist the farmer.

BM: But you see again, it comes down to the social problem, where if you are given a hand out by the government because I mean you how much money for development or government is trying to train people to be farmers, to try to train people to be farmers. Once the main parameters, this of our association and this workshop that we did with Mutizwa was that it was based on what we did with EMO. We are selling vegetables from people that are producing vegetables and none of them has received training whatsoever. They are producers, they have been not been trained to be producers. It is simply out of their initiatives; in their hearts they know that they are growing fresh organic vegetables. And these are the type of people that we want to look at and so if you are going to lobby government on how certainly we have to go that route.

RZ: But you say stop and before we ...

BM: Such a large undertaking what we are undertaking. We have been offered funding by X that was at the workshop. They have offered EM funding through Rotary for het to do, to develop their project down the south coast, with the Green growers association. And we had to say to them no we don't want funding now and do it according, within the parameters of what he is suggesting now and straight away now, you know, we haven't actually got to the ideal situation. It is at this point that EM hit a wall putting way a lot of energy into getting frustrated that is not coming right and suddenly realising it, okay patience and allow it to happen and Mutizwa you have been doing this for a long time now. And I mean you made the comment of how much, how far we have got already because you are looking at from an objective point of view. You have seen things build up. You know the dynamics when you are working with groups of people and communities and producers and things like that. It doesn't happen like that. When you work with individuals' things can happen like that. When you work with family, things can happen light that but as soon as you develop that social structure, it becomes a lot more complex and rushing it can easily become the death of it. Because the people get overwhelmed, overworked, frustrated, de-motivated.

Researcher: They burn out.

BM: Burn out, all because of unreal expectations of how this thing, where it should be by now.

RZ: It will take its own course

BM: EM and I have full time jobs, both of us. You have got your full time reality here. You know for me to get you out to our farm for those two days you had to take time out of things that you were doing. And there things all take time. So with the government lobbying and that if you are down here in Durban, maybe you would be able to go and check these things

for us, because EM and I, we are working at full capacity. That's... but it does take time but we are definitely moving along. Like one of the things you mentioned right at the beginning of this week is to keep the momentum. One of the things that EM said to me at the beginning of this week is that she has had enough. She is burnt out. She doesn't want to know about it. And one of the things about this visit is that I am re-inspired I see where I can play a part in it and there are a few things that I need to do. So EM can take a bit of rest.

RZ: It is a really, it is relay [laughter] [sounds a bit like a networked system not having a permanent centre]

BM: Okay

RZ: Hand me that stick [sound more like the leadership, the opportunity] and I just go and be just be there and see if there is something I can pick up.

BM: When I mentioned to you at the workshop when I said to you don't you want to be on the board of trustees with this thing, what did you say to me?

RZ: I thought it was okay. Why? Did you get some negative impression?

BM: I am sure you had some reservations about something?

RZ: No.

BM: Eh

RZ: No.

BM: Strange.

RZ: No not at all.

Researcher: I think that is a very good point at which to end this. Thank you very much.

BM: You will be receiving an invitation from me shortly [Laughter].

4. Case Study 3: Lesotho case record

4.1 INTRODUCTION

The third Case Study was based on the Machobane Farming System (MFS) in Lesotho. It focused on the work of MFS farmers in two districts of Lesotho – Mafeteng and Mohale's Hoek and the MFS supporting organisations: Machobane Agricultural Development Foundation (MADF) and the Rural Self Development Association (RSDA). In the second phase of the study, government agricultural extension officers in Mafeteng district joined the MFS facilitators and farmers in the research journey and contributed through participation during and after the CL workshop. The study in Case Study 3 began in May 2008 through negotiating access and ended in November 2009 when we held feedback meetings and interviews and I left the field.

4.2 EVIDENCE OF NEGOTIATING ACCESS

On Thu, 31/7/08, Mutizwa Mukute <mmukute@yahoo.co.uk> wrote:

From: Mutizwa Mukute <mmukute@yahoo.co.uk>

Subject: Re: Fw: Request to partner with RSDA in a research journey

To: "Mampho Thulo" <thulom@rsda.org.ls>

Cc: H.Lotz@ru.ac.za

Date: Thursday, 31 July, 2008, 10:00 AM

Dear Me' Thulo

Greetings again from South Africa. And many thanks for agreeing to work with me in the research process.

You want to know how much it would take you to participating in and support the process. I can only answer this to an extent because a lot will depend on how things unfold on the ground. My proposal would be that I visit you sometime in September, perhaps in the 3rd week so that we can discuss the entire process. I could also take the time to carry out the in depth interviews, focus group discussions and document analysis (and possibly observe how farmers learn).

What I can say at the moment is that I would need:

- 1. To have access on literature about the MFS in general*
- 2. Information about how you have been working with farmers who practice the MFS (organisational documentation)*
- 3. To attend at least three sessions in which you facilitate the learning of the MFS. I would like to do this during a normal and scheduled farmer training, whether you do it in the field or at your centre that would be fine.*
- 4. To interview two development facilitators concerning the learning and practice of the MFS, preferably from your organisation.*
- 5. To interview farmers practising MFS. It would be good if one of them has done farmer to farmer extension but not necessary.*
- 6. To hold a focus group discussion with a group of farmers who learn and practice MFS together.*

The most efficient way of carrying out this first part of the process would be to link it with a training programme that you have already scheduled. This means that the proposed third week of September might not be suitable. However, I could come for an initial period of two days or so during which we can work out the process.

After carrying out the above process I would leave and carry out an analysis of the findings, which will concentrate on how farmers learn MFS, and well as the limitations they may be facing within it or as a result of contextual developments. I will then make arrangements with you to come back and present the findings. I would propose to present them to all the participants who were involved. Part of the reason for the presentation would be to cross-check the correctness of the analysis. The other reason would be to use part of the analysis, especially the limitations and contradictions in order to develop conceptual tools that would address them. This would be done in a workshop using activity theory, which I would also explain then. Once the conceptual tools are developed (over a day or two), we would invite a larger group of MFS practitioners to examine the proposed solutions to some of their issues. We are talking of three days of workshopping. They may be spread over a week to allow for reflection.

All in all I would need your time, your logistical support to arrange meetings, interviews and workshops and to bring the farmers together (and back to their homes). You probably have a rough idea of how long we would interact. This will probably be over six months or so but effectively about two weeks.

I had originally planned to work with two case studies per country (Lesotho, SA and Zimbabwe) but have revised this to one per country to allow for depth. This means that I would be working with your organisation only in Lesotho. However, I could hold an interview or two with other promoters if necessary.

Once again many thanks for your positive response. I would still be happy to come and chat about the study in September and do some of the preliminary work. Please let me know how you feel about the whole process.

I am copying this communication to my supervisor for her information.

Mutizwa

4.3 SAMPLE INTERVIEWS

4.3.1 Sample interview with MFS farmers (Interview #L1)

MM: Now I am at Rhodes University and I am doing a study where I am looking at how farmers are learning and practising different sustainable agricultural practices, which include MFS [pauses for translation to happen]. So the reason why I have come here is to try and understand how you are practising the MFS and the problems you are facing and the benefits you are getting from it [pauses]. So I would like to thank you very much for making the time to meet me and have this discussion. So I would like to ask for permission to record this discussion on this machine.

Le-Farmers: It's okay.

MM: Thank you. Maybe, when did you start practising the MFS and why?

Le-Farmers: We started the MFS in 1995, with the main purpose of driving out hunger.

MM: What do you like about the MFS?

Le-Farmers: One of the benefits is that we use kraal manure and ash, which we don't buy.

MM: Are there any other benefits?

Le-Farmers: From the system itself, the kraal manure holds moisture which becomes available to the plant and then gives good yield.

MM: How did you learn the MFS?

Le-Farmers: We learnt the MFS from RSDA.

MM: How were you taught?

Le-Farmers: There was training where we were taught how to plant maize, sorghum, beans together in the same field.

MM: Did the teaching, did the farmer go to town or did RSDA come here? And what methods of teaching were used?

Le-Farmers: What happened is that RSDA came to groups in different villages and their role was to collect all the materials together alert all the farmers to come together and then they would be taught how to do the system.

MM: Okay what sort of material? Is it seed?

Le-Farmers: The materials that we have to collect include kraal manure, ash, grasses and compost.

MM: How long was the training?

Le-Farmers: The trainings were designed in terms of the planting season, if it was time for beans, and then the extension would come, in times of planting vegetables, in different types of soil. So it wasn't fixed, the training will take just a day or so.

MM: Over how many seasons or years did the training take place before they felt confident?

Le-Farmers: Since 1995 to 2000 there was some training. From 2000, that when they had to stand on their own. That is when they started growing seed.

MM: When you were trained in the beginning, how many were you? You said you are 18 now.

Le-Farmers: Up to 40.

MM: And since when have you been 18?

Le-Farmers: Only last year.

MM: What happened to the other 22?

Le-Farmers: We used to be provided with inputs and when those inputs stopped and we had to provide our own, then they pulled out.

MM: So that was in 2000 or earlier than that?

Le-Farmers: Since 2000 that's when they were given inputs as a group but from 2000, there was a selection of people who were supposed to grow seed. And there were four chosen from each village so that is when other people stopped.

MM: What were the other reasons why some people pulled out?

Le-Farmers: The issue of inputs was the main reason because that is when we started to take from our pockets and some don't even have anything to take from so they had to pull out.

MM: There is no other reason?

Le-Farmers: There is no other reason.

MM: During the training, what did you find difficult to learn?

Le-Farmers: The main difficult thing was labour. It was labour intensive but there was a solution proposed, of using animals, in terms of planting.

MM: Are there any other difficulties you are facing in terms of practising MFS?

Le-Farmers: The prices of inputs have gone up. That's the main hindrance and these climatic conditions, it's too dry but besides that you see some [inaudible] that people are trying to farm but the prices of the inputs, they are no longer affordable. This and the climatic conditions are the main problems.

MM: When the prices of the inputs go up, what about the prices of the things they sell? Doesn't that cancel each other out [interruption]? My question was, the price of inputs, does that not get compensated by the price of produce that they sell?

Le-Farmers: The people are not buying because they do not have any money even if they have produced. People have difficulty in terms of buying so it is difficult to cover up the costs of the inputs.

MM: So what do you do with the surplus?

Le-Farmers: The produce that we produce, some we eat, some is being bought by RSDA and some is being bought by few people in the villages. The larger quantity is the one that goes to RSDA.

MM: So my question was, when the price of inputs goes up, doesn't the price of produce also go up, whoever they sell it to?

Le-Farmers: Okay, because of the increase in prices, we are going to increase our sales [must have meant price], in terms of sales but we haven't started yet.

MM: Have you taught – do you each other farmers about the MFS?

Le-Farmers: Yes we do, we even invite others who are not members to come when we have visitors so that they can listen.

MM: And to they also practise the MFS?

Le-Farmers: Yes they are.

MM: Are they from this village or from other villages?

Le-Farmers: They are from the village and from outside the village.

MM: Now within the families, their individual families, do they also teach each other or train each other? And how do they do that?

Le-Farmers: We always within the families.

MM: How about the learning part of it? How do they learn how to double-dig, or to add manure or ash who teaches them?

Le-Farmers: We take responsibility of teaching the others.

MM: What kinds of things do you do together as a group and what kind of things do you do together, aah, do you do separately as families or as individuals?

Le-Farmers: As a group we work together, in terms of, when we control pests from the fields. We work together, we share medicines. Even when we are supposed to pay for somebody who is going for training, we collect money and he will bring information back to us.

MM: What kind of training have they sent someone to attend?

Le-Farmers: We normally have meetings as groups so we used to pay for somebody who will go for the seating [meeting]. The meeting is on a monthly basis. So we pay for the person who is going for the meeting.

MM: What kinds of things are discussed at the monthly meetings?

Le-Farmers: The things that we can point out are on drafting the constitution for the groups those are some of the issues that have been dealt with so that they can be in a position to register. Also they have paid for somebody would go for training on leadership even the issues of bookkeeping, how to handle books and that kind of stuff.

MM: How has the MFS improved their lives as individual farmers?

Le-Farmers: The MFS has helped us to have food for the family. We normally have water from the tanks which we are able to use.

MM: How about other farmers?

Le-Farmers: Since we have engaged in this system, we are able to have vegetables. We eat very well. We sell vegetables and we get money and we buy cooking oil from the Chinese [all laugh].

MM: Have you been able to raise enough money to buy properties, in the families?

Le-Farmers: Yes.

MM: Can we have examples of what you have bought?

Le-Farmers: From the system, I planted potatoes and out of those potatoes I managed to raise money of which I used to buy the roofing materials for this house. Ntate is the husband of Me' so he is going to say the same. From the system itself, I managed to raise funds of which I managed to buy chickens, from the chickens I was able to sell.

MM: Do your children like agriculture in general or do they like MFS or both?

Le-Farmers: Those who are residing here, because most of them who are residing here, because most of them are not residing in this village. So those who are still here, we have taught them. And then we hope they like it.

MM: What else do you, are there any other difficulties you find in practising the MFS?

Le-Farmers: There is no difficult except this one of drought. The other aspect is of the increasing prices of the seed which are being used in the system. We have knowledge about the farming but the problem is the prices of the inputs, we can't afford to buy.

MM: Okay, that seems like a serious problem. Are there any experiments or innovations that some of the farmers have done, in the, when they are practising the MFS?

Le-Farmers: Yes, there have been experiments.

MM: Okay, can we have experiments of which ones were tried and what the results were?

Le-Farmers: When we were taught how to plant, we were taught that the space between the potatoes, you have to measure it, and then to measure it you have to bend down. And then we felt that we cannot manage anymore because of backache and then we just size with some hoes so as to make it easy and simpler, so that we can't [don't] bend down every time we planted [interviewer laughs], especially the sowing of potatoes.

MM: Aaah that's good any other innovations?

Le-Farmers: To cut on the labour-intensiveness of the system, when you plant potatoes also you have to dig the holes with a spade, you are supposed to do that as recommended in the system but we saw that it is difficult and it takes time. Then we use strings to mark the lines and then we use the mono-plough to open up furrow so that we can put potatoes and cover the soil [interviewer laughs]. Instead of digging the holes, we just open up the furrows using animals.

MM: Me' you were saying something.

Le-Farmers: To cut also on the intensiveness of the labour that you need to put into the system, I use all my kids to open up furrows so that we can work more faster and easier. And we are very successful. We were so successful with those potatoes I even managed to take some pockets to one of my children to sell of which in turn I was even able to pay for books.

MM: Now in the families are there any duties that are done by, farming duties by men, others by women others by children or it doesn't matter?

Le-Farmers: No there is no division, even the cooking can be done by anybody, even when the man is in the field, he can bring in the firewood, or so that they can, even to collect water can be done by everyone.

MM: Is that true?

Le-Farmers: Yes.

MM: That is good [all laugh].

Le-Farmers: The system is too labour intensive. If you have to do it on your own, it will be even more difficult. So you have to share.

MM: So what kind of support do you expect from RSDA as far as the MFS is concerned?

Le-Farmers: Because the planting season is too short, so the kraal manure and the ash, they are good in terms of holding on water even to make good plants but they take time to be ready while fertilizer makes them grow quicker. So we can have support from RSDA of fertilizer so that we can put in fertilizer together with manure in the system so that we can harvest, especially this time, because the time has already gone. We were supposed to have put in manure in the soil by now. So with the weather that is, this kind of climate, we will be able to plant in November, which will be late for us. So if we have fertilizer, we can also speed up the growth of the plants so that we can have a harvest.

MM: Anything else?

Le-Farmers: If we can also be helped with some hoses so that we can irrigate in our vegetable gardens that would be great. And Ntate also talked about the control of pests from the field that could be assistance from the organisation. We also request some assistance in terms of tank constructions as some of us don't have. It's only few who managed to have access to water harvesting tanks. So if we call all have the tanks that would be great.

MM: The reason I am asking this question is not because RSDA will come with the support but I am still trying to understand some of your problems, which you didn't say when I asked a direct question about your problems. What do your neighbours say about the MFS, those who are not practising it?

Le-Farmers: Most people are complaining about the labour intensiveness of the system. It is labour intensive.

LS: I was asking whether, they have found to try and make work easier, in the system, why didn't these people join [farmers laugh]. Why didn't they join if when after realising, finding ways of achieving a cheaper system and easier, they said some people are lazy and they don't want to work? Even though they realise there is some ways that can be done to make work easier, they don't want to work.

MM: What do you think should be changed about the MFS or in the MFS?

Le-Farmers: We have already changed the system as we are no longer using our hands, in terms of soil, we can use animals.

MM: There are not other changes that you are thinking of?

Le-Farmers: One of the things that we want, eeh, and our soils have this Kikuyu grass of which we want to get rid of so it's more related to what we want.

MM: What kind of grass is that?

LS: The Kikuyu grass. I will show you the example. That is the kind of grass that we have there [pointing]. We will get a sample.

MM: Okay.

Le-Farmers: Ooh, okay. The relationship is that we have this Kikuyu grass, which makes it difficult in terms of hoeing. So if we can use herbicides to kill this grass, make work more easier in the system.

MM: Do you find any difference in terms of taste between the food that you produce in the MFS and that in the conventional system?

Le-Farmers: There is not much difference in terms of taste. But the quantities that is being used differ. If I want to make mealie meal I would use small quantities from the MFS and a bigger quantity from the commercial.

MM: Ooh is that so?

SK: So that is the difference.

MM: What other comments do you have about the MFS?

Le-Farmers: Okay, what we can say about the MFS is that it is good because you cannot differentiate between the ones who have and those who don't have. It's true that the MFS we don't get much yield as conventional agriculture but at least we have food to put on the table.

MM: Any other comments?

Le-Farmers: Ntate is happy with what Me' has already said that some of us are very poor but in the system, you cannot notice the difference because we all have something to bring on the table. We go to the fields, we have means no difference between the poor and those who have something.

MM: What kind of extension services do you get from government?

Le-Farmers: There was a donation from the government, last year where we received fertilizers and some inputs. Each person received 500 maloti worth of vouchers from the Ministry. So with that voucher, they managed to buy seed, fertilizers and some of the farming implements. So that is the assistance they got from the Ministry. Some of us didn't ... the 500 worth voucher because it can only buy one bag of fertilizer.

MM: Where did you learn about herbicides, you talked about needing them?

Le-Farmers: We learnt that from Ntate Matava, who is also from RSDA and how to use those herbicides.

MM: I would like to thank you very much for the discussion. If you have something to say, you can say it [pause for translation]. I would also like to wish you the best in your farming activities.

LS: They can also ask me. I shouldn't be in a hurry, they are still thinking.

MM: Okay, that is a good one.

LS: I am telling them about the programme it's coming again, next week Monday.

MM: What were you talking about?

LS: We were talking about the input trade fairs. There is no clear indication of the difference between, we have a programme on block farming, we have this input trade fairs. So there was no clear difference between the two. So I was trying to differentiate between the two programmes because they are both from government. The input trade fairs is the government-FAO. Actually it is a kind of emergency response from FAO. So it is working through the government, the Ministry of Agriculture. The block farming is the programme of the government of the Ministry of Agriculture. So in block farming you have to appoint some fields which are close together. So one person has to be in charge of all the fields and those fields will plant just one crop. If it is maize, it's maize, if it's wheat, it's wheat. So this input trade fairs, everyone will buy his own seed. Different, if you want seed, you buy seed, if you want fertilizer, it doesn't matter what input you want but you have to buy.

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Le-Farmers: We are not saying conventional agriculture can be better than MFS. What we are saying is the use of organic manure needs time but if you plant on time, you get better results but if you are not on time – that's why we need chemical fertilizer because it can push more faster than organic manure. The organic manure will be slow, so that is the difference. The difference is on time not that one is better than the other one.

MM: Then another example of issues that I can mention is when I talked to Dr Ralitsole, he said one of the main problems with comparing production is that most farmers just look at the output, they don't look at the cost. So for example, if your bag of fertilizer is, cost you 500 maloti and you harvest a little bit more but that more is not justified by the additional costs, people don't factor that in their accounting so they still think it is much better to be using [conventional farming] even though the costs are much higher [pause for translation] Lastly the other thing that I am interested in is to find the very good things that are in MFS, the very

good things that are in other sustainable agriculture practices such as Permaculture and organic farming and look at ways that they could feed into each other.

Le-Farmers: We wanted to show you the seeds [produce containers with different varieties of seed].

MM: Okay, thank you very much.

Le-Farmers: We have maize, sorghum, and the names are different even the shapes are different.

MM: Is the seed that you are producing to be sold?

Le-Farmers: Yes

MM: How do you select seed?

Le-Farmers: When one is smaller and the other one is bigger, you can also plant, so the middle one is the right one.

MM: Do you choose the seed from the way the plant looks of you or it doesn't matter you just look at the size of the cob?

Le-Farmers: We monitor the plant until it is harvest time but. Me' is demonstrating the areas, if we have the whole field, we measure 5 feet into the field from both ends. So in the middle, that is where we are going to select our seed because we want to avoid contamination with the other fields adjacent to the one we planted for seed.

MM: So is this more expensive than selling ordinary grain?

Le-Farmers: Yes.

MM: By how much, say they were selling 10 kg of seed and 10 kg of grain. How much would they compare in terms of price?

Le-Farmers: If I sell grain it goes for 60 rand but if I sell seed of the same quantity, it is 120 rand. So it is double [all laugh].

MM: I am very impressed by what you are doing. So which other seed do you plan to harvest seed from for sale?

Le-Farmers: The crops that we are looking at are wheat, pumpkins, and beans.

MM: Why are you involved in seed production or seed multiplication?

Le-Farmers: Eeh, access to seed in the neighbourhood, we shouldn't go far away into town.

MM: Okay, is there anything from your traditional farming practices that you are using today.

LS: Traditional?

MM: Traditional, yes.

Le-Farmers: We are still broadcasting [seed]. What we do is that we have things which we pick from the field and then we put it in the bottle and we put some, if it's stalk borer or whatever. And the worms that we put in there won't eat the maize. They don't want to say what they put in the bottle.

MM: Okay, okay, that is fine. I don't know if there is anything else they want to ask or add.

Le-Farmers: Are you satisfied that is the question they are asking you?

MM: Yes, very much and very thankful as well.

4.3.2 Sample interview with MFS facilitator (Interview #L6)

MM: I am doing research that is trying to look at how people learn and practice sustainable agriculture – different types of sustainable agricultural practices, with a view to looking at how the learning can be improved, and the practices, how they can also be improved in the process. So I am doing three cases studies, one is in Zimbabwe, which is looking at Permaculture. That is what I was talking about yesterday, Permaculture in schools but it's also practised outside schools. Then in South Africa, I am looking at organic farming because that seems to be the major thrust. Then here, I am looking at the MFS. So I will e-mail again the stuff and could you please give me your e-mail address? But it must be the correct one if

you got some of my communication. So I wanted to find out how you got involved in the MFS and when?

SR: Now that is something. Should I start?

MM: Yes.

SR: I got involved in the MFS in 1987, that was when I came back home from doing my studies in Bulgaria, my PhD in Plant Protection. When I came back home I looked for my former teacher, history teacher. He is late now, Dr. Tamane, just to talk with him and to seek advice. When I met him, he immediately told me about; he asked me what I did at school, at university. And I told him. He said now you have to see this man – eeh J.J. Machobane [both laugh]. Fortunately I had heard about him in the sixties before I left. I had heard him in connection with potatoes. He was doing wonderful things. ‘The government is against him. He is doing the wrong thing’ – this and that, you know, confused information about him. But what made me go to see Dr Tamane was the experience that I got when I was abroad.

MM: Okay

SR: I visited quite a good number of countries before I finally did my PhD in Bulgaria. The reason being it was that time when things were not very good politically here, both in Lesotho and in South Africa, the Republic. So we were like refugees. So we went from one country to another. But each country I visited, I met with the local people and all of them were very proud about what they had achieved as a nation, as a people and almost all of them, all the countries said something. The French said they had the best country in the world. The grapes. The Bulgarians told me that they had the best bacteria – Placto bacteria bularico – that one that changes milk into sour milk. Yes, it is very good. They were very proud about it. It’s true that they do not manufacture it. They have it because of their climate. But they were so proud of it. And when I went to Greece they talked about being the cradle of civilisation. And all this inspired me to try and find out, ‘what can we be proud of as Basotho?’ We have to find our own people, too, in a very good mood, not that we want to be better than others but I thought we should have something too, to talk about, to people who come to visit our countries. That we have this, we have beautiful mountains. We have that and that. So the first thing when I came back, I looked for Ntate Tamane as an historian and he directed me straight to Dr Machobane. I went to Dr Machobane and from then on we worked together until his very last days. Actually I was fortunate that the last year of his life, we used to spend days ... yes, just the two of us. Him talking to me, I ask him questions and was a very jocular person. Very humble. The most important thing about me that surprised me was his humbleness. You could never think that this is the man who has written so many books. This is the man who has come with a new farming system. This is the man, with his little education, who has come up with this farming system. That’s how I came to know about Machobane. And I was also keen to find out, ‘what else can we do for ourselves as Basotho other than looking for donations from time to time, from outside?’ I was very much disappointed also to hear people talking about us, us as Africans from the continent as people who had nothing, people who cannot do anything for themselves although they were not saying it as directly as I am saying it now but it was implied. And that, it did not me alone but us as Africans, we realised that and we were not happy with it. So I thought maybe when I come back home I should find something ... and that we can use to improve the lot of our people. So when I met with Dr Machobane and I asked him now, and how he came out with the MFS, I was highly impressed.

MM: Okay, what would you say are the special features, what is unique about the MFS?

SR: Special about the MFS is that the system was formed in Lesotho under the conditions, the Lesotho climatic conditions, solely to address the lot of the people especially in the rural areas, for them to be able to use what they have around them. Actually that is the essence of

the MFS. Use what you have around you to improve your well being. That is outstanding as far as I am concerned, as far as Machobane the farming system is concerned. Because I had learnt from outside that you get this from America, you get that from Japan, you combine these things and then you can improve your lot in Lesotho. But it doesn't work like that.

MM: Now, as someone with a very strong and deep background in Agriculture, what kind of difficulties did you find in accepting the MFS – before you went to Bulgaria and afterwards?

SR: Before I went to Bulgaria, there was a general impression given to us by the powers that be, yes, and the government – that the MFS was primitive. It was very primitive. ‘This man was sending us back to where we came from’ [both laugh]. So my impression, although it was not well-founded, but it was just what we heard from government, the officials, and the extension officers then. They were so much against it that we were not, even the teachers, were not allowed to talk about it at school. It was almost like a crime. So my impression, even though it was not fixed that the MFS is not good, but I got worried somehow, why is it not good but my knowledge of it then was not enough for me to say, to make a judgement. So I had that impression that this man was sending us back to where we came from 100 years ago. But when I went to Europe, as I said, I found people proud of what they began in their respective countries, respective villages. And they were proud of it. Even in western classrooms where we were taught this kind of education. People, the lecturers continued to talk about what they had achieved, at home, in the villages. So that made me think too as I have already mentioned, made me think maybe this Machobane system, let us see whether we cannot improve it, when we get back home.

MM: Now, were there any challenges in learning it?

SR: Well yes, challenges were there. The first challenge was that I had a formal education. I had a PhD in Plant Protection. I knew that and all of a sudden I find someone doing something almost entirely different from what I learnt. That I found very challenging. But with the background that I wanted to do something that is originally from Lesotho, I accepted it. The challenge to me was to see maybe how this thing ticks, the MFS.

MM: Okay, what makes it tick?

SR: What makes it tick, yes? The MFS.

MM: So do you have an answer to that now, what makes it tick?

SR: Eeh, not quite. But I can say it work because it is meant for people, ordinary people, especially ordinary poor people. They seem to attach themselves, their way of living to this kind of system, especially because in the MFS, you find some things that are taken from their culture, yes, the African culture ... And once we identify these people we make it a point that we go back to them and give them more of the MFS, so that in turn, they become tutors among the local people. And that is practised in the Lesotho cultural practices, especially for the men who are going to, what do you call it?

MM: Circumcision?

SR: Circumcision. When they are there they are also identified by their respective teachers, eeh trainers. You find that this one has got some leadership skills. And then they are chosen. Actually they are trained all of them but among them, there are few that are seen to be better than others. So the MFS, they took from that. There is another thing that is called matsema – collective working in the villages. For example, during harvest time, people, local people help each other. We go to your field and then once we are through with your field, we go to another field. Yes, they call it matsema. That also is incorporated in the MFS. And helping each other, ‘you have been helped, so help others too’. Yes, that is the policy of the MFS.

MM: I found that somewhere the word ‘disciples’ has been used to describe tutors, what is the connection?

SR: The connection, the connection is the first people who were taught MFS, after J.J. Machobane had perfected it, after he had researched on it and was quite certain that it works, after 13 years of research, the first group of people he taught, they were 12, like Jesus' so they we called disciples. Just because of that number. Yes.

MM: Now among your intellectual and academic friends, have you not encountered some who challenge you for working with the MFS?

SR: Indeed, when I was principal at the college, Lesotho Agricultural College, I started talking about the MFS to my students, just talking like that, even taking them for practicals on my own, in my own time, without interfering with the school curriculum, because we had one system called Student Enterprise Project. So I used to take those who were in the project, the Student Enterprise Project and show them the MFS techniques. Now one day we had a meeting with our colleagues at the National University of Lesotho – because we were affiliated, the agricultural college is affiliated to the university. And we had a general meeting about how agriculture is being taught. Now some of my students were in that meeting. And they asked, 'why is it that we do not practice the MFS?' There is a colleague of mine who is a professor, Professor. He jumped. He was chairman of the meeting. He jumped and said, 'Look, we have not come here to play. We have come to discuss serious matters about agriculture' [both laugh]. 'After all, do you have evidence to show that this thing you are talking about works?' And he cut him there. I didn't want to enter into argument. I had to follow protocol. That was that. But when we were outside I asked him, 'But why did you burst out like that when a student was asking a genuine question like that?' He said, 'No, no, no he cannot waste our time by asking such stupid questions.' I said how do you know that this thing does not work? And he said, 'Can you show me any scientific proof?' So I left him. I left him. I also worked at the institute of research, from the Lesotho agricultural college I was transferred to the Director or Research – Department of Research. I thought there I could easily practice MFS – to research on it, find what makes it tick [both laugh]. But even there I was rebuffed by fellow researchers.

MM: When was that?

SR: That was 96, 96-97. Yes. Even then I was rebuffed. They didn't want to hear anything about the MFS. They reiterated what we had heard before we went to school – it was primitive. So I had that challenge among the people that I thought would be more understanding.

MM: How have you tried to resolve that? How are you responding?

SR: Fortunately, the system really works. It defends itself, provided you practise it properly. People keep on talking about it, even Radio Lesotho, although the Ministry of Agriculture was against it. But people keep on asking. Sometimes the Ministry of Agriculture, especially the Information Centre, they go to local farmers and those who are doing well in their farming methods, ask them what they ... on the radio and they say, 'no I practise the MFS'. Some even say, 'no, we were taught by Dr Machobane that this thing should be done like this, like this.' It proves itself from time to time.

MM: What would you say are the strengths and the weaknesses of the system?

SR: Yes, eeh, the weakness of the system is that it is based on the use of kraal manure and wood ash. Now there is a shortage of these two – a great shortage. Animals are now very few in Lesotho than they used to be at the time because of theft, because of bad agricultural practices. They die, they do that and that. Wood ash, people are not using wood any more [interviewer laughs].

MM: You have electrified your rural areas?

SR: Yes, they are not using wood. There is lack of wood ash. And people if they have it, they do not want to use it. One other thing is about wood ash is that it is the practice of the

Basotho since time immemorial when then bury – when babies die, they bury them where they throw their wood ash. So they don't want it touched. It's a grave – a respected place. It is just next to where they leave. So it is difficult to get wood ash. But the main thing is that people are not using wood any more.

MM: For energy?

SR: For energy. So there is a shortage of that, especially in towns.

MM: So what is the replacement, the substitute for wood ash?

SR: Yes, now you come to the substitute. That is why I am working on these three substitutes, organic matter that we are doing now – solely to cover the shortage of kraal manure and wood ash. So that people continue using organic methods of [production]. And you see it seems to be working, at least here where we are researching on it.

MM: I noticed yesterday.

SR: It seems to be working. So once we get that right we go back to the people and show them how to use it. It's very easy and it's very cheap.

MM: What other improvements have you made recently in the system and what other improvements were made before you got involved – are you aware of either in terms of technologies or ...? In terms of how it's taught in terms of how it's practised. Overtime.

SR: Ooh yes. When I first arrived or when I first learnt about MFS in detail, it was mainly practised on fields – bigger fields outside the village – outside your home. Now the improvement is that they practise it even in the backyards. That is a very big improvement.

MM: How old is that improvement?

SR: It's quite some time now, maybe 10-15 years. But now it is even more. We are actually emphasising as the MFS, especially with this fearful disease HIV and AIDS, in conjunction with the Ministry of Health, that people should take nutritious food, fresh food and all that. They must produce without synthetic fertilizers. Now we are concentrating on home gardening. You see, this is the improvement. Another improvement is that, people, we are advising them that they must use different types of vegetables. We are adding more vegetables, introducing more vegetables in [tea is served].

MM: Which new vegetables have you introduced?

SR: The collards, the beetroots, the carrots. They are actually not new per se, especially in the towns but in the villages they used only local. So we have introduced that. And also the new introduction is that they must not only grow vegetables for home consumption, they must also think of selling. That's the new introduction, which fortunately you were there when we talked about the economic. So those are the new things that have been introduced to the MFS. But that does not mean that when Machobane brought the system he did not think about that. He did. He did think about people being able to satisfy their needs, home needs but also to be able to sell and later be able to send their children to school and buy them the school uniforms. That's why the potato. He had researched on the potato. He saw its strengths as a crop that can satisfy the people, especially to be able to buy things for themselves and also to sell, to generate some income. What we now introduce is to use modern ways of trade, to introduce to the people, how they should sell their potatoes or whatever they produce in the sense that they must unite and form cooperatives or something like that. So that when they produce it is something sizeable.

MM: Are there any physical tools that are peculiar to the systems that are generally only used to the system that were developed through the system?

SR: One other that, when you asked about what is so special about the MFS, is the use of locally available materials. When it comes to tools, it is the use of your hands *{This is an interesting point to note in relation to Vygotsky's mediation and his seeing of tools of mediation as and indicated of human advancement – might resonate with fears of*

backwardness}. Especially measuring, they use their hands, like this, like this, like that [demonstrating] – maybe when they want to determine the distance between the plants or rows, they use the length of a spade which is plus or minus a metre. They used their fists and their hands. That was because he knew people would not be able to buy those things themselves. The MFS was made especially for the poorest of the poor – so he practised those things himself when he was doing research on the system.

MM: Are there any constraints that he is facing either in practising the system or learning the system?

SR: Yes, constraints in practising the system are when you go to family and talk about the MFS, how it can help. They listen to you and agree with you but because of the poverty situation of our people, they may agree with you 100 % but they want to get money immediately to support their children to send their children to school. Now with the system, we don't come and bring you money. We just tell you and show you how you can get money in the final analysis. They agree but it's very difficult for them to practice it – there and then. Maybe they say, let me go and find work somewhere first so that I get money and send my children to school and maybe with the spare amount that I have, I may start farming again. Yes, those are the constraints.

MM: And from the government's point of view, how much investment and support does the government give?

SR: No, absolutely none. But support, especially now, this building is government.

MM: Okay, that's good.

SR: Yes it given. We are fortunate in that the government has finally also accepted that the system is good for the people. So we are now working together in fighting, alleviating poverty in the country. We were allowed by the Ministry of Agriculture to teach the MFS. ... But they appreciate what we are trying to do. And we are fighting together to improve.

MM: What is it that you did to make government officials listen to you? And in a sense, accept the system?

SR: We continued to practise the MFS in spite of the ... And the Agricultural Radio Information [Programme] also helped us, albeit indirectly or unknowingly but asking farmers how they do, how they practise agriculture in the respective villages and plots. So the people kept on saying Machobane, Machobane, and Machobane all the time. And one other thing is that not only in Lesotho, do people talk about the MFS. They talk about it in Botswana. They talk about it in Zambia. I am told it is practised in Zimbabwe. Let me just ... a little bit and talk about the Machobane. It was in 2005, 2006, there was a workshop at in Johannesburg on Poverty Alleviation in SADC. I was fortunately invited. It was organised by the Kellogg Foundation. I was fortunately invited to represent Lesotho there. And to my surprise, I found Me'Joyce, the Deputy President there, from Zimbabwe there was Pumzile, Vice President, from South Africa. There was also a lady from Mozambique, from Mozambique. Now these three ladies were studying PhD. So we were asked to help them, no not to help them but to talk about our experiences in our respective countries. So we met a good number of delegates from [even as far as] Ghana and even across Europe. One was a mentor of Me'Pumzile, a professor. So I was surprised when I heard Me'Joyce saying _yes, we heard about this thing MFS'. And then I asked, _what is Machobane' that was later on. ... But I was very happy. In Botswana it is actually practised. But the snag is that they are not practising it as it was written by the author. Actually that is one of the difficulties we find in Lesotho here – the wrong practise of the MFS. We are in PELUM for example, we all practise the MFS – organic farming, it is the same thing but if you go there and see how they are practising there is some discrepancy and that is a short-coming.

MM: What are the common errors, discrepancies that you have noticed?

SR: Especially when it comes to the use of kraal manure and wood ash – the ratio, the proportion is not the same as practised. And ash, some of them just talk of ash, not wood ash, when they teach the people. For example I went to do a study for ... as a consultant there to see how they were teaching. They teach MFS, they train people but I found that they were not doing the right thing [interviewer laughs]. People were complaining that during this drought period you say we must use ash, they pour ash on their fields and if you pour ash only, they burn their crops. So there is that discrepancy. How you mix the two [kraal manure and wood ash], we are not together there.

MM: And why do you think that is the case? Why are people experiencing that?

SR: They are experiencing that because they do not know very well the MFS. Or maybe they read it in the papers that we were ... about the MFS. Without having come to us to ask, ‘look you are the custodian of the system’, we lived with the founder, the two trainers you met yesterday, and they lived with the founder for a long time. When I came back I found them already working with him, Dr Machobane. Me Norah actually lived with him for more than 20 years. So you see with that experience, we talk about the experience of working in the fields, the practical one. Not saying I read the things somewhere, you know what I mean. It doesn’t work.

MM: How do you, because one of the questions I have is, I used to work with PELUM, and one of the reasons why we established PELUM was to promote the successes that were happening in the region, which included the MFS but even then, there wasn’t enough spreading of the MFS as we had hoped compared say to Permaculture and I was just wondering whether you would ideas as to why the spreading of the MFS has not been as extensive as other sustainable agriculture practices.

SR: Yes, eeh most or the other agricultural practices are supported by certain organisations that have money and so they are able to buy implements and do that and that. For example, this thing that is practised by Dr Bassong – what do you call it? Agriculture what, what? He is supported. He has got funds and he can be able to go anywhere in Lesotho and demonstrate how the system works. And in that way and they are also given money. You come and you work and you will get so much. Even if it’s not money, they give them a bag of mealie meal or something like that. Now the people are poor. With us we don’t do that. We go there and they ask from which donor organisation do you come? If you say, ‘No I am not a donor, I do not come from a donor organisation, and I am a MuSotho’. They think you are wasting their time. They are hungry. There have been so many projects for example, that come to Lesotho, two-year projects like that and that and that. And all of them they come and bring something, to the villages. For those two years people will be getting some money, free seed. So when you come and say I want you to use OPV which you have, which can withstand the problems in Lesotho in your village ... even if they don’t think so. But they want to get something in it so in that way, the system was not able to grow as Dr Machobane wanted it to. Even now, I have just mentioned the World Vision. World Vision has transport everywhere. When they get there they say we are going to teach you have the MFS works and then they give them the wrong thing, in good faith. The challenge is for them to say let us look for the Machobane Development Foundation and talk to those people or talk to them to come and show us. We are mainly a training organisation on the MFS techniques. So the solution, especially as far as PELUM is concerned, we have discussed that with Moshe, I suggested to him that look, why don’t we, since we are a big association now, PELUM Lesotho – I think we are about 40 organisations or more. Now, they are all practising the MFS but it’s not the real one. Then I said look we have an advantage that we want to practice organic farming and we have the MFS, why don’t we organise ourselves in such a way that we as the MADF, we go to all, these other sister organisations and teach them how to do this? Yes, to do it with them – at a

price of course in order to buy petrol and all that and pay our trainers. We have agreed in principle.

MM: How much investment have you made into the development of manuals, field guides so that when you are not there, either in terms of other places or in future, so that people can still get the correct thing?

SR: We have done that. We have the manual for practitioners – both in Sesotho and in English.

MM: So this one carries enough of what should be taught?

SR: Yes. This one carries enough of what should be taught and it is simple. It is very simple.

MM: Now, a quick look at this manual also tells me that it is focusing on the techniques of farming but the way I understand the MFS, it's broader than that, it also moves into marketing, into mass education, the philosophy. Why, for example, is this particular manual, confined to the techniques only?

SR: Yes, because of the immediate need of the people to learn how to do things to feed themselves.

MM: Because I was wondering whether that is not part of the problem where people learn about the how but do not have enough appreciation of the why.

SR: They why. That is true but we wrote this book, this manual because of the demands made by the practitioners themselves. But what you are saying is quite right – that we have not covered all that which the MFS entails. No we haven't but now with time, I think we will do that. The Machobane philosophy, we had a Board meeting some time ago. I mentioned it to the Board members that wherever we go we talk of the Machobane philosophy but when we do research ... there is nowhere where we actually have the Machobane philosophy. It is there yes, we have the Machobane thoughts. Here we have, this book, Drive Out Hunger. We have other books that he has written but we have not combined these to come up with a solid Machobane Philosophy.

MM: Is this available for sale?

SR: Yes we have it here?

MM: That's great I will get a copy, how much is it?

SR: It's a 100 rand.

MM: I will get a copy and this the manual?

SR: The manual is 50.

MM: I will get both. Which are the other publications that you have?

SR: The other publications that we have are in Sesotho {remember context-specificity}

MM: So these are the two that you have in English?

SR: Yes these are the two that we have in English. Now this one we are talking of translating it into English. Here is the real MFS.

MM: It is actually good that you started with the local language and you are then translating into English, not the other way round. So when was this one published?

SR: This one, it is a long time ago. But it is about the thoughts of Machobane as far as behaviour is concerned, moral standards are concerned and you will be surprised that this gentleman, with his kind of education, how he could write something like this. I wasted my time doing PhD ... [both laugh].

MM: As head of the Foundation now, what legacy, or what changes do you want to effect in the near future?

SR: The immediate change is that we should get more young people. If you realised we are all about that age, which is not bad. We must get younger people now. If we get younger people, they will be able to disseminate much better, much faster because of their energy, younger people. This is my immediate wish to improve the Machobane Agricultural

Development Foundation. And secondly as I carry out research here on the system, I find that there are a good number of things that one could write about or research on, even for a PhD. And this could be done by ... and I am talking with, I have one young man I taught at the Forestry Department, and he likes the system very much and he comes and we discuss this thing. He has a Master's in Education degree so I am trying to lure him but it's not actually luring. He likes the system. He is also thinking, it is better if we improve this one of ours, bringing something from Australia. So this is my immediate wish yes. Unless, otherwise if we don't do this, we are going to go away and we go away with the system – especially the experience of these two trainers. It's so enormous. It's huge.

MM: S how do you intend to capture that and institutionalise it – the experience?

SR: Their experience?

MM: Yes.

SR: I have written a proposal about indigenous knowledge, which I think, especially now that even in the Ministry they talk of our customs, our culture, I think if I can have a niche in that thought of theirs of having something, especially from Lesotho, from Africa, we could bring that in. And that could help maybe fund wise. Maybe if the government could take it, the Ministry of Education could take it, and make it their own, I don't mind. I would be very happy so that we teach these young people about the MFS.

MM: What influence do you think that your presence and leadership of the organisation is going to have on the perceptions of people about the MFS?

SR: Fortunately, let me talk about the leaders, in government actually. Fortunately I know most of them. They know me and I have opportunity to meet with them when we are going for burials or something like that and discuss with them. The other day the Deputy Speaker of Parliament sent a message that he would like to see me. He is the former Minister in the Prime Minister's Office. He wanted to see me. We were together at school in Morija so I am able to talk freely with them. And when we went to bury Dr Machobane, the Prime Minister himself was there. He was there and he was very much impressed with Machobane works. And he also pleaded with the Machobane family that they must not throw this system away. It's ours. So that was a green light for The MFS. So we can easily go to them and talk about the MFS and influence them that we must get more time, we must get more funds and maybe even introduce it as part of the curriculum in the schools. That is one aim that we also have. Right now we are practising it at schools. If it can be accepted and established, it is going to be easy to ask the Ministry of Education, why don't you introduce it [in the curriculum], the thing is working. And it's ours. So I think that is the influence that we can have.

MM: Because I was coming from the point of view, okay that it was developed by someone who other people would not associate with academic education and now you are coming into the organisation with, as a PhD holder in the area of agriculture, so I am just wondering, what kind of impressions or perceptions this will create in the minds of other people. Are they likely to be easier to convince than in the past?

SR: Yes, very much so. I have a lot of students just across the Lesotho Agricultural College and colleagues at Agricultural Research. They always come here because they know Dr Ralitsole is doing this Machobane thing. Let's go and ask him. So there is now interest. That man has a PhD, we thought that thing was primitive, now look at him so it is doing it on itself, especially now as you rightly ask, with my PhD. Even in the Ministries, when I went there and looked for this place, I went to ask for it, and they look at me and they say, it must make sense – if this man wants it. So in that way yes, it has that influence, which leads to more acceptance of the MFS, when you find that there is someone like us. The university, by the way, the university that man I talked about, we went to a workshop in TY [Teyateyaneng

district] I was surprised when he showed his power point presentation. He talked about Machobane, Machobane, and Machobane. This is the man who said do not waste my time.

MM: Oooh that same professor [both laugh]?

SR: Yes, the very same one. I didn't remind him but I was so happy. So I think he taught about it. That was just a reaction maybe at that time. Afterwards he must have thought Dr Ralitsole, what does he want with this system? So I was happily surprised when he talked about Machobane.

MM: How many farmers practise the system?

SR: Oh no, off hand I can't tell you. But this thing is practised by local farmers, especially in the rural areas in all the six districts, aah the 10 districts, I am sorry, of Lesotho, except maybe Mochlotong – the mountain, yes. Because of their peculiar climate but then we have gone to discuss it, with some other NGOs there who are members of PELUM. And I think it can be practised there too, after we study the conditions. That is the most important thing. Now that is one constraint too with the MFS and with the other organisations: we don't research. There is no research. We just say we know the MFS and we dump it with the people. And that is unfair. That is one thing in some places that makes the MFS not even be accepted. Not to be popular. You come to tell us to put ash; we put ash all over the field and look at what has happened. And you see, the kind of ash they put there, it's not wood ash. They collect ash from all over the place. And yet you need a mix, and there must be a proportion, a certain ratio – depending on the kind of crop you are growing, potato, this, this, and this. It's not the same. So there you are.

MM: Now between these books, these manuals and this, there is a certain kind of knowledge that is not explicit that is there in the people whom I talked to yesterday and maybe among farmers, how do you bring that out so that other people and see and learn from it?

SR: Eeh I hope I understand, can you repeat the question?

MM: I am saying there is a lot of formally written material about the system, which is fair and fine but I think, in addition to that, there is certain tacit knowledge that exists in the farmers, in the tutors, in the technicians, in you and that existed in the late Machobane. How do you bring that out so that it gets shared?

SR: It gets shared, that's a very good question. We used to conduct workshops in all the places we have Machobane practitioners. Now our workshops are not like we are going to teach people what to do and Ntate Machobane emphasised that. You don't go and teach people, you go and discuss with people, about, we have a problem here. What can we do about it? So that is how we come to hear from them. One will come out, actually that's how we come to find out that this one can be a very good tutor – by his activity, his suggestions, everywhere, everywhere where we go, we practise that. We talk with the people: Look, we have a problem. We have drought. We have this. We have bagrada bug and insects, which are destroying vegetables in our gardens. What do we do about them? Now somebody will tell you, an old lady will tell you, I poured some soapy water. So that is how we come to gain, we also come out then with our experience, that we do it like this. So why don't we collect all the information we have and be able to – by the end of the workshop, we have written, all of us would have discussed. Anyone who wants to bring up how certain things have been done or how he has, he talks about it and so becomes part of the workshop, involved. That's what we learnt from Ntate Machobane.

MM: Now, if you were to rate the MFS in terms of its economic value and contribution, its environmental or ecological value, its social value, how would you rate each of these three out of 10 – the economic, the ecological and the social?

SR: Eeh, let me start with the social, the MFS talks and encourages and practises, matsema. In that way, it unites people who live in the same area and have the same problems, to work

together, to help each other. We always tell the people that you cannot solve your problems alone. You can't. It's either you do it with your family, you do it with your kith and kin, or you do it with your neighbour. That's social. And we advise them, encourage them, implore that they must not throw away the culture that we have, the good cultures that we have – the *Basotho MuSotho keMusuthu kavaSutho, kavave*. I think we have it in all our African languages – *A man is a man because of other men* [I am because you are], something like that. So that is how we do it socially. So socially it unites people together.

MM: So out of 10 how much would it score?

SR: Out of 10, I would score say 7, the social, yes. Now the economic one, which was the main reason why Ntate Machobane decided, to say let me sit down and see how we can help our own people to do things for themselves, to use locally available material for their own good, that is the first thing and also now to be able to produce more than the family needs so that you can be able to sell. Now we are encouraging them to do that. Now if you go, maybe if you are still going to Mafeteng, with Ntate Motsoane, you will find that the ladies that he is taking you to, they will tell you; because of this I was able to sell so many sacks of potatoes. Now, I was able to buy a cow. I am milking now, things like that. Economically, those who are practising it properly it is very good.

MM: So how much?

SR: Well, I would give it six, 6.5.

MM: And the ecological?

SR: The ecological take care of the basic natural resource. That's also a Machobane cornerstone, Machobane philosophy. Don't destroy what you use. Use it in such a way that next time, the next generation can be able to use it. We practise the rehabilitation of dongas, we tell the people to practice the growing of trees. Keeping the land always covered right through the year so that there is no erosion. Yes, that one we do practise but the results are not so good.

MM: Why is that?

SR: The people they are told and they don't implement or they do not do as they are told. Also there are these people now who come with all sorts of projects. They tell them do this, do that, do this, do that so that people end up leaving things just like that – getting confused.

MM: They get ambivalent messages?

SR: Yes that is right ambivalent messages. But as a teaching of the MFS, it's very good. Those who practise it, I would give eight, 8/10.

MM: Is there anything else you would like to say about the MFS in terms of how it is learnt, how it is taught, how it is practised? And how it can grow?

SR: The MFS has traversed a very difficult path, with the old man sometimes being chased by the government, almost like a refugee. He used to hide himself, run away from district to district. But he survived because he was working with people. People helped him a lot. I remember when I used to meet him the last years of his life. He was a man who could talk. He said, *_man I was lucky, wherever I would go I used to find a woman'* [both laugh]. So the MFS can be very successful in Lesotho, if it is practised properly. That is our main constraint – the good practice of the system itself. One other good thing about the MFS is that it is not against innovation. It is a product of innovation and you can innovate it anyway you like according to the need of the practitioner. So that is one thing very good with it, it can be improved on. Just now I am trying to introduce the compost – the new compost. I still use ash and kraal manure but not large quantities, because it is not there, so that we balance things up. That is the MFS. We are introducing new types of crops. But we found that the Basotho do not eat a variety of, are not used to a variety of vegetables. So we are introducing those varieties, those vegetables that take into consideration the conditions of the soil, drought yes.

We are trying to introduce drought tolerant and disease tolerant crops. Diseases, we don't have many because of the climate. They don't last long. But most of all, if we could come together as organisations, NGOs, especially those that are in agriculture to see how we can be able to use the principles of the MFS in our respective agricultural activities, then I think we can go far, very far indeed. Stop asking for donation from other people. We do not say we must not be helped when we are in need. But that must not be our way of living [interviewer laughs] because we have got too many, many of our fellow Basotho as the Machobane Foundation and the people won't accept us not because people do not accept us because they do not like us but because they are now used to being given. What are you bringing us? We are hungry. Some say that directly to us. We want food don't tell us about the MFS. We don't eat MFS. Yes that is the thing. Now one other thing, we are trying to inculcate among the children, the pupils that they must try to do things for themselves. They must be proud about themselves. The story I was telling you about myself and people, I tell them. That thing impressed me highly. I was even jealousy of these guys – they had something to say to foreigners.

MM: Why are you targeting primary school children?

SR: We targeted schools because we found the people working with adults for the past 20 years, even more, but progress is very slow for the reasons that I gave that people want to buy something to eat something immediately. Now, with the kids, we want them to grow with the system. The MFS should be part of their lives. They must not find it when they grow up when they go back home, they tell their mothers, they tell their grandmothers, I will do this, and that and that, on the ground. Now one other thing that we are missing – you were not asking, describing that the MFS is not only on these crops. There is mass education.

MM: Moving into specialised production.

SR: Yes moving into specialised production. Livestock production, we are not practising it yet because of our size but we want to expand. Actually, the MFS embraces all those activities, even the cultural ones, even handcrafts; it's there in the MFS.

MM: Off-farm, what do they call them, off-farm activities?

SR: Yes off-farm activities. One other thing, I didn't finish what I heard Me'Joyce saying they are practising of MFS. I have got to go and teach those people how the MFS is practised.

MM: That connection is necessary.

SR: Yes that connection is very necessary. I have got some books here that I got from PELUM about propagation of plants from Zimbabwe and I connect them very well with what we are doing here. I learnt so many things. About the building of compost, I read that too and I added my own things. Now I am going to call it Ralitsole Farming System! [both laugh]. So we need that information, that working together, networking. So that we improve, we can learn a lot. Me' Faku, you know her?

MM: Yes, the principal of an agricultural centre.

SR: She went to Botswana. She went to Botswana. Botswana is a desert virtually. When she went to Botswana to a certain institute there and she found everything there was green and different types of vegetables and flowers and everything. And she asked one of the ladies, can you please tell me so that I do these things when I get back to Lesotho. She said what? She said can you please tell me? And she said but I learnt them in your country [both laugh].

MM: That's a good one.

SR: So we can share things. We can really live better than now, especially down here, the ordinary people, we can come up with a very good system that can help our people broaden up a little bit.

MM: Thank you very much Ntate. Thank you Dr. The conversation was very rich.

SR: Thank Ntate, thank you very much too.

4.4 ANALYSIS OF INTERVIEWS

4.4.1 Sample analysis of individual interviews

Interview Code: L1	
Aspect of research	Evidence from interview
Object	<p>Food security _to drive out hunger;</p> <p>Income generation for the purchase of other household goods, –Since we have engaged in this system, we are able to have vegetables. We eat very well. We sell vegetables and we get money and we buy cooking oil from the Chinese.” Another farmer, –Fom the system, I planted potatoes and out of those potatoes I managed to raise money of which I used to buy the roofing materials for this house.”</p> <p>Equity, –Ok, what we can say about the MFS is that it is good because you cannot differentiate between the ones who have and those who don’t have.”</p> <p>Ecological, increased soil ability to hold water (which is getting scarcer)</p>
Tools (conceptual, physical and other people)	Intercropping; constitution (for group of farmers); leadership training; bookkeeping; seed; demonstrations; theory; planting calendar; meetings; workshops; indigenous knowledge (pest and disease control)
Rules (including policies, natural laws)	<p>Government subsidy system.</p> <p>Climate patterns.</p> <p>Soil quality.</p>
Community and power relations between them	<p>Most children are not residing in the village and this means that there are fewer youths who can learn MFS there.</p> <p>Government has the power to determine agricultural programmes without necessarily consulting the main stakeholders in the sector, especially farmers and there are commercial farmers and small scale farmers, conventional farmers and sustainable agriculture farmers.</p>
Division of labour including position and relations	<p>Heads of households and children participate in farming activities to share/ distribute the labour demands, –To cut also on the intensiveness of the labour that you need to put into the system, I use all my kids to open up furrows so that we can work more faster [sic] and easier.”</p> <p>There is no clear division of labour in families:</p> <p><i>Researcher: Now in the families are there any duties that are done by, farming duties by men, others by women others by children or it doesn’t matter?</i></p> <p><i>Farmers: No there is no division, even the cooking can be done by anybody, even when the man is in the field, he can bring in the firewood, or</i></p>

	<p><i>so that they can, even to collect water can be done by everyone.</i></p> <p><i>Researcher: Is that true?</i></p> <p><i>Farmers: Yes.</i></p>
Subjects	Farmers practising MFS (18 out of the original 40)
Contradictions and limitations	<p>Limited availability of seed in the districts where farming takes place – tools, level 1.</p> <p>Prices of inputs going up – Rules, level 1.</p> <p>Drought – Rules, level 1.</p> <p>Some farmers pulled out of the MFS when the programme stopped providing inputs such as seed – Subject-tools, level 2.</p> <p>Limited availability of household tanks for water harvesting – Tool, level 1.</p> <p>Other farmers pulled out of MFS when they were not selected to produce seed – Subject-rules, level 2.</p> <p>Labour intensive – Subject-tool, level 2.</p> <p>Lack of a ready market for some of the produce, –“The people are not buying because they do not have any money even if they have produced” – Rules-community, level 2.</p> <p>Having fewer youths in the community means that the object of sustainability is undermined – Community-object, level 2.</p> <p>The growing season is too short for the organic manure to support the fast growth of crops that is necessary in short growing seasons –“So if we have [chemical] fertilizer, we can also speed up the growth of the plants so that we can have a harvest — Rule-tool, level 2.</p> <p>Kikuyu grass which is seen as a difficult weed needing herbicides to get rid of – Tool-object, level 2 (because the proposed tool would go against the ecological sustainability object).</p> <p>The FAO which supports the input trade fairs serves as a tool producing activity that clashes with the MFS practice – Tool producing activity system, level 4.</p>
Relational agency	<p>Inviting MFS farmers from other village to attend MFS meetings when there are visitors helps build good relations among farmers in the same area</p> <p>Farmers work together in pest control and they share medicines (local pest and disease control materials).</p>
Habitus, identity and tacit knowledge	Use of some traditional muti where the pest concerned is mixed with muti in a bottle and then put in the field and this is believed to prevent such pests from eating crops in the field.

	<p>There appears to be some element of dependence syndrome with government having traditionally offered some forms of free support to farmers practising conventional farming and doing so now, and then the withdrawal of many farmers from the group when RSDA weaned them.</p>
Time-space considerations related to the practice / activity	<p>Training of farmers on crop production was based on the crops that were in season. In winter they were trained on how to plant winter crops and the same applied for spring, summer and autumn.</p> <p>Certain crops are raised during certain times of the year in certain places because of climate conditions – seasonality.</p> <p>It took group two farmers a total of five years to learn MFS and to feel comfortable to practise it without RSDA support, or with minimal knowledge support.</p> <p>It take (longer) time to plant potatoes and other seeds using hoes and less using draught power</p> <p>Crops grown using organic manure take longer to be ready for harvest than those on chemical fertilizer, — We are not saying conventional agriculture can be better than MFS. What we are saying is the use of organic manure needs time but if you plant on time, you get better results but if you are not on time – that’s why we need chemical fertilizer because it can push more faster than organic manure. The organic manure will be slow, so that is the difference.” (This may be a factor associated with the availability of nutrients such as nitrogen but could also be to do with the planting of short-season varieties)</p>
Motivation/Incentive	<p>Because system gives good yields.</p> <p>It is cheap and affordable, they do not buy ash and kraal manure.</p>
Structure-Agency relations	<p>The government promotes two agricultural schemes, the block farming and the input trade fairs, which tend to favour conventional farming and undermine MFS, thus reproducing the conventional agricultural system</p> <p>The formation of farmer groups alongside training in leadership, bookkeeping, has the potential to increase the clout of MFS farmers to organise themselves and challenge structures and systems that constrain their activities and practice.</p> <p>Intergovernmental structures such as the FAO which supports the input trade scheme carry symbolic power and are listened to by government officials. Their input trade fair scheme in Lesotho seems to be promoting conventional farming. Elsewhere they are reported to support Conservation Agriculture in the same country. It would be interesting to establish and compare the budgetary support that it offers to these systems of agriculture.</p>
Innovations	<p><u>Measuring distance between plants without bending down.</u> — When we were taught how to plant, we were taught that the space between the potatoes, you have to measure it, and then to measure it you have to bend down. And then we felt that we cannot manage anymore because of backache and then we just size with some hoes so as to make it easy and simpler, so that we can’t [don’t] bend down every time we planted [interviewer laughs], especially the sowing of potatoes.”</p> <p>From using a spade to dig holes to using mono-plough for making furrows,</p>

	<p>—“I cut on the labour-intensiveness of the system, when you plant potatoes also you have to dig the holes with a spade, you are supposed to do that as recommended in the system but we saw that it is difficult and it takes time. Then we use strings to mark the lines and then we use the mono-plough to open up furrow so that we can put potatoes and cover the soil [interviewer laughs]. Instead of digging the holes, we just open up the furrows using animals.”</p>
<p>Causal mechanisms</p> <ul style="list-style-type: none"> • Culture • Power relations • Environmental/ biophysical factors 	<p>Poverty, making people dependent on those who can provide free agricultural inputs, —“The issue of inputs was the main reason because that is when we started to take from our pockets and some don’t even have anything to take from so they had to pull out”</p> <p>Government has the economic power to support the kind of agriculture that it prefers as manifested in block farming and input trade fairs.</p> <p>The short or shrinking rain seasons are forcing some farmers to prefer agricultural practices that ensure early harvests. This in turn is attributed to climate change.</p> <p>Labour intensiveness has been attributed to unavailability of farm implements, which in turn is caused by lack of effective demand for such implement to warrant corporate investment in such ventures.</p> <p>The migration of youths and children into urban areas, away from rural areas where farming takes place can be seen as a response to the greater learning and employment opportunities found in urban areas compared to rural areas. This can also be further linked to the government policies on development.</p>
<p>Scores of ecological, economic and social value (out of 10)</p>	<p>Did not do scoring because I could not come up with an appropriate way of doing so in the group interview.</p>

4.4.2 Contradictions drawn from interviews in Case Study 3

Order of contradiction	Nature of contradiction/limitation
<p>Order 1: within an element of the activity system</p>	<p>Contradictions in Tools</p> <ul style="list-style-type: none"> • Mixing manure and soil is labour intensive, —“The system is not for lazy farmers” • Need for labour-reducing tools such as wheel barrows • Insects/pests are a problem in the system and are difficult to control using the tools available in the system. • Farmers do not have adequate access to seed. • Growing scarcity of kraal manure and wood ash. • Lack of equipment for irrigation such as hose pipes • Need for household tanks to harvest water. • Lack of documented proof to show that the system works effectively —“Now that is one constraint too with the MFS and with the other organisations: we don’t research. There is no research”.

- Time allocated for learning MFS among trainers is too short.
- Lack of documentation of the MFS.
- Most of the MFS publications are in Sesotho only making it difficult to spread the practise beyond the Sesotho speaking people. The ‘book’ that was said to be most comprehensive is written in Sesotho
- Inadequate funds to support the promotion (and practice) of MFS among the NGOs that are involved.
- Resource materials that focus on the narrow aspects of the MFS, just the techniques, the how of cropping only.
- Labour intensive, —Some other people complain that it involves a lot of work – manual. And that is in real because we are planting very many, many, many crops at different times”
- Time to prepare for training farmers, —Hewasn’t giving her time you know and when they were going to conduct training sometime tomorrow it was at thing time [after 14.00] that he would tell her after setting things, this and this and this that you should do things this way and this way and this way. And that really gave her a tough time”
- Inadequate alignment of philosophy, principles and key messages

Contradictions in Rules

- Climate, especially low rainfall which causes water scarcity

Contradictions in subjects

- Inadequate interaction and sharing of knowledge between trainers who understand MFS adequately and those who do not.
- What trainers learn in formal agricultural education is different from what they promote in the MFS
- Male farmers not wanting to be led/taught by a woman
- Since diploma and college graduates do are not taught MFS at all and only encounter it in the field when they work with NGOs and farmers promoting it, they have no knowledge of it

Object contradictions

- Finding money here and now to send children to school and spending time in the fields raising crops for future income and food.
- Short term versus long terms interests in terms of handouts and farming.

Community contradictions

- The Basotho do not eat a wide variety of vegetables
- Some NGOs are well-resourced and use their resources in a way that lures farmers away from the MFS (by for example, providing free seed, when MFS asks farmers to return seed plus 20 % more to keep the system going)
- Men from Lesotho went to work in South African mines leaving mostly women to do the farming
- Poor and lack of knowledge about MFS among policy makers, planners and extension workers in government
- University-farmers disconnect, no outreach or consultation

Division of labour contradictions

- Role of the Foundation in relation to other NGOs promoting MFS is not clear resulting in the Foundation doing what other NGOs feel it should

	not (doing extension work with farmers) while at the same time not doing what it should (such as research, documentation and quality control)
Order 2: between elements in the activity system	<ul style="list-style-type: none"> • Not enough young people being targeted for the MFS learning and practise, Subject-Community. • Some farmers pulled out of the MFS when the programme stopped providing inputs such as seed – Subject-object • Lack of a ready market for some of the produce, –“The people are not buying because they do not have any money even if they have produced” – Subject-object • Some people are too poor to practise MFS because they need food to eat here and now (and there is no relief package in MFS) – Tool-Community. • Collapse of farmer seed saving and networking system, which results in seed shortages, especially potatoes – Tool-Community • Some people in the communities, including farmers want food, irrespective of where it comes from and how it is produced. Many do not mind food aid, or chemical use – Community-object. • Having fewer youths in the community means that the object of sustainability is undermined – Community-object • Farmers considering output only not the costs involved when they judge MFS –“They are concerned with the output. If your yield is high, they don’t really look into the ratio of how much did I spend?” – Communities-object relations • Some farmers do not pay back the inputs and this disrupts the growth of the system – Community-rules. • Limited/lack of government support of MFS – Rules-Object. • Land tenure systems in which farmers rent land from land owners, —. . you would hire land today and tomorrow someone would like the land back. So it would be difficult. Once he sees that you are getting something out of the land, he will say aah, I am going to use my land now. So you will be forced to move to another land, so in that disturbs the craft” – Subject-rules • Inadequate understanding and inappropriate practising of MFS by farmers (e.g. proportion of kraal manure to ash) – Subject-Tools. • Promotion of MFS by trainers who are ill-prepared to do so (e.g. telling farmers to use a lot of ash in their fields when there is a drought, which burns their crops) – Subject-Tools. • Concentration on crop production to the exclusion of livestock production and off farming activities in the MFS against the concept of the system – Tool-Object. • Kikuyu grass which is seen as a difficult weed needing herbicides to get rid of (because the proposed tool would go against the ecological sustainability object) – Tool-object • People in authority (government) not supporting MFS, Community-tool • The problem with me is that when I was still at the college, we were taught by the British [interviewer laughs] and in fact, they were not in harmony with Ntate Machobane”, Subject-rules tension. • Recognition of MFS in government policy which is not supported by budgets and practical interventions on the ground —. .the battle faced by the MFS it’s similar to the adoption of conservation farming here because although the ministry it’s say conservation farming is a priority, that is not being translated into a budget. If you ask them, show me the

	<p>budget for conservation agriculture, you won't get it but if you say show me the budget where you subsidised tractors, you will get it. So it's the same thing for MFS. It is there in the policies, and priorities but it's not translated into concrete actions that we can see in the budget – Rules-tools</p> <ul style="list-style-type: none"> • Government seed certification system, which tends to not certify seed raised under the MFS (including its treatment and packaging) – Rules-tools • The growing season is too short for the organic manure to support the fast growth of crops that is necessary in short growing seasons —So if we have [chemical] fertilizer, we can also speed up the growth of the plants so that we can have a harvest — Rule-tool.
<p>Order 3: between the central activity and other systems</p>	<ul style="list-style-type: none"> • Limited supply of trainers from subject producing activity systems – Subject producing. • The government agricultural colleges and university curricula do not teach MFS as a matter of policy – Subject producing • The government sent 'wrong' and different messages about the MFS from that he was spreading thus creating ambivalence – Tool producing. • "Before I went to Bulgaria, there was a general impression given to us by the powers that be, yes, and the government – that the MFS was primitive. It was very primitive. This man was sending us back to where we came from" – Tool producing. • The system is not being supported by the government extension people (who cannot anyway because they do not know enough about it) – Tool producing. • Production and aggressive marketing of hybrid seed the seed companies and government —Even the seed input fairs that are running now, they would reject some of the OPV varieties and saying 'aah this one we don't know, this one we don't know. We do not support things we don't know.'" – Tool-producing. • Government agricultural researchers are too few to conduct trials with farmers covering the whole country – Tool-producing • Introduction of block farming and input trade fairs which promote conventional farming marginalises the MFS among farmers who could be interested because of easy borrowing – Tool producing • Private sector not willing to invest in the development and manufacture of farm implements that do not have effective demand in the country, — The hand ripper was successful, even this one was successful but there was no one manufacturing those equipments, locally. Like now we are saying, we are getting rippers from Zambia. Zambia is getting rippers from Zimbabwe [both laugh]. So they go from Zimbabwe to Zambia and Zambia to Lesotho. So we wanted to have our own artisan here to develop such tools. But when we approach these people they say, is there a market for these things?" – Tool producing • The government policy of modernising agriculture through more advanced western technologies using high external inputs contradicted with the MFS – Rule producing. • Government subsidy policy supports conventional farming not MFS – Rule producing. • The government also had a deliberate policy against MFS: "They were so much against it that we were not, even the teachers, were not allowed to talk about it at school. It was almost like a crime." – Rule producing.

	<ul style="list-style-type: none"> • Changing weather patterns, —You no longer know when frost will hit. So that is the problem... But this time it hits any time it likes. Like last week there was snow.” – Rule producing. • Funding problems because donors left the country around 2004 – Rule producing • IFAD as a believer in and sponsor of MFS through government, which is not present to monitor implementation of plans that it supports – Rule producing • Proximity to South Africa whose agriculture is highly mechanised tends to generate a negative attitude towards lowly mechanised agriculture —I think, Lesotho because close to South Africa, the agriculture here is mechanised. If you are still talking about draught power, the hand hoe, it is something that people think that you are taking them backwards” – Tool producing and Rule producing.
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4.5 EXPLORING FARMER LEARNING AND PRACTICES IN SUSTAINABLE AGRICULTURE: THE CASE OF THE MACHOBANE FARMING SYSTEM IN LESOTHO

1. INTRODUCTION

This is a report on a case study that I conducted **with** research participants in Lesotho. The case study is based on the Machobane Farming System, which is a sustainable agriculture practice that was developed in Lesotho half a century ago and has been learnt and practised by some farmers there over the years. It is based on interviews that I conducted with four development practitioners from two MFS-promoting organisations, and two groups of about 30 farmers from two districts of Mafeteng and Mohale’s Hoek. The interviews took place in the first week of October 2008. In addition to the interviews, I collected data from the two organisations and downloaded relevant literature from the internet, which also informs the report. The purpose of sharing this report is to seek validation by research participants in terms of the **emerging** findings and interpretations.

1.1 Research questions

The study aimed to explore how farmers are learning and practising a form of sustainable agricultural practice called Machobane Farming System (MFS). More specifically, it intended to address the following questions:

- Why are farmers incorporating sustainability in their agricultural practices?
- How do farmers learn about sustainable agriculture in their workplaces and homesteads?
- What are the main features of the Machobane Farming activity system in Lesotho?
- What are the current limitations and contradictions of sustainable agriculture in the learning processes and practices among farmers?
- What factors enable, constrain and underlie the learning and practising of the Machobane Farming System?

2. METHODOLOGY

I used a **case study** research design because the study sought to understand social phenomena within naturally occurring settings: farmers practising, learning and enhancing sustainable agriculture. I chose the Machobane Farming System as implemented by Rural Self-Help Development Association (RSDA) and the Machobane Agricultural Development Foundation (MADF) purposively as one of the relatively successful and well established examples of how sustainability is being learnt, and practised on one SADC member state, Lesotho. My other reason for choosing it is that it is well established in Lesotho, having been started about 45 years ago and yet it has not been significantly adopted outside Lesotho. Whereas other sustainable agriculture practices such as Permaculture, which are more recent, about half its age, and from further afield, are more widely practised in the region. The third reason was the fact that the system was developed locally by an ordinary farmer. The case study approach resonates with critical realism's intensive research.

I held **three** individual semi-structured interviews and **one** group interview with MFS promoters; and **two** group interviews with farmers practising MFS in two neighbouring districts. The combined number of farmer participants is 30. The interviews were based on the work of two organisations promoting MFS in Lesotho: Rural Self-help Development Association (RSDA) and Machobane Agricultural Development Foundation (MADF). In each organisation, the director, trainers and farmers were interviewed. The interviews were conducted over a week at the beginning of October 2008. Each interview lasted about 1 hour. I tape-recorded the data and subsequently transcribed it.

In addition to the interviews, I collected manuals, a book and some papers on MFS, which I analysed. I then wrote this paper, which I sent for member checking to the directors and trainers. I did not share it with the farmers because I did not write in their language. However, during the second phase of the research, in which we shall use **expansive learning** to address selected learning and practice issues, I will share the emerging issues with some of them. I coded the names in order to protect the anonymity of the research participants.

3. FINDINGS

3.1 The concept and emergence of the MFS

3.1.1 The broad and narrow concepts of MFS

There are various definitions and explanations of the MFS, some narrower than others and confining themselves to crop production, others broader and incorporating forestry, poultry, livestock and off-farm activities. I will adopt the broader definition because the founder of the system, wanted farmers to expand and even specialise (Machobane & Berold, 2003). Helvetas, an international NGO that worked with the system in Lesotho defines it MFS is a locally conceived, low cost, intensive, intercropping farming technology that integrates crops, forestry, and livestock rearing components. The technology centres on intensive year-round use of land through relay planting of different types of crops on one piece of land and use of natural (ash and manure) fertilizer. Trees are also incorporated in the system for their fruits, ameliorative abilities to soil, and wind breaking abilities. Livestock and poultry can be integrated into the system also as a complement" (Helvetas, n.d., p.4). Mosenene (2000) says that MFS has five components: cropping system; animal farming; off-farm income generation; a plan for mass education and the MFS philosophy. She also calls the system

Low External Input and Sustainable Agriculture. Animal farming is based on two traditional concepts of Basotho: *lesielo* and *mafisa*. *Lesielo* is the loaning out of a female animal in order to share the offspring and done using both small and large livestock but mostly with livestock that gives multiple and frequent births. *Mafisa* is looking after the livestock of another person in order to benefit from the by-products such as dung, draught power and milk. Big livestock is often used in this approach.

The narrow definition and explanation system systems to dominate literature written by people from outside Lesotho who see it as an intensive crop farming system that uses crop rotation, relay cropping and intercropping while at the same time enabling soil and water conservation, optimizing their use (Robertson, 1994; IIRR, 1998; Pretty, 1999).

3.1.2 The Machobane Philosophy

Mosenene (2003) says that MFS philosophy is built on three pillars:

Self-development: *“Develop a person and the person will develop will develop the land”*, which is very much a learning and knowledge development point. This pillar seems to refer to the self in relation to the self – **internalisation** of what society has to offer – development of mind, attitude and skills which as developed from local and traditional learning concepts as Grandin (2003, p. 3) notes below:

Based on local and traditional concepts of education its emphasis is on farmer field schools, solidarity (membership), collective action and self-reliance (innovation, adaptability and individualism), hard work (dedication) and making use of one’s own and other available resources (Grandin, 2001, p. 3).

Development and responsible utilisation of the resource base: *“Stick to thy hillock, oh man”*, meaning whatever piece of land one has, they must stick to it and make it productive, no matter what and this production can be achieved through cropping, animals and off-farm activities. This pillar covers the relationship between the farmers and his/her environment, ecological and economic. This constitutes one form of **externalisation** what has been learnt by acting on the environment towards an object.

Social relationships and responsibility to others: The third pillar is concerned with solidarity among farmers and social responsibility to each other. This dimension covers the relationship between the farmers and the others. This may be linked to the spirit of *ubuntu* among Bantu speaking people which basically means, *“I am because you are”* and is being used as a pillar for building the African Renaissance under the New Partnership for Economic Development (NEPAD) and the African Union (AU). This constitutes a **collectivist** orientation to learning.

3.1.3 MFS principles, objectives, key themes and messages

In addition to a philosophy, the MFS has spelt out principles, objectives and key themes and main messages (Table 3).

Table 3: Main features of the MFS

Feature of MFS	Components of the feature
MFS principles	<ul style="list-style-type: none"> • Use of organic fertilizers which are locally produced; • Ensuring perennial vegetation cover; • Having a cropping pattern that is adapted to the seasons of the year, which includes nitrogen fixing legumes, cash crops and food crops; • Natural pest control and preservation of natural pest eaters; and • Relay cropping that ensures continuous harvesting from the same piece of land during most of the year (Robertson, 1994; IIRR, 1998; Pretty, 1999).
Objectives	<ul style="list-style-type: none"> • To eradicate hunger or to ensure households food security; • To attain and maintain good health; • To achieve economic security; and • To cultivate and maintain self-actualisation and reliance – confidence to achieve (Mosenene, 2000; Grandin, 2001)
Key areas	<ul style="list-style-type: none"> • General food security; • Income generation; • General household well-being; • Community spirit, empowerment; and • Social-economic-environmental responsibility (Grandin, 2001)
Main messages	<ul style="list-style-type: none"> • <i>Self-reliance</i>: farmers should achieve food security without external assistance; • <i>Appreciation of the resource base</i>: improve the crop production by optimal utilization of resources; • <i>Learning and teaching by doing</i>: farmers must be trained on their own fields and farmer trainers must be able to do work along them; and • <i>Spontaneous technology spreading</i>: farmers learn from fellow farmers, and have duty to help their neighbours to learn (Pretty, 1999).

3.1.4 MFS planting model

The system has five planting and harvesting models, from two sowings and one harvest to four sowings and four harvests (Fig. 2) and one late planting model in which all plants are planted on the same day rather than staggered as is usually the case (Mosenene, 2000).

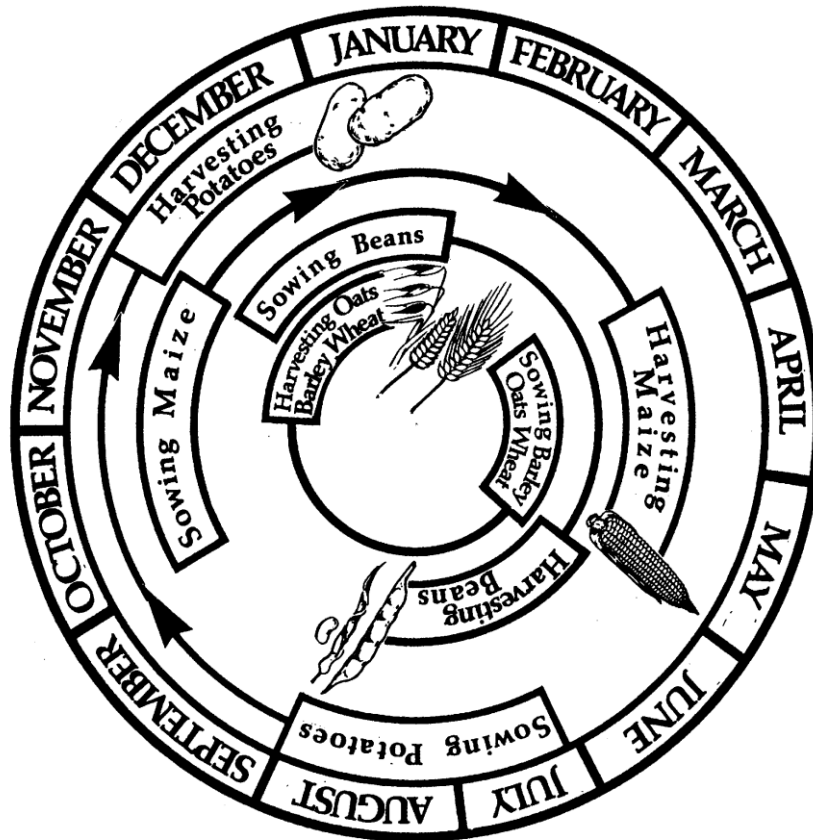


Figure 2: Planting and sowing time in the MFS, an example of the four sowings and four harvest model

3.2 Rationale for the emergence of MFS

The MFS was developed by James Jacob Machobane, son of farmers – sharecroppers who left South Africa when sharecropping with blacks was prohibited (Machobane & Berold, 2003). Referring to the influence of his parents on him, Machobane said, *“They farmed throughout their lives. And so did I”* (Pfothenauer, 1987, p. 3). Machobane was a farmer and writer, who first experimented on his farm for 13 years before sharing it with fellow farmers. Machobane developed the system because he was an innovator who sought solutions to address practical problem as noted by Linda Pfothenauer:

His penchant for developing his own concepts and principles and putting them into practice can be traced right back to his early years. As a prefect at Morija Training Centre, he once convinced school authorities to institute an entirely different disciplinary system, one based on dialogue, guidance and persuasion (Pfothenauer, 1987, p. 3)

3.2.1 Soil erosion and land degradation

The MFS was developed in response to soil erosion and land degradation in Lesotho. Apart from the soil erosion, during the Second World War Machobane was working on his father’s farm at which he was forced to notice other factors undermining crop production, the risks inherent in practising agriculture in Lesotho and Robertson (1994, p. 102) notes:

Each year one of these things is an affliction to the crop in Lesotho; no matter what, if you do not experience drought, then you experience too much rain; if that is not the case, you experience early frost; if that is not the case, you experience hailstorms ... Today, it is even worse because it is mechanized – the whole thing flops (Robertson, 1994, p. 102).

3.2.2 Abject poverty

Machobane developed the MFS because of his close encounter with abject poverty when he was a student at Morija Training College – women brewing and selling beer to make ends meet and ending up being arrested because it was both illegal and unchristian (Mosenene, p. 3). This suggests that there was high unemployment of women in the country. He wanted to drive out hunger from the country:

James Jacob Machobane, born 1914, has led a completely unorthodox life, a pioneering life sprung from instinctive self-knowledge, self-evolved principles, self-tried theories and a passionate concern for his countrymen and indeed mankind in general ... At the core of all this has been a lifelong obsession – hunger – and how to rid his people of this scourge (Pfothenhauer, 1987, p. 2).

Leboela and Turner (2003), note that the word ‘hunger’ is a Sesotho idiom for poverty and hardship. So the motto of his college, ‘Drive out Hunger’ should be understood in this context.

3.2.3 Affordable farming system

The MFS was designed to suit both the target people, their social conditions. Machobane wanted a system that would work for the lowest man (Machobane & Berold, 2003). And in developing the system he carried about some research about how the Basotho used to live and how they used to raise crops. That is where he got the idea of intercropping. Machobane encouraged the growing of potatoes after observing that they were growing well in old fields that were no longer being cultivated. In developing his system, he noticed that a woman would have difficulty to use a plough drawn by two oxen he tried a horse and made the same conclusion. He was satisfied with a donkey (Machobane & Berold, 2003). Incidentally every widow – referring also to women whose husbands were away in South African mines – had a donkey. In 1994, two-thirds of households had such ‘widows’ (Mosenene, 1999).

3.2.4 Suitability to agro-ecological conditions

The MFS was developed to suit the climatic conditions of the country. A manual developed by RSDA sums this rationale adequately when it says, *–The Machobane Farming System answers the question of cool winter because it includes planting peas, wheat and potatoes... In summer Lesotho sometimes experiences drought and since the plan involves the planting of sorghum (intercropped with maize, beans and pumpkins, which are not drought resistant)... the system is a climate risk aversion strategy which minimises the chances of total crop failure”* (RSDA, n.d.).

3.2.5 Risk mitigation

The MFS was informed by a desire to manage and spread risks and to provide insurance against total crop failure. He says, *“When I saw the damage the storm had caused, I told myself that I had to change my pattern of cropping ... Then I realised that if one crop gets damaged, the other one should be coming up... The beans had to be planted on the same line*

as maize or sorghum for protection... The same with the other destructive element, birds. When the sorghum is alone, the birds enjoy it freely... I saw that if sorghum is side by side with maize it would be protected. This is how I introduced intercropping” (Machobane & Berold, 2003, p. 56-57). Machobane saw intercropping as a form of insurance against the vagaries of weather. His following statement is instructive, *“One crop can never work because you need the insurance of different crops coming up. I explained that a country like Lesotho has a varying kind of climate where you are hit by drought you are hit by frost and hailstorms. You might insure all these crops financially but insurance does not mean production. The whole thing must insure itself”* (Machobane & Berold, 2003, p. 63). The MFS is therefore rooted in the idea of building **resilience**³ of communities and of food systems in those communities.

3.2.6 Building farmer agency⁴

MFS was inspired by the desire to build and enhance farmer agency. Machobane was concerned about the fatalistic attitude of the Basotho who would pray to God and do nothing to help themselves (Lewis, 1959). This attitude, essentially lack of agency, *“prolonged the dependence which led to abject poverty and hunger of the day, the starvation of no less than true slavery... there is need to hasten the ending of human apathy and indignity ... saving victims from perpetual foreign charitable aids”* (Machobane, 1981, in Mosenene, 2000, p.).

3.2.7 Addressing the weaknesses of convention agriculture

MFS was a response to the inadequacies of the conventional agriculture to meet the needs of the farmers. Machobane developed the systems because the farmers who were supported by government extension services were living from hand to mouth because of the cropping system which was under-utilising the land. The farmers mostly grew maize and secondary crops such as sorghum, wheat, peas and pumpkins. Potatoes were only grown in gardens. Some of the reasons for which Machobane rejected conventional agricultural practices were:

- The land was terribly under-utilised;
- There was no effort to make full use of the growing season;
- There was always high risk of failure should the season be difficult due to drought, too much rain, early or late frost, pest and disease attacks etc; and
- Crop rotation was not practised as often as it should be (Mosenene, 2000; Grandin, 2001; RSDA, n.d.).

3.3 Historicising the MFS

The history of MFS is long and loaded. For 40 years it encountered serious obstacles, first from the colonial government who treated the innovator as a charlatan who could mobilise masses against it. After independence, politicians treated him with suspicion and technical officers questioned the scientific basis of his work. However, many farmers rated this system superior to the *“regular cropping system”* (Mosenene, 2000, p. 3). After developing the

³ Resilience can be seen as the amount of change that a system can undergo while maintaining its function and structure; or the degree of self-organising capacity; or the capacity for learning and adaptation.

⁴ Agency refers to the power and capacity to do something such as the power to choose and ability to pursue such choice.

system, he opened the Machobane Agricultural Mass College and Cooperative Union in 1957, in Lesotho, providing residential courses to 12 tutors who each in turn had to supervise the learning of 20 others (Pfothenauer, 1987; Robertson, 1994; Mosenene, 2000). In addition to agriculture, the college also offered courses in building, typing and management. This seems to be in keeping with his idea of off-farm activities. The college was closed in 1965 in a government raid and went into hiding up to 1969, after which he began to openly promote the system in the Maseru area between 1970 and 1980. In 1977, Machobane began to write on the MFS. The government decided to honour his innovativeness in 1990 when he was awarded a doctorate. NGOs such as RSDA and programmes such as SWACAP, an affiliate of IFAD began promoting the MFS in the 1990s in various districts of the country. By 2003, there were 2,000 farmers trained in and practising MFS in Lesotho (Machobane & Berold, 2003) and the number seems to have not changed much since then.

As part of discussing the emergence of MFS, it is important to identify some of the key events and to show how they affected the learning and practise of the system. The table (Table 4) seeks to summarise the key moments and their effects.

Table 4: History and development of MFS

Period	Important event or activity (Machobane & Berold, 2003)	Implications on the activity system ⁵
1944-1956	Machobane conducts his 13 years of research on MFS at Nqechane	Emergence of MFS as an innovative locally adapted farming practice in Lesotho. This would constitute modelling in the Expansive Learning Cycle ⁶ .
1948-1949	Machobane is employed as sub-editor at Morija Book Depot	While there Machobane witness abject poverty, women being arrested for brewing and selling beer, something unchristian and illegal. This strengthens his resolve to look for an effective way to end hunger and the indignity that it brought with it. This would inform the analysis in terms of the empirical evidence of poverty and hunger, which needed to be addressed.
1957-1959	The Machobane Farming System gets taught to farmers for the first time and 200 farmers produced bumper harvests of potatoes and	Farmers learn by doing and this takes place over 5 years before they can qualify. This stage can be seen as the implementation phase of the expansive learning cycle.

⁵ An activity system is the minimal meaningful context for understanding individual action and consists of a group pursuing a specific goal in a purposeful way. It has six main elements: Subject, object, tools, rules, community and division of labour. Subject is the individual or group of people whose agency is chosen as a point of view in the analysis of the activity system. Object is the raw material or problem space being worked on, a horizon never fully reached. Tools are Conceptual and material artefacts for understanding or transforming the object and carry culture, history, skill and knowledge involved in developing them. Community is the group of people who share the same object. Division of labour allocates the horizontal and vertical relationships of the people who share the same object. Rules, which could be natural or social, mediate the relationship between the subject and the object and the subject and the community.

⁶ An expansive learning is concerned with iterative knowledge construction and application. The expansive learning cycle begins with a contradiction, which is then analysed empirically and historically. Then the following steps are followed: modelling new solution; implementing model; examining model; implementing revised model; reflection on the processes; and consolidating the new practice in the context of the entire activity system.

	repay their loans (1958-9).	
1959-1960	The Department of Agriculture compares MFS and conventional farming and results shows MFS produces double	This can be seen as a period of reflection or reviewing of the newly developed model.
1960	Machobane gets international recognition and is funded by Ford Foundation to travel to North America, Europe and Africa	This was further confirmation of the quality of the innovation.
1961	Machobane is awarded the Lane Bryant International Volunteer Award. In his reception speech he says that if the people are hungry, they will support communism which was understood to mean he supported it.	The innovation gets caught up in the Cold War politics and the fall of Machobane and his system begins. His speech activated forces that had hitherto been inactive in his political and social space.
1965	The Machobane Agricultural College is forced to close by government.	This disrupted the spread of the innovation and the chances of remodelling it. The actual event was also evidence of the effect of forces that were activated.
1965-1969	Machobane hides from government	The disruption of the learning and practice of MFS persists as the farmers and the innovator could not do joint reflection , analysis and problem solving.
1969	Machobane travel to Germany and obtains funds to revive the college but the government blocks the funding	This suggests a new kind of solution in the new system to respond to the needs for training resources. He had modelled another solution but 'rule' prevented the solution 'tool' from being realised.
1970-1980	Machobane lives in semi-hiding but continues to teach MFS in Lesotho	The contradiction between the government and the subject keeps the focus of the activity on implementing the model, not developing it further.
1977	Compilation of a book on MFS	This suggests another path of expansive learning, developing a tool so that the system could also be taught by others. It can be seen as modelling too.
1990	Awarded doctorate in honour of the MFS by the National University of Lesotho	The recognition served to signal the removal of a structural barrier, from a rule-producing activity system. There is a degree of interpenetration that results in partial structural change, marking the beginning of morphogenesis ⁷ or transformation.
1991	MFS revived by IFAD through SWACAP	Funds and human resources were added into the activity system, which served as important tools that enabled, not the immediate transformation of the system but its transportation to other farmers. During this period some learning materials were produced, thus developing other new models .
Early 1990s	Organisations such as RSDA and Helvetas promote MFS	This also improved the activity system by providing another mechanism through which the MFS could be promoted. RSDA on its part introduced the hand push ripper and the ox ripper as well as strip farming, thus improving the activity system. The introduction of the ox ripper can be seen as the remodelling of the hand

⁷ Morphogenesis refers to the complex interchanges that produce change in the system's given form, structure or state.

		push ripper – a further refinement of a solution to address labour intensiveness. Helvetas provided essential resources some of which were used for documentation of the MFS.
1993	The MADF was established with a specific mandate to promote MFS	The addition of this mechanism, another form is tool, strengthened the activity system but at a different level. Since its inception, the MFS has also produced learning materials, included horticultural crops and begun research on compost and organic manure to replace kraal manure which is getting scarce – thus modelling and implementing new models. The employment of formally educated agriculturalists created the potential for changing the „ primitive and backward “ stigma attached to MFS.
2003	The government acknowledges that MFS has an important role to play in the agriculture of Lesotho	The rule-producing activity system removes a third order contradiction, that between government policy and the MFS.

Table 4 suggests that there were cycles of planning, action, reflect, learn, which is typical of action learning. The system could have been strengthened by employing expansive learning which seeks to ensure that a newly developed solution follows more rigorous testing before final adoption by double action, double reflection and double modelling in one cycle.

3.4 Why are farmers learning and practising MFS?

The study revealed that farmers were motivated to learn and practice MFS for different reasons. However, all people interviewed were attracted to it because it is ‘cheap’ and ‘affordable’ since it uses locally available resources such as kraal manure and ash. They all valued its high level of productivity compared to the other systems of agriculture they knew. These reasons were primarily economic. This was captured by a neighbouring farmer during a group interview:

Interpreter: She is saying that well, she doesn't really know much about Machobane, they are buying some potatoes from this garden here and they are just surprised ...they were never told.

Researcher: They were never told. Did you ever ask?

Interpreter: She says she never asked them how they do it but she thinks MFS must be a special way. You see. That's why she thinks at least they should have trained her.

The other motives were ecological, the main one being to conserve water through soil improvement. Some farmers were attracted by MFS' strengths on building the soil because they wanted to leave better land for their grandchildren. One group of farmers reported that organic produce is tasty and cabbage produced from the system cooks well.

MFS encourages self-reliance and collective work, joint action to solve problems (matsema), thus promoting the spirit of togetherness. However, some farmers joined because they benefited from seeds and when the facility was not longer there, they left their MFS group. A retired agricultural extension officer learnt about the MFS because he wanted to take

something to farmers in his home area. He had a desire to do something that would be useful in his home area – increasing his worth. His second reason was to infuse his knowledge on horticulture into the system and therefore help grow it too, *“We started now with vegetable crops. So I was the man now introducing that and that is why now I become very much interested, to produce vegetables organically, it is that important.”* The desire to contribute something to MFS also inspired a scientist to learn MFS.

MFS is an innovation of Lesotho and learning and practising it gives the Basotho a sense of pride and identity as one interviewee commented:

But each country I visited, I met with the local people and all of them were very proud about what they had achieved as a nation, as a people and almost all of them, all the countries said something. The French said they had the best country in the world... The Bulgarians told me that they had the best bacteria ... that one that changes milk into sour milk... They have it because of their climate... And when I went to Greece they talked about being the cradle of civilisation. And all this inspired me to try and find out, *‘What can we be proud of as Basotho?’* So the first thing when I came back, I looked for Ntate Tamane as an historian and he directed me straight to Dr Machobane.

3.5 How do farmers learn the MFS in their workplaces and homes?

3.5.1 Farmer MFS learn primarily through scaffolding

Scaffolding refers to learning that is done through the help of a more knowledgeable other (MKO). In MFS the MKO other can be a trainer or a fellow farmer. The later also takes place through **farmer to farmer extension** and farmer field schools. In the language of MFS, the farmers who are trainers of fellow farmers are called **tutors**. These ideally receive more concentrated training before then can being performing this task. The first 12 tutors who were trained by Machobane spent five years learning before they graduated as tutors. Such tutors also use their productive fields to inspire other farmers as well as, as examples to be copied by other farmers to get interested in the system. Even now, farmers become tutors after practising the system for at least five years (RSDA, n.d.). This MFS approach to training profited from circumcision schools where a graduate automatically qualifies to teach others. Between 1991 and 2001, SWACAP and then MADF had trained and registered 562 farmers (Mohapelo, 2002). But altogether there were 2,000 such farmers‘ most of them trained by RSDA.

3.5.2 Farmers also learn through experimentation and innovation

During their agricultural activities as part of building self-reliance, farmers are encouraged to observe, and solve problems, to *‘learn from the soil’*. This is what Machobane was referring to when he said, *“When the old become redundant, lose their productivity, it is the invention of new things that hope of a new life is born,”* Machobane, the innovator (MADF, n.d.). Farmers, together with development facilitators such as extension workers working with the MFS have made some improvements to it to address some of the problems that they encountered in implementing MFS. They are also looking at ways of addressing some of their current limitations. The innovations that farmers initiated were concerned with reducing labour. At institutional level, RSDA identified and supported the development of a hand push ripper to reduce the labour to dig holes. The ripper was then designed and developed in South Africa. Through interaction with other agricultural organisations such as GART in Zambia, RSDA was able to facilitate the importation and use of ox driven rippers from Zambia.

Farmers made two main labour-saving innovations, replacing the digging of holes for planting seed, with use of a mono-plough to make furrows, and another concerned with not having to bend down to measure distance between plants during planting. The following quotations articulate the points:

When you plant potatoes also you have to dig the holes with a spade, you are supposed to do that as recommended in the system but we saw that it is difficult and it takes time. Then we use strings to mark the lines and then we use the mono-plough to open up furrows so that we can put potatoes and cover the soil. Instead of digging the holes we just open up the furrows using animals.

When we were taught how to plant, we were taught that the space between the potatoes, you have to measure it, and then to measure it you have to bend down. And then we felt that we cannot manage anymore because of backache and then we just size with some hoes so as to make it easy and simpler, so that we can't [don't] bend down every time we planted, especially the sowing of potatoes.

When farmers complained about the difficulty of harvesting different crops planted in the same hole, they, together with RSDA replaced that system with that of strip cropping, where intercropping was achieved by using strips. This also made it easier to rotate. When the MFS was developed, it was not strong on the horticulture. This dimension has been added and farmers grow a vegetables and root crops such as carrots and beetroot, which they traditionally did not grow in the system. This addition has been accompanied by the development of a system of rotating the vegetables and a manual to support. MFS has also been extended to a new group of people: pupils. The Foundation initiated an MFS programme with schools, where pupils are taught MFS and practise it in the schools. The idea behind this initiative is to give children and opportunity to grow up aware of and exposed to agriculture. Finally, whereas historically the MFS has been practised in fields and not in gardens or around homesteads in back yards, it has recently encouraged farmers to take it to these spaces, meaning that it now has potential for uptake in urban agriculture.

Meanwhile there are two important innovations being developed in the system. The Foundation is researching on other forms of organic manure to replace the declining availability of kraal manure and wood ash. RSDA is looking at ways of ensuring the continued promotion and practise of the MFS by establishing demonstration plots of MFS at District Agriculture Offices so that government takes it up too, especially given the fickle nature of funding for NGOs that are currently promoting the system. The demonstration is also meant to help farmers assess the potential of MFS in their respective areas. While these innovations are being developed, there seems to be a lack of learning that links the everyday knowledge to scientific knowledge, which is the third form of learning in CHAT. This can be attributed to limited research and documentation and to the attitude that the results speak for themselves.

3.5.3 Farmers learn mostly through practical activities

Machobane insisted that anyone who studies at the college should be prepared to stay at the college and work practically, to practically take part in production (Machobane & Berold, 2003, p. 51). Farmers learn the MFS **by doing or through practice**, that is, on the job training. For example, they learn through **demonstrations** in two senses. In one sense the tutors show them how to perform certain tasks – demonstrations where trainers show farmers

how to do the different aspects of MFS before they implement, usually at the beginning of a planting season (RSDA, n.d.). In the other sense, demonstration involves setting examples to show what an MFS looks like, a working example, a ‘lighthouse’. For examples RSDA uses *excursions, or look and learn visits* where new farmers visit practising farmers to see how they are practising it.

3.5.4 Credibility of tutors and trainers enhance farmers’ attitude to learning and practice

Campaign and orientation meetings are also used for the teaching and learning of MFS. These act as the foundation of the subsequent training because they seek to answer the question of why farmers should adopt the MFS. The farmers are told about the history and rationale of the system. When he was still alive (he passed away in early 2008), the founder would normally perform the campaigns at the request of other organisations because he was very good at it. Farmers also had a certain amount of respect for him. It was not just the facts that he presented that mattered but also the credibility that he carried as a successful practitioner of the system for half a century.

3.5.5 Use of vernacular language enhances farmer learning

One of the most important tools used in the dissemination of information about the MFS are *radio programmes*. The programmes are conducted in the vernacular language and are therefore accessible. Farmers interviewed indicated that they found the programmes useful. Some of the programmes allow farmers to share ideas on farming. In addition, the programmes have been found to be useful to convince other farmers and even policy makers that the system is good and effective. Most of the materials that have been developed on MFS have been first developed in Sesotho and many of them are only found in that language, which is good for local farmers. Meetings and workshops on MFS in which farmers take part are generally conducted in Sesotho, removing language barrier.

3.6 The MFS activity system

In CHAT, people learn through activities in activity systems. In order to understand the learning processes, it is important to define who and what occupies the various elements of the system. In looking that the MFS and adopting the perspectives of MFS farmers and promoters, the study produced the activity system below (Figure). The figure also provides an important background for understanding and analysis the contradictions that arise from the activity system as well as between the activity system and other activity systems.

Mediating artefacts: Demonstrations; MFS theory; meetings; workshops; planting calendar; indigenous knowledge; manuals, radios, farmer programmes on radio, funds, language; farmer to farmer training; orientation meetings; seasonal training; farmer assessment and accreditation; *matsema*; *lesielo*; *mafisa* leadership training; bookkeeping; farmer-saved seed; dry planting; natural pest control; kraal manure, wood ash and compost; intercropping; relay cropping; farmer group constitution; water harvesting tanks; weirs; locally adapted livestock

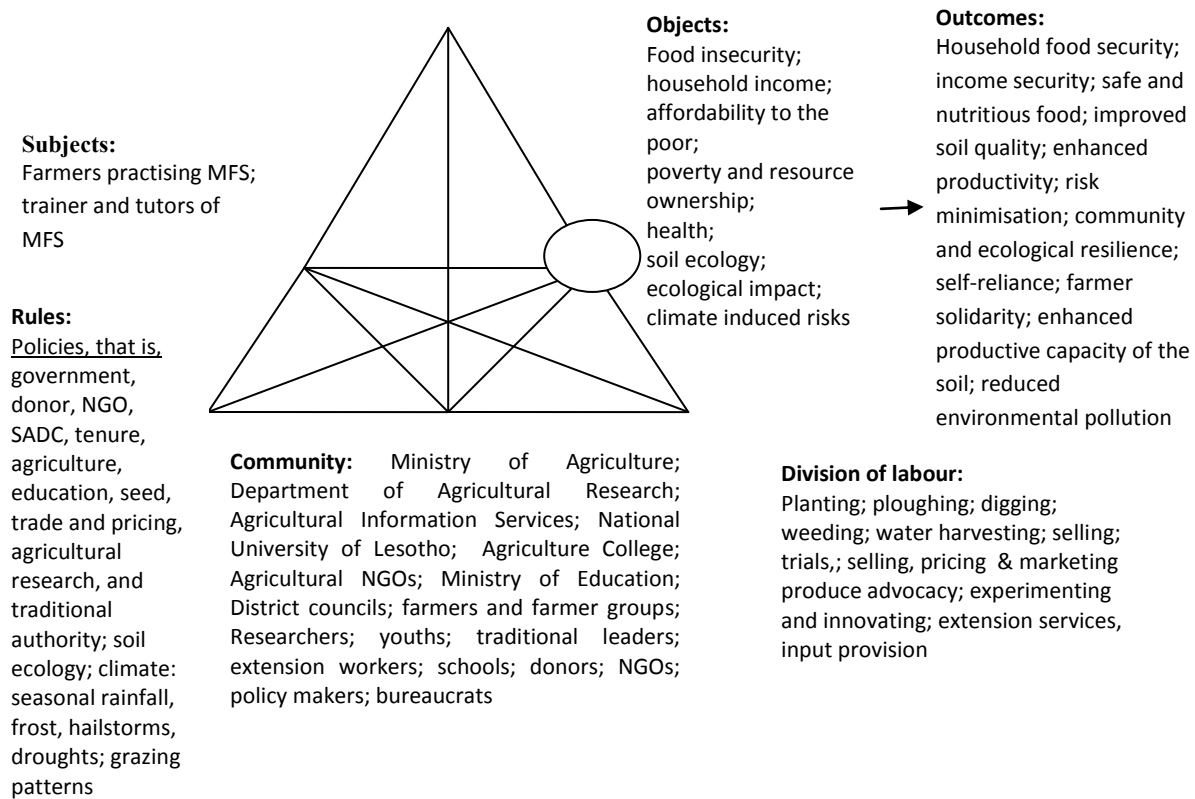


Figure 2: MFS activity system

3.7 What are the contradictions in the Machobane farming activity system?

3.7.1 The MFS is labour intensive and time-consuming

Of course not every farmer wants to put in the work. You have to work for at least two hours every day; the whole year round. I find that the middle aged farmers respond best. The old people are often not strong enough. The young people criticise the system, saying nowadays we want to move fast, we need machinery, Motsoane, MFS trainer from the MADF quoted in Machobane and Berold (2003, p. 89-90).

One of the most important issues that the MFS needs to address is the development and supply of tools and equipment to lighten work as well as to enable farmers to do the work faster. In some cases the tools are available such as wheel barrows and hose pipes but the farmers cannot afford them. But one of the main challenges is that for more specific tools such as the ox ripper, there is not enough demand for the tools in Lesotho to warrant the setting up of a manufacturing plant so they end up importing it from Zambia, which in turn imports from Zimbabwe. This means that the ripper becomes more expensive and therefore less accessible to farmers. One group of farmers indicated that the mixing manure and soil **takes time**. Other farmers have to carry water from far to irrigate gardens and would also like

to have water tanks installed. Another factor that makes the MFS appear even more labour intensive is that it takes place throughout the year, as one respondent, a trainer noted, *“Some other people complain that it involves a lot of work – manual. And that is in real because we are planting very many, many, many crops at different times.”* One group also noted that planting potatoes in the way that is recommended, using spade to dig holes is both *“difficult”* and *“takes time”*. Studies elsewhere (Pantalani, 1996) suggests that MFS is more **labour intensive** than even traditional agriculture and *“low input”* improved technologies, except in the case of potato production.

3.7.2 Inadequate research and documentation of the MFS

—With the Machobane approach, the system is a true-to-heart system. The people see for themselves, they do things practically, not reading from books” (Machobane & Berold, 2003, p. 94).

Literature review and the interviews that were conducted during the research suggest that one of the main limitations in the learning and practising of the MFS is limited documentation of the system to demonstrate that it works effectively (Mohapeloa, 2002). The limited documentation is linked to a lack of research on how and why the system works well. One promoter during the interviews noted, *“Now that is one constraint too with the MFS and with the other organisations: we don’t research. There is no research”*. What has further constrained the spread of the practice beyond Lesotho is the fact that some of the key manuals are only found in the local language, Sesotho.

Researcher: I will get both. Which are the other publications that you have?

Respondent: The other publications that we have are in Sesotho.

Researcher: So these are the two that you have in English?

Respondent: Yes these are the two that we have in English. Now this one we are talking of translating it into English. Here is the real MFS.

3.7.3 Incoherencies in the MFS

In addition, the body of literature on the MFS has **incoherencies** in it that need to be addressed. Worth noting is the progressive loss of something as we move from philosophy to objectives (Table 3). The principles of MFS only elaborate on one of the three pillars of the MFS that is the farmers’ relationship with the natural resource base. The principles, objectives and messages seem to be drawn only from the narrow definition of the MFS, the first stage of the process. As we move from principles to objectives, the ecological dimension is lost and yet three of the five principles are solely about the ecology of the land. The key areas leave out the individual dimension of learning and innovation, which is an important component of the MFS. Also missing in all the four features in the table, and discussed elsewhere, is something to do with progressive development of the system – that farmers start with general crop production before they can specialise as well as move into animal production and off-farm activities – in a sense diversifying their livelihood base.

3.7.4 Double stigmatisation⁸ of MFS

There is a growing and general disinterest in agriculture in Lesotho. This attitude is worse when it comes to MFS. Mosenene (2003, p. 4) quotes Machobane as having said, *“The introduction of western education to this country taught children that farming was something dirty and primitive”*. This disinterest may be part of the reason why the per capita agricultural production in the country has fallen to a third in two decades from 180 kg in 1974 to 60 kg in 1994 (Mosenene, 2000). The **second layer of stigmatisation** of agriculture takes place in the MFS, first because it is an agricultural practice and second because it is perceived as backwards, as one promoter noted, *“I think, Lesotho, because is close to South Africa, the agriculture here is mechanised. If you are still talking about draught power, the hand hoe, it is something that people think that you are taking them backwards”*. This perception goes a long way back and was embedded in the people during the 1960s by the colonial government as a way of discouraging it as another interviewee noted, *“Before I went to Bulgaria, there was a general impression given to us by the powers that be, yes, the government – that the MFS was primitive. It was very primitive. „This man was sending us back to where we came from””*.

3.7.5 Inadequate availability of inputs, learning materials and funds

Ash and manure are becoming scarce: manure because of cattle disease that killed many cattle, and ash because of the falling availability of trees for fuel energy. These two tools are fundamental in the improvement of the soil, the foundation for increased production and productivity. The other input which runs short are seeds for farmers, especially potato seed. The fall in seed availability has been caused by the collapse of farmer seed saving and networking system, especially potatoes. The government system of accrediting seed producers has tended to favour corporations which have the necessary funds for treatment, branding and packaging. The learning materials available, especially those in English, tend to carry only certain aspects of the MFS, thus fragmenting the concept, isolating crop production from the rest. Finally the NGOs that promote the system generally do not have the needed funds for supporting the learning and practise of the MFS: for workshops, excursions, monitoring and materials development.

3.7.6 Competing approaches to agriculture and MFS

The agency of agricultural promoters in the country contradicts at three levels. There is there level where some extension workers promote conventional agriculture and others sustainable agriculture within which the MFS falls. Then among those who promote MFS there is are **ambivalent messages** concerning the use of fertilizers and chemical pesticides. This confuses the farmers. Part of the reason for ambivalent messages within MFS is that the promoters are trained for a mere three days before being allowed to work with farmers. As a result, they have an inadequate understanding of the system. For example, one MFS consultant discovered that farmers had been advised to pour a lot of ash in their fields during a drought year. Consequently the crop was *‘bunt’*. At a third level, some of the international NGOs

⁸ Double stigmatisation is a word coined by the researcher in this study to refer to the two of rejection that sustainable agriculture faces. The first layer is about people not wanting to pursue agricultural studies and practices in general; and the second is concerned with even fewer people wanting to do sustainable agriculture because some of its aspects are seen as primitive or backward compared to conventional agriculture.

which are well resourced promote the system but in a way that creates dependence by providing free inputs (such as seed), while the local and less resources NGOs ask farmers to repay the seed plus a 10-20 % to keep the system growing. A related concern is the division of labour between the Machobane Agricultural Development Foundation and sustainable agriculture NGOs in Lesotho. Grandin (2001) went as far as saying there is no clear and common vision on the MFS among those promoting it. This weak **relational agency**⁹ in the MFS is worsened by limited interaction between the trainers who are experienced and knowledgeable and the newcomers.

3.7.7 Lack of meaningful support from government and agricultural research centres

The battle faced by the MFS it's similar to the adoption of conservation farming here because although the Ministry it's saying conservation farming is a priority, that is not being translated into a budget. If you ask them, show me the budget for conservation agriculture, you won't get it but if you say show me the budget where you subsidised tractors, you will get it. So it's the same thing for MFS. It is there in the policies, and priorities but it's not translated into concrete actions that we can see in the budget – Words of an interviewee in the study.

Both historical and current information suggests that the government and the university have not invested in the development of MFS. In many cases, especially before 1990, the government undermined MFS. This lack of support is largely evidenced by the absence of government MFS programmes on the ground even though the practice has been incorporated in government agricultural policy. No budgets have been set aside for the promotion of the system. Two important reasons advanced during the research where that policy makers, planners and extension workers in government are ignorant about the system and therefore cannot support it. The other reason is that the government policy is generally oriented toward modernisation of agriculture, which means high external input. This orientation, in part has been attributed to the fact that the government gets a good part of its budget from western governments who themselves favour conventional agriculture. Grandin (2003, p. 14) concludes MFS has not been adopted widely in Lesotho “... *in part due to government resistance to formally adopt MFS as it does not fit with industrial agriculture models and the associated financial aid packages offered by the developed world*”. Consequently all government agricultural programmes such as **block farming**¹⁰ and **input trade fairs** support the purchase of such items as tractors and chemical fertilizers. Grandin (2003, p. 14) further notes, “*There is a general and prevailing scepticism to MFS within the MoA [Ministry of Agriculture]. This stands out as the single biggest hindrance to mainstreaming the technology. This scepticism effects opinion and support not only within Lesotho but abroad too.*”

⁹ Relational agency is concerned with how subjects in an activity system and with different expertise and capital responsibly and reciprocally work together to jointly interpret their object and take joint action to transform it.

¹⁰ Block farming refers to the grouping together of small tracks of land or fields that belong to different farmers so that they form 'larger, economically viable and productive blocks' under the management of one person.

One trainer noted during the study, *“Even seed the input fairs that are running now they would reject some of the OPV varieties and saying „aah this one we don’t know, this one we don’t know. We do not support things we don’t know.”*” The effect of lack of government support has been exacerbated since 2004 when many donors left Lesotho and reduced their funding to NGOs. The government agricultural colleges and university do not teach MFS, meaning that there is no regular supply of extension workers to support farmers. One interviewee noted that there is a farmer-university disconnect because the university does not have an outreach programme in which it can engage with farmers and respond to their needs and interests. More specifically, there are no university studies seeking to understand and improve the MFS.

The land tenure system discourages investment in building the soil, an important pillar of the MFS because many farmers lease land from landlords for short periods of time and some have had it taken back when the soils improved. One MFS trainer commented, *“... you would hire land today and tomorrow someone would like the land back. So it would be difficult. Once he sees that you are getting something out of the land, he will say aah, I am going to use my land now. So you will be forced to move to another land, so in that disturbs the craft”*.

3.7.8 Inadequate time to learn and build the practice

Trainers of the MFS are allocated a mere three days to learn the MFS. This is not enough for them to master the practice and then support the learning of farmers over five years. One of the trainers who worked with Machobane in training also pointed out that she did not have enough time to prepare ahead of training workshops. Farmers also indicated that it takes time to build the soil and make it productive. Also important in the broader concept of the practice is for the farmer to reach the stage of specialisation and decide on what to specialise on. So far there are very few cases of specialisation among the MFS 2,000 farming households. Other farmers complained that the growing season was becoming shorter and that the organic manure was no longer providing adequate nutrients to speed up the growth to happen during the rainy season. This may also be a factor concerned with the varieties that they planted – whether they were early or late maturing varieties. The manual techniques employed in MFS, though inexpensive take longer to complete tasks such as planting potato seed.

3.7.9 Clashes between the short and long term, the economic and ecological needs

Within the MFS there are a number of farmer needs that clash. Some poor farmers need to find money here and now to pay for school fees for children and meet other household needs while at the same time they need to spend time in the fields planting crops that will be harvest three or so months later. Some agricultural NGOs have also been torn between providing food aid and or investing in agricultural knowledge that will bring food security in the long term. This, in a sense, shows the ambivalent effect of poverty of the MFS: on one hand it is so affordable that any farmers can do it while on the other, such farmers sometimes have to put the food on the table here and now. Some farmers, who decided to pull out of an MFS programme when seed inputs were stopped, suggesting that what motivated them to join was the ability to access seed. Some members of the community, including farmers in MFS seem to want food irrespective of how they produce it, or how it gets to them (e.g. as food aid) thus raising questions about their commitment to or understanding of sustainability. A farmer in one of the two farmer groups interviewed suggested that they would like assistance in the

form of herbicides so that they could kill Kikuyu grass which is a weed difficult to work. Similarly, farmers there are some farmers who prefer conventional farming for its ‘higher productivity’ because they do not take into account the input costs. They just consider the harvest.

3.7.10 Natural and changing climate

The climatic conditions of Lesotho result in frost, droughts and hailstorms that undermine the MFS and farming in general. For even when Machobane developed the system some 50 years ago, he developed it partly to address the risks of droughts and hailstorms. Over the last few decades, the climate has been changing for worse. Farmers and trainers interviewed feel that droughts have become more frequent, rainy seasons shorter and that the occurrence of frost is no longer predictable. One interviewee, an MFS promoter noted, “You no longer know when frost will hit. So that is the problem... But this time it hits any time it likes. Like last week [end of September] there was snow.”

3.8 What factors enable, constrain and underlie the learning and practice of MFS?

3.8.1 Resources

One of the major limiting factors in the learning of MFS is funds. NGOs that promote MFS have inadequate funds to do so and in some case have had to shelve its promotion. Government, which potentially can enhance MFS learning, has not been setting aside the necessary resources for its dissemination through NGOs, nor has it been investing in making sure that its extension workers are conversant with the system. Other aspects of learning that are negatively affected by limited funding are follow up support, doing look and learn tours, and the time that trainers and farmer can spend learning about the system. Farmers also face problems of funds to buy inputs such as seed. Some farmers do not own land hesitate to invest in MFS when their hard work could be taken away by the landlord any moment. This instead encourages the learning and practice of extractive agriculture that does not consider sustainability.

Labour intensiveness has been attributed to unavailability of farm implements, which in turn is caused by lack of effective demand for such implement to warrant corporate investment in such ventures. This can be traced down to the nature of capitalism, which only does things that have potential for economic returns and the inability of farmers to afford them. A related issue is the ever increasing price of input such as seed, which make agriculture expensive. The retrenchment of Basotho men cut cash inflows among rural communities who used it for household needs, including agricultural work. Poor funding of the NGOs undermine their extension activities, which in turn de-motivate MFS farmers, “*But like I said, they are now on their own because we no longer have funds for extension to support the activities.*” This poor funding is in turn linked to donor policies, which are affected by the politics and economic performance of their countries.

The corporate sector has an interest in the conventional agriculture because it builds on the inputs that come from agro-companies. They have also exercised their agency in trying to maintain the status quo. Some seed companies were reported to come into Lesotho from neighbouring South Africa to promote their agricultural inputs among farmers. The current seed certification standards for example, tend to favour companies who have the necessary

resources for treatment, branding and packaging. There is currently no alternative system of formally controlling seed quality other than the one in the conventional system. This practice ensures that the seed companies, most of them multinational, continue to control the supply of seed.

3.8.2 Time and space

Time in the learning and practise of MFS is not just a medium through which things happen, nor is space. The two affect learning and practice in many ways. An MFS trainer illustrates that time is not just a medium, *“So we are saying **in 5 years time, the soil will have improved so that would be the basis that was the basis. Then you find that after 5 years if we started with 100 you find that we have 50 or 60. And then those 50 will get certificates. Saying you have completed 5 years of competence in this farming system.**”* Machobane spent **13 years researching** on the MFS before you started promoting it in Lesotho. It is also with time (and practise) that after mastering the relay intercropping and achieving food security the farmers could then move into specialised activities such as livestock keeping. The Foundation gives support of an average of two hours per month to each farmer (in groups) because farmers do not want such contact time to be too long.

It takes **time for a trainer to prepare** to train farmers and it also takes **time for farmers to internalise and master** a practice. In the MFS, this takes five good years, which interestingly is about as long as most apprenticeship programmes in vocational education. One of the reasons for needing this time is so that the soil would have built fertility and water conserving powers. This reason has a space dimension because in countries or (such as in the mountains of Lesotho) places **where soils are already good, it does not need so much time**, if any to make it productive. Some soils may be fertile but acidic as is the case with 60 % of Lesotho’s arable land.

One of the reasons why farmers do not like to learn and practise MFS is that it takes time: **time to mix** the soil and the fertilizer, **time to plant** seed manually, **time to weed**. A group of farmers argued that crops grown using organic manure take longer to be ready for harvest than those on chemical fertilizer, *“We are not saying conventional agriculture can be better than MFS. What we are saying is the use of organic manure needs time but if you plant on time, you get better results but if you are not on time – that’s why we need chemical fertilizer because it can push more faster than organic manure. The organic manure will be slow, so that is the difference.”* This may be a factor associated with the availability of nutrients such as nitrogen but could also be to do with the planting of short-season varieties.

Seasonality combines the time-space dimensions leading to the production of some crops in certain seasons of the year. One promoter notes that frost-free periods are an important determinant of farming choices in Lesotho. Some crops prefer warm weather and others cool. Most of the farmer training in MFS is organised according to season so that farmers are taught about the crop that should be planted soon. Continuous use of agricultural space throughout the year to increase production and to manage possible crop failures due to natural problems such as frosts and droughts as on trainer noted during the study, *“And he found that this system that we call the relay intercropping, relay intercropping simply means that in every season of the year, there is something in the land. Whether it is winter or summer, well it is spring now – there must be something in the land that is growing and he must, that*

somebody must be harvesting something at that particular time. In summer too, the same. In autumn, in winter, the same ... you harvest almost every season and you can't be short of food."

In MFS farmers are advised to plant at particular times of the year and wait for the rains to come so that the crops can also take advantage of all the rainfall. As a result, they normally have the first crop on the market. An average household practising MFS in Lesotho can live off an acre of land. This is achieved through relaying cropping that allows about four harvests to be done in a year. In a sense the **MFS uses time to „expand“ the space** by planting four times in a year instead of once. The one acre becomes four. At the same time, declining rainfall in Lesotho – the space – is causing some farmers to till smaller pieces of land which they can irrigate with the little water available.

It takes time to **build both local and national farmer organisations**, which are essential for building and exercising agency in the interest of MFS and other sustainable agriculture activities. The farmer group that RSDA has been working with since 1995 is only now working at constitution development, leadership development and working towards registration. Similarly, the participants of sustainable agriculture farmers in the 2002 World Summit on Sustainable Development which culminated in the formation of Lesotho Small Scale Farmers' Forum whose purpose is to build farmers' ability to network, influence agriculture and trade policies and do sustainable agriculture effectively, considerable time to build membership at district level and to register.

The spatial considerations in the MFS might have created its **context-specificity**, for example, the emphasis on Sesotho dairy and poultry, the infusion of Basotho traditional practices such as *mafisa*, and the planting calendar might have been taken at face value not as something underlining the principle of suitability or adaptability. *“Special about the MFS is that the system was formed in Lesotho under the conditions, the Lesotho climatic conditions, solely to address the lot of the people especially in the rural areas”*. The context specificity provides part of the explanation for MFS not having spread as widely as other sustainable agriculture practices such as Permaculture and Organic Farming.

3.8.3. Interplay between MFS promoters and government institutions

Promoters of MFS have and are engaging with government, the university, the agricultural college and local leadership in order to cause its acceptance to become part of the everyday practices of the Basotho. The **interplay** between MFS agents and government structures has resulted in **interpenetration**. For most of the half century in which the MFS has been promoted, the government structures have resisted it, and reproduced conventional high-input agriculture using various strategies. More recently, the agency of MFS practitioners have gradually influenced government and university thinking but have not yet effectively changed mainstream practice.

First it was the colonial government that discredited MFS ostensibly because it was not scientific, was backward and primitive but really because they were afraid of his potential political influence. The post-independence governments did not trust his intentions either. He was therefore occasionally arrested and had to spend a decade (1970-1980) living in semi-hiding (Machobane & Berold, 2003). Some of the strategies that were employed to reproduce

conventional agriculture and repress MFS are the government's messages that were repeatedly deposited in the minds of the people: that the MFS was primitive and backward, "... sending us back to where we came from 100 years ago" as one MFS promoter put it. Universities and government agriculture colleges were modelled around modern agriculture and employed people who had such an orientation and knowledge, thus reproducing graduates that promote conventional agriculture. The agricultural scientists, nourished by western agricultural knowledge and thought, rebuffed attempts to have MFS recognised because it did not follow the logic of what they had been trained to accept. One of these scientists, who turned to MFS initially because he was looking for something special about Lesotho, encountered obstacles when he first changed his position on MFS by accepting it and wanted to promote it among researchers —. *from the Lesotho agricultural college I was transferred to the Director of Research – Department of Research. I thought there I could easily practice MFS – to research on it, find what makes it tick. But even there I was rebuffed by fellow researchers.*"

Currently the government promotes two agricultural schemes, the **block farming** and the input trade fairs, which tend to favour conventional farming and undermine MFS, thus reproducing the conventional agricultural system. Although in government policy, the MFS does not have budget allocation to make it happen at national level. With decentralisation of budgets to district councils, a similar budgeting pattern is reproduced and there are no government-supported MFS programmes. So far district councils have been implementing agricultural programmes that have a conventional agriculture orientation, reproducing the 'global' system locally. Intergovernmental structures such as the United Nations Food and Agriculture Organisation (FAO) which supports the input trade scheme carry **symbolic power** and are listened to by government officials – thus perpetuating the status quo in terms of the kind of agriculture that is in the mainstream.

However, there are a number of ways in which MFS practitioners are **exercising their agency** with some degree of success. The granting of a doctorate to Machobane for his development of MFS served as one of the most important signs that the government was about to accept the practice and some morphogenesis, some change on the agricultural landscape was about to take place. But it took more than 30 years of agency, for the government to get to recognise the system as an innovation. One of the important steps towards emboldening the agency of the MFS was when Machobane established a college where he trained some 200 tutors before it was closed in 1965. The tutors served as agency with the necessary knowledge, experience and conviction to teach other farmers the MFS. From the 1990 several NGOs, including RSDA and Helvetas and programmes such as Soil and Water Conservation and Agro-forestry Programme (SWACAP) began to openly promote, MFS. The MADF was also established in 1993 to ensure and oversee the promotion of MFS.

Another development which has enhanced the agency of MFS is that a few key people in the agricultural sector, who have **cultural power and a high position** in the sector, have decided to work with and support MFS. The director of the Foundations holds a doctorate in the field of agriculture – conventionally trained. He has significant power of agency because of his high level of education, his credibility in government, research and learning institutions of the country. Being a PhD holder and working to promote MFS seems to be shedding the practice in different light – in a sense, altering its identity – and prompting some scientists to pose for a moment before dismissing the practice, *–Even in the Ministries, when I went there and*

looked for this place, I went to ask for it, and they look at me and they say, it must make sense – if this man wants it. So in that way yes, it has that influence, which leads to more acceptances of the MFS”. Even the professor who once complained about MFS discussions being time-wasting and not seriousness a decade or so ago has since changed his position on the system. Having such learned people on the side of MFS is gradually transforming the structures so that they accommodate and promote MFS. Having had a more broad-based agency, which involved local and international institutions, over a period of nearly 20 years, the agency of MFS promoters is beginning – and only beginning – to have a telling effect on the attitude towards the practice. It takes time to change perceptions and attitudes, which have a bearing on practices. And there are interests too, to deal with.

One good place where there is evidence of the acceptance of MFS in particular and sustainable agriculture in general is the inclusion of NGO leaders promoting MFS and Conservation Farming on the Board of the Lesotho Agricultural College. This enhances the potential for MFS-driven agency to influence the curriculum taught at the college, and therefore on the kind of extension workers who end up working with thousands of farmers or move into government administration and allocate funds for agricultural activities. However, the fact that the college is accredited by the National University of Lesotho means that there are more structures to influence before **morphogenesis** can progress. The planned establishment of MFS demonstration plots at all District Agriculture Offices can help promote agency by showing farmers what is possible and ‘encouraging’ them to seek extension support.

The forces that keep informs the government policies may be located in its **value system** which appears to privilege conventional agriculture, allocating it virtually all its agricultural budget and employing the other necessary resources such as personnel to do it. The Lesotho land tenure system in which farmers rent land from other people does not encourage farmers to invest in soil improvement because the land owner can take it back any time. The migration of youths and children into urban areas, away from rural areas where farming takes place can be seen as a response to the greater learning and employment opportunities found in urban areas compared to rural areas. This can also be further linked to the government policies on development. This value system is supported by **cultural and economic power**. The educational policies of government prohibited the teaching of MFS and this was enforced through exclusion in the curriculum and ‘banning’ talk of the practice in the schools. The agriculture officers in government, the research scientists in universities and government have considerable cultural power as ‘educated’ people, and carry symbolic power given to their education and they occupy positions of influence. MFS farmers and promoters on the other hand generally have less or limited very limited positional, cultural or economic capital.

3.8.4 Interplay between and among MFS farmers and promoters

One of the potentially important sites to look at in seeking out factors that enable and constrain MFS as a practice is the relations within the community that it is practised. These relations may be among the MFS farmers or MFS promoters or between these two different groups of people. The study revealed that there are several activities and processes that enhance relational agency. These include MFS farmers working together in pest control and they share medicines as is common in farmer field schools; MFS working together in each other’s fields to do labour-intensive and time-demanding activities such as potato planting

and maize planting. This does help them learn from each other. Helping each other with resources like manure and small livestock also increases the overall ability of a community of farmers practising MFS to do it effectively. The relations between the main promoters of MFS – the MADF and RSDA (and in the past Helvetas) are underpinned by trust, partnership and regular communication which enhanced **relational agency**.

However, relations between MADF and many other NGOs promoting MFS are too weak for effective relational agency. The Foundation does not trust the adequacy of other NGOs to train in MFS because some of them do not teach the right things. And the NGOs do not seek the necessary guidance from the Foundation. This can result in different messages and wrong techniques being promoted.

The relations between farmers and promoters of MFS seems to be generally positive but there frequency of interact is too low for effective relational agency. This was revealed by one of the farmers during the study when we visited their group. The statement of the farmer, made in Sesotho, was translated into English, *“He says just because we [The Machobane Agriculture Development Foundation] without visiting them, they were actually discouraged and they were confused... Yaa they say they have problems getting some seeds, like for instance, potato seeds. But with the follow up that is made by the Foundation, well they can overcome, they can get to know where they can get the seeds and the other things.”*

While development facilitators have been exercising their influence on government and academia through training farmers who then produce enough to try and convince policy makers, administrators and educators that the system workers, sustainable agriculture farmers have also been trying other means, albeit with the support of NGOs. Sustainable agriculture farmers in Lesotho joined farmers from other parts of east and southern Africa (and beyond) in Johannesburg during the World Summit on Sustainable Development (WSSD) to attend the Small Farmer Convergence convened by PELUM Association. The later is a regional network of NGOs working in east and southern Africa and promoting democratic sustainable agriculture and natural resources management. The Convergence culminated in the setting up of a regional network of small scale farmers that are involved sustainable agriculture, which has national chapters such as the Lesotho Small Scale Farmers’ Forum whose mandate is to engage government and other stakeholders and lobby for sustainable land use practices. The farmer organisation, which was registered hardly two years ago, has not had time to make impact, but has great potential to do so, especially when it comes to budget allocation. The farmers’ organisation is setting up structures at district level. At the same time, the more localised setting up MFS farmer groups, alongside training in leadership and bookkeeping, has the potential to increase the clout of MFS farmers to organise themselves and challenge structures and systems that constrain their activities and practice, thus bolstering their agency to change the status quo.

Globally there is an emergence of such structures as the Global Forum of Agricultural Research (GFAR) and Forum for Agriculture Research in Africa (FARA) brings different stakeholder groups in agriculture to plan research together. SADC has no similar sub-structure but the Department of Agriculture and Natural Resources in Botswana hosts that function. At national levels, most countries have set up National Agricultural Research Systems (NARS) to replace National Agricultural Research Institutes (NARIs) and ensure that the voices of the marginalised farmers and other civil society organisations are heard and research activities respond to farmer needs. Representation will not ensure transformation of the agenda and research activities because there are power relations between stakeholders that

may be used to undermine or sideline some stakeholder groups. But the stage is set for engagement. The dominant discourses of democracy and sustainability and the values they carry seem to be at the bottom of processes that empower farmers to build sustainability in their practices.

3.8.5 Habitus¹¹, identity, and tacit knowledge¹²

Some deep-seated dispositions and the Basotho people's identities are also having different effects on the learning and practice of the MFS. Some of these are being changed in order to generate different and more desirable dispositions and identities in the light of changing global and local discourses, especially around the notion of sustainability – economic, social and ecological. The founder and innovator of the MFS, Machobane was born to sharecroppers, successful farmers. He grew up farming and had farming in his veins, so to speak. When he tried to move away from farming but encountered poverty, he sought for different solutions and he arrived at farming as the primary solution to poverty in Lesotho – as if the pull of the past, his past, offered a solution that he would understand and execute.

One of the agricultural trainers went into training because *“Agriculture has been my area of interest since I was growing up.”* However, there were certain challenges in his social life, not having enough money to pursue the kind of agriculture that he wanted. So the economic capital, limited his choice, at least for some time, of the kind of agriculture he wanted to pursue.

Being a Basotho meant so much to an agricultural scientist that he decided to look for MFS with a view to understanding it and enriching it as a local innovation. Trained up to PhD level in the field of agriculture, plant protection, the man was inspired to adopt a locally developed system by someone never trained in agriculture because his national and African identity meant so much to him and he wanted to use his knowledge to contribute to the further development of the system. The same man, and others, is aware of the need to build an agrarian consciousness and something is being done about it *“Now, with the kids, we want them to grow with the system. The MFS should be part of their lives. They must not find it when they grow up when they go back home, they tell their mothers, they tell their grandmothers, I will do this, and that and that, on the ground.”*

But it takes time for people to change dispositions and identity, time and something to convince them. This can partly explain the relatively slow pace of adoption of MFS. The story of the PhD holder is a case in point. A similar one was told by one of the trainers who initially dismissed MFS, *“So with me, I was still in the Ministry of Agriculture, working at research under horticulture and I never thought that one day I would find myself joining the*

¹¹ Habitus can be seen as “systems of durable, transportable dispositions, structured structures predisposed to function as structuring structures, that is, as systems which generate and organise practices and representations that can be objectively adapted to their outcomes without presupposing a conscious aiming at the ends or an express mastery of the operations necessary to obtain them” (Bourdieu, 1990, p. 52).

¹² Tacit knowledge is **not** silent knowledge, but “... something which is pre-understood as a background to what we are doing... tacit knowledge is built into different handicraft, traditions, usually over very long periods of time ... is what is unsayable, but possible to show in what we are doing, what is shown and visible, and what can be interpreted in art or handicraft” (Gustavsson, 2007, p. 322).

MFS and practise it". And at least two decades later, when he was asked to join and promote it, he agreed and told farmers to do what he was not doing – but practising what he was taught and had taught for his whole professional life-time, *"But I wasn't practising the system myself, no, no, no, no. I was using fertilizers. Here and there I could use organic fertilizers like kraal manure but not the others."* In a sense, his identity changed from been a conventional extension worker to that on a sustainable agriculture development facilitator but he was still a conventional farmer. His dispositions had not changed enough. And that must have created tensions in him that needed to be resolved. A few years later after working with the system, he is practising it, walking his talk. Before then, those farmers who must have seen him practising conventional agriculture and yet promoting sustainable, must have been confused. This could only have had a constraining effect of the learning and practise of MFS. Changing identity, changing dispositions means letting go of what one is used to do, conditioned to do by society. And it is often a difficult process as the same trainer illustrates:

I was used to weighing things. You weigh seed, you weigh fertilizers, and you know what rates are you going to apply and what type of soil and those things. So when I came here I found that these people are doing it the way I don't understand it. So they were using their own hands, they are using their feet. So I found that aah I can't cope with these things. But I had to learn, I just had to learn.

It is difficult, if not impossible for people to foster the creation of dispositions or identities that they do not possess – like building sustainability into their practices, when their experience has not exposed them to that. This is worse when they do not have the knowledge to do so. Extension workers and other agricultural personnel who are trained in conventional agriculture are finding it difficult to implement sustainable agriculture policies *"... but the people who are supposed to implement these things are not convinced that this is the way to go because their training is on conventional agriculture ... because I can say even if they would like to do it, they are not ready... they don't have exposure ... they don't know what is there."* Extension workers tend to promote those crops that have a long history of success in the country too, what is known and has a history, a familiarity, *"That is why they would support varieties that are well established in Lesotho – well known, there are no problems, you know those that will do better."* Some of the varieties being promoted by MFS are not well known to the government extension workers because they are not hybrid seed, but open pollinated varieties (OPVs).

The two farmer groups repeatedly pointed out that some people (farmers) do not take on MFS because they are laggards – *they are lazy*'. Even when it came to discussing the question of division of labour, the determinant was not gender or age but whether one was lazy or hard working. Either their bodies are not used to hard work or they just don't have the right attitude to apply themselves – or, as could be expected in places of high incidence of HIV and AIDS, many have become too weak to work hard for long. In a sense therefore, the energy and will to work has affected the extent to which MFS has been learnt and practised.

One of the strategies that have enhanced the acceptance of the MFS among the Basotho is the incorporation of some of their traditional practices such as intercropping, the farmer-trainer/tutor selection system based on Basotho circumcision schools, the farmer to farmer extension system and working collectively in each others' fields, under a system called *matsema*:

There is another thing that is called matsema – collective working in the villages. For example, during harvest time, people, local people help each other. We go to your field and then once we are through with your field, we go to another field. Yes, they call it matsema. That also is incorporated in the MFS and helping each other, ‘you have been helped, so help others too’. Yes, that is the policy of the MFS

Animal farming is based on two traditional concepts of Basotho: *lesielo* and *mafisa*. *Lesielo* is the loaning out of a female animal in order to share the offspring and done using both small and large livestock but mostly with livestock that gives multiple and frequent births. *Mafisa* is looking after the livestock of another person in order to benefit from the by-products such as dung, draught power and milk. Big livestock is often used in this approach. The principle that seems to underpin these traditional practices is support for the less fortunate – those without assets – to feed themselves and build economic assets at a price they can afford.

Documentation has been cited as one of the challenges in the learning of MFS. This can be partly attributed to the practice nature of the system. Most of it has to be taught by doing and is difficult to encode. This is the case with practical knowledge, tacit knowledge – the knowing how to know how knowledge, which is difficult to say, to put into words, to write. Manuals can only go so far even if they were sufficiently developed and available. When I asked a promoter a question about how they practised a certain aspect of MFS, here was their response, “*You know, we are here but when we are in the field, you could see how they do it.*” A related statement was made by another trainer who said, “*More emphasis was on the practise than theory because everything has to be done on the ground*”. Even the PhD holder said something to acknowledge the difficulties associated with articulating some aspects of practice when he said, “*Fortunately, the system really works. It defends itself, provided you practise it properly. It proves itself from time to time.*”

3.8.6 Poverty and HIV/AIDS

The study revealed that there are some structural and causal mechanism which enable and others which constrain the MFS. Some like poverty have a dual effect. Poverty encourages farmers to adopt MFS because it is affordable. At the same time poor people readily obtain and use free agricultural inputs such as hybrid seed and chemical fertilizers. In this way, poverty can create dependency syndrome among some rural communities, undermining MFS. Similarly, HIV/AIDS is pushing people to look for food that is nutritious, safe and fresh, which MFS promotes while at the same time killing farmers and draining them of their energies during illness, factors that undermine agriculture, especially labour-intensive MFS. Poverty and unemployment cause stock theft for slaughter or exchange in South Africa, thus reducing cattle for draught power and kraal manure production. Turner (2003) shows how poverty and stock theft interplay:

Stock is stolen because there is very little else to steal in the mountain districts... It is clear that the overriding cause of stock theft is poverty. Respondents consistently rate joblessness and poverty as the primary reasons that theft has become endemic ... unemployment has increased substantially throughout Lesotho since 1990... Not surprisingly, it is reported that stock theft increases following poor harvest... stock theft is a result of poverty, stock theft increases poverty and stock theft begets stock theft (Kynoch & Ulicki, 1999, p. 9, in Turner, 2003, p. 39)

Nevertheless, Pantalani (1996) makes the point that the decline in the number of livestock is not the most important factor in the amount of cow dung available. It is the amount of feed that is available to animals. The most critical times being the dry season when there is little fodder. He reckons that this can be connected by increasing feed and keeping cows in kraals in even in the dry season. The other variable that needs to be managed for greater availability of kraal manure is cutting in the use of dung for fuel. Matsipa (2008) reports that 50 % of cow dung from kraals is currently used as fuel and suggests tree planting to save dung and to provide wood ash.

3.8.7 Ignorance about the MFS

Ignorance about sustainable agriculture explains why government extension workers cannot and do not promote MFS. They cannot promote what they do not know or understand “*So when people come asking questions they want to have answers. They want things that they know*”. This ignorance at individual level can be reinforced by values that privilege conventional farming. Bureaucrats who serve in the government also face a similar limitation because they were trained in conventional agriculture, not sustainable or MFS.

3.8.8 Power relations

The power relations that exist between different actors **underlie** the extent to which MFS can be learnt and practised. The government has the political power to decide on policies, the corporate sector has the economic and cultural power to push high external input agriculture. They hire the bright and learned in the community. The donor community has economic power as well as the power of persuasion. Those donors with an interest in conventional agriculture sponsor such programmes while those with an interest in sustainable agriculture do the same. The latter seem to have far less resources to invest. The universities and colleges have intellectual or cultural power, which has generally tended to reproduce western knowledge and agricultural practices. The economic power of government, partly derived from donor aid from pro-conventional agriculture countries, has resulted in some programmes that entice farmers by providing free or subsidised inputs. However, these subsidies sometimes come late, farmers wait for them and delay planting, leading to poor harvests (Abbot, 2002). International NGOs operating in the country and involved in sustainable agriculture have more economic resources that have allowed them to also provide some free inputs but their programmes tend to be less extensive, covering fewer areas and shorter periods. At district level, through the government decentralisation programme, District Councils have powers to decide on which activities and programmes to fund, including those of an agricultural nature. Within the communities there are power relations between the landlords and the landless, with the latter being dependent on the former. Those who rent land – often on leases that last a few years – are discouraged from building the ecology of the soil because the lease can be terminated any time.

3.8.9 Climate and soils

It was the recurrent droughts, the hailstorms and frost that compelled Machobane to develop the MFS. These are caused by natural atmospheric processes. However, in the last two decades or so, there has been growing concern and evidence of global warming and climate change arising from greenhouse emissions. The frequency of droughts in Lesotho has increased since 1978 and the longest drought in 200 years occurred between 1991 and 1995

(Chakela, 1999). The short or shrinking rain seasons are forcing some farmers to prefer agricultural practices that ensure early harvests. Some farmers are concerned that the MFS is not responding adequately to the need for early harvest. The relatively high acidity levels of the soils in arable parts of Lesotho and their low organic matter content can be traced back to their origin, the parent rock.

3.9 Conclusion

The study revealed that there are several personal reasons why farmers choose to learn MFS and practice it. Some farmers are attracted to MFS because it is cheap and affordable even for the poor; it generates economic gains too. Others were inspired by its ability to build the soil because they want to bequeath better land for future generations of family members. Many find value in MFS because of it provides a foundation for solidarity with other farmers to meet their social and practical agricultural needs. MFS farmers are primarily using scaffolding to learn alongside collectivist learning where they work jointly to develop solutions to their problems. There is, however, very little learning associated with linking everyday knowledge with scientific knowledge. Most of the learning is practice-based through such activities as demonstrations, look and learn visits and implementing projects. The learning is context dependent too, with a lot of what farmers learn being based on local seasons, local soil conditions, local language, and Basotho indigenous farming knowledge. The study identified a good number of contradictions that can serve as potential areas of improving the learning and practise of MFS. These include the inadequate research and documentation; incoherencies in the articulation of the system; inadequate financial and human resources; lack of political will on the part of government; clashes with powerful interests of the corporate sector; and the double stigmatisation of sustainable agriculture. The constraints and underlying casual mechanisms include poverty; HIV and AIDS; time and space; climate and soils; habitus and identity; ignorance about MFS; power relations between those promoting MFS and those defending conventional agriculture. The time and space dimensions were linked to time to learn to teach others, time to master the practice, build the soil, understand cropping systems, graduate to more specialised production; time to influence policies; time to work with other like-minded organisation to develop common messages; time to find contradictions and to address them through long expansive learning cycle.

The study also made strong suggestions as to why MFS has not far and wide outside Lesotho. These include: the government policy of discrediting the practice; the limited scientific data and general lack of documentation which resulted in limited resource materials; the context specificity of many of the tools, including the planting calendar, the forms of solidarity and the main language used. What remains to be done in the next phase of the study is the identification – by research participants – of important issues to which the study should respond using tools such as CHAT and its expansive learning cycle, so that together we can model solutions.

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4.5.1 Example of feedback on report

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Cc: seketef@rsda.org.ls

Dear Mutizwa

I went through your conference paper and it is truly insightful. While I am not very familiar with this approach in theory, it is very interesting how it all comes together that challenges are a major force behind learning for change.

On the part of MFS, I am sure you have implied it in your write up that MFS is built on three pillars which can be referred to as a pyramid of development (technology, self transformation and mass education) i.e "stick to thy hillock" representing the environmental circumstances in which farming occurs including planning for the climatic hazards and thereby deliberately including "relay intercropping" in the farming method (technology); "first develop man and man will develop the land" - self transformation through learning (including the MFS philosophy, internalization of concepts etc.) by doing within the farmer schools and

finally, the mass education - a social duty/ responsibility that the neighbours are influenced by MFS practitioners (I guess in the theory you use for analysis then this would equivalent to the "externalization").

Very interesting indeed. Tell me what you think of the paragraph above.

Cheers and good luck to you, Letla

4.6 DRAFT REPORT ON THE MACHOBANE FARMING SYSTEM WORKSHOP HELD IN MAFETENG, LESOTHO ON 25-26 MARCH 2009

1. BACKGROUND

Prior to the holding of the MFS change laboratory workshop, the researcher had conducted a one week visit to the country and met about 40 people practising or promoting MFS and interviewed them. All the farmers (35) where interviewed in two groups and the remaining 5 research participants were interviewed in four individual interviews and one group interview of two. Among other things the study identified problems (contradictions and disturbances) within and around the MFS. Other problems faced by MFS were identified through document analysis and literature review. These problems were used to stimulate discussions on learning MFS and developing it during the workshop under discussion.

The workshop was organised through and by Rural Self Development Association (RSDA). It was attended by 15 people: 7 MFS farmers; 2 MFS facilitators (one from Machobane Agriculture Development Foundation and the other from RSDA); 4 government extension officers from the Mafeteng district in which the workshop was held; and 2 researchers from Rhodes University.

2. DAY 1

2.1 Setting the scene of the workshop

2.1.1 Welcome and introductions

The RSDA dairy officer asked participants to pray as a way of opening the workshop. Participants responded by singing a hymn before praying. He then welcomed all to the venue and asked each person to introduce themselves. There were six MFS farmers, one MFS tutor and 1 government agriculture extension officer when the workshop started. However, by the time the workshop ended, three more participants had turned up: three district agriculture extension officers from government; and 1 MFS facilitator from RSDA, and one MFS farmer. Of these 13 participants, five had taken part in the interviews conducted in August 2008. The farmers introduced themselves in the local language, Sesotho and the HIV/AIDS officer did the translations for us. The workshop agreed that the working language for the workshop would be Sesotho.

2.1.2 Workshop objectives

The facilitator introduced the workshop objectives as follows:

- a. To share the history of Machobane farming system in our areas;
- b. To identify and share problems faced by farmers in learning and practising MFS;
- c. To select and analyse some of the problems;
- d. To develop solutions to selected problems; and
- e. To plan the way forward

The RSDA HIV/AIDS officer, who attended the workshop for much of the first day, did the translation of the objectives into Sesotho the local language. After presenting the objectives we negotiated and agreed on starting and ending times as well as allocated time for teas and lunch.

2.2 Historical timeline

2.2.1 Group discussions and construction of historical timelines

Participants went into three groups and develop a historical timeline of the MFS in the area or family. The two farmer groups were determined by where the farmers came from and the third group was made up of an MFS tutor and the extension officer, where the MFS tutor was to give her historical timeline. Each group had to give the dates; events; their causes and effects (comments).

2.2.2 Presentations of and comments on historical timelines

Farmers presented in Sesotho and the RSDA dairy officer translated into English. Arrangements for translations of presented material into written English were made. Each group had a turn to present. The following historical timelines were presented:

a. Thabaneng group of farmers

Dates	Events	Causes and effects
1995-1998	<ol style="list-style-type: none"> a. This is the time when we knew about Machobane from Ntate Machobane the founder b. People did not like it by saying it is labour intensive c. The system realised increased yields and people from Thabaneng in Mafeteng joined Machobane farming system 	<ul style="list-style-type: none"> ● Increased membership as there was support in terms of seeds ● Soils were improved with locally available resources ● Increased yields
2000	<ol style="list-style-type: none"> a. RSDA stopped providing seed assistance to farmers (this involved farmers paying back with an additional 20 % of seed loaned) b. Farmer group started to buy inputs collectively 	<ul style="list-style-type: none"> ● Membership started to decline in great numbers ● Those remaining continued to implement the system ● We became independent because of the decline in seed support
2002	<ol style="list-style-type: none"> a. We improved our seed saving and buying 	<ul style="list-style-type: none"> ● The yields became better

	system	than before
2008	a. We managed to get legally registered with the Law office	<ul style="list-style-type: none"> Became legally recognised as a farmer group

b. Ha-Moletsane farmers group

Dates	Events	Causes and effects
2003	a. Knowledge about Machobane farming system b. Training in Machobane system c. There was a group of interested volunteers that agreed to practise Machobane d. The volunteers named their group Ipheliseng Bataung and elected a committee e. The group drafted the bylaws to govern themselves.	<ul style="list-style-type: none"> Poverty was the cause of why people got involved in MFS Lack of jobs was another cause Peoples knowledge about Machobane improved
2004	a. People started practising MFS	<ul style="list-style-type: none"> Yields improved
2005	a. We visited Zimbabwe, Zambia and Malawi	<ul style="list-style-type: none"> Learnt new farming methods, including pot-holing
2006	a. Our member visited Qacha's Nek	<ul style="list-style-type: none"> Learnt from other farmers
2007	a. We started fundraising (Stockvel)	<ul style="list-style-type: none"> Raised funds for buying seed
2008	a. We managed to buy seeds	<ul style="list-style-type: none"> We managed to have our fields planted

c. Me"Norah, the MFS tutor"s historical timeline

Period	Events	Causes and effects
1978-1992	a. Mr Machobane asked for a piece of land which is about half of an English acre from a farmers garden and planted different kinds of crops (onion, green peas, potatoes and tomatoes). b. My work was to plant, weed and to care for crops in general c. After the first and subsequent harvests, the area was gradually increased and more hands were needed d. The crops were grown for home consumption and sale e. There were other people who were hired to work in the garden and were paid daily and monthly f. As time went by and more land was put under cultivation, the number of workers was also increased, including kids that	<ul style="list-style-type: none"> There were increased yields Creation of more jobs Some of crops were attacked by cutworm of which we controlled by the use of bones. Increased yield of crops and fruits Good relations and cooperation with people on the street

	were found in streets and they were paid with food and money daily	
1992-1996	SWACAP (Soil and water conservation and Agro-forestry project) met with Mr Machobane and decided to promote intercropping with fruit trees through the Machobane Farming System	<ul style="list-style-type: none"> • Increased yields of crops and fruits • Increased income • During harvesting relations would be improved as everyone would have something to take home
1997-2009	<ol style="list-style-type: none"> a. SWACAP support of Machobane farming system came to an end b. Machobane stands on its own c. Children from primary school and High schools got involved in Machobane with emphasis on vegetable production to address issues of HIV and AIDS 	<ul style="list-style-type: none"> • The good nutrition in organically produced food from the Machobane farming system is considered better for those infected by HIV and AIDS because it has better nutrition

2.2.3 Discussions of timelines

At the end of each presentation, comments were made. For the first farmer group, the following discussion happened:

- a. **Ntabaneng group:** Their main comment was about how they claim to have improved soils. They made an explanation concerning improved strip farming but even after the explanation it was not clear to most participants what the improvement was. It was agreed that they would draw a diagram to illustrate the changes and present the following day. They were also asked about if and when their group was registered, to which they answered in the affirmative, in 2008.
- b. **Ha-Moletsane group:** They were asked if they had had any interaction with the other MFS farmer group in the district and they said they did not. The other question was about whether some of the decrease in membership (from 27 in 2003 to 14 to date) was not due to death, to which they answered two. Most people left because of the labour intensiveness of the MFS.
- c. **Tutor group:** She was asked about the number of schools that are participating in MFS and she said they were seven, two of which belonged to the disabled. The schools programme was started in 1997.

2.2.4 Reviewing of the historical timeline process and outcome

The participants were asked to comment on the whole process and the outcomes of the historical timeline assignment. They made the following comments:

- a. Some things were omitted in the historical timelines.
- b. There is still need for clarity on improvements made by one group.
- c. Need to know understand how pot-holing, which was learnt by one group works.

2.3 Problem identification

2.3.1 Presentation of force field analysis

The facilitator presented force field analysis and discussed it with participants before asking them to apply it to analyse problems faced in learning and practising the MFS. The presentation was:

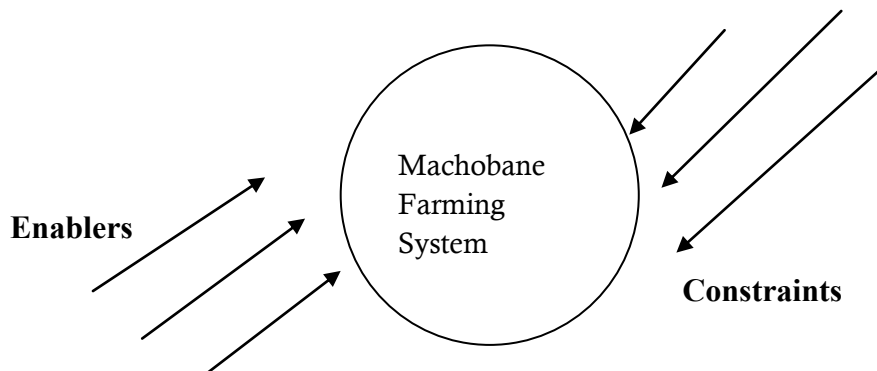


Figure 1: Force field analysis

2.3.2 Enablers of the MFS

Participants were asked to work in pairs and answer the question: *What factors are enabling the Machobane farming system?* Each pair was asked to come up with three enablers. In the plenary the following enablers and strengths of MFS were shared:

- a. Use of organic manure which conserves soil moisture;
- b. Able to plant and harvest many different crops in a small piece of land;
- c. Yields are high because of relay cropping;
- d. Willingness to work among the Machobane farmers;
- e. Working together of those practising the MFS;
- f. Crop rotation;
- g. Use of locally available resources, which are cheaper;
- h. Good at reducing pest problems;
- i. Good and better nutrition because the crops are grown organically;
- j. Use of organic manure, which is good for the soil;
- k. Group work makes work easier (similar to (e) above);
- l. Intercropping
- m. Improves lives of the people, which leads to a better nation –“first develop man and men will develop land”
- n. Follow ups, which are however beginning to decline.

2.3.3 MFS constraints

After the sharing of enablers and strengths of MFS, participants were asked to individually answer the question: *What factors constraint the learning and practise of the Machobane farming system?* The following constraints were identified:

- a. Lack of cooperation among some people working in groups (e.g. people whose fields have been worked by others not reciprocating);

- b. Pests;
- c. Labour intensiveness;
- d. Untimely planting;
- e. Limited availability of seed especially potatoes (they are available not available in the market at the right time);
- f. Theft by people not practising the system;
- g. Drought; and
- h. Lack of government support and lack of support from other service providers.

There was a question about why the group had treated pests as a problem in MFS and also as a strength of the MFS. The answer was that there are instances when MFS has been able to deal with the problem effectively and others where it has failed. This partly depends on the nature of pest and crop in question.

2.3.4 Presentation of 'mirror' data

The facilitator then presented to the group the problems that he had identified during the August research which involved MFS farmers, MFS tutors and the directors running two organisations that promote MFS. The following problems were presented:

- The MFS is labour intensive and time-consuming;
- Inadequate research and documentation of the MFS;
- Incoherencies in the MFS philosophy, principles, and practice;
- Double stigmatisation of MFS;
- Inadequate availability of inputs, learning materials and funds;
- Competing approaches to agriculture and MFS: ambivalent agricultural messages;
- Lack of meaningful support from government and agricultural research centres;
- Inadequate time to learn and build the practice;
- Natural climate and climate change; and
- Clashes between short and long term interests; between the ecological, social and economic.

2.3.5 Comparison of workshop identified constraints and mirror data

It was noted that there was considerable overlap between the problems identified during the workshop and those identified during pre-workshop research. The main difference was that the researcher's findings included the learning issues while the workshop's constraints did not. At the same time, the researcher's findings did not capture the more immediate problems of the farmers such as pests, thefts, lack of cooperation in groups, and untimely planting.

2.4 Problem Prioritisation

2.4.1 Choosing the problems to work on

Each individual was asked to write down the most important problem to which the workshop must develop a solution so that each person's issue was addressed. The following five issues emerged from the 10 participants, and were 'scored' by counting the number of participants (frequency) who identified it as an important issue to work on during the workshop. The table below shows the outcome of the process.

Table 1: Showing the problem selected for analysis and solution development

Problem	Frequency	Rank
a. Input availability/seed	3	1
b. Theft (and poverty)	2	3
c. Drought	1	4
d. Pests	1	4
e. Lack of government and NGO support including for agricultural research	3	1

The facilitator explained that the reason for asking each individual to write down their most important issue and have it read out was to ensure that everyone's point of view was considered in deciding on which issues to address during the workshop.

2.4.2 Group formation for problem analysis and solution development

After going through a number of steps to form two balanced groups in terms of possible knowledge distribution, participants were divided into groups A and B. The two groups worked on the five selected problems as shown below.

GROUP A	GROUP B
a. Seed supply issues b. Drought c. Theft	a. Lack of government and NGO support b. Pests c. Theft

2.5 Sharing a tool to guide solution development

2.5.1 Seven Steps in problem solving and solution adoption

The facilitator presented the expansive learning cycle, explaining how it works from problem identification to adoption of solution. Instead of putting it in a cyclical form as is normally the case, he presented it in the form of *steps in problem solving*. This was intended to underline the stepwise nature of the process and to avoid the potential difficulty that could arise from a figure that begins from the right, moving down and then to the left, which is not how people traditionally organise their written work. They ordinarily move from left to right, top to bottom. The steps were outlined as follows:

Step number	What is done
1	Problem identification from a practice
2	Problem analysis: history; causes; effects; trends; and scale
3	Develop solution
4	Examine solution
5	Implement solution
6	Review implemented solution
7	Adopted reviewed solution

The facilitator pointed out that Day 1 had already accomplished step 1; steps 2-4 would be covered during the second and final day of the workshop; steps 5-7 would be done beyond and outside the workshop but the workshop could design a process to ensure that the steps can be followed. One participant remarked that it was not likely to be possible to develop a solution to a long-existing problem in a matter of two days.

3. DAY 2

We began the workshop at 09.05 with a song and a prayer before going into reflections. The facilitator then presented a programme outline for the day which had the following items:

- a. Reflections on day 1
- b. Group work to analyse selected problems and develop solutions to them
- c. Presentation of group work
- d. Discussion of group work
- e. Planning the way forward
- f. Evaluations and closing

3.1 Reflections on the previous day

Participants were asked to individually reflect on the previous day and share their insights, or things that they feel they should have said but did not say. The reflection time took about 20 minutes and during the first five minutes participants were still reflecting individually. Participants shared the following reflections:

- a. I want to know more about the innovation that Ntate Ranthimo developed and alluded to yesterday – who taught him how to change the system, he should teach us too;
- b. Yesterday we discussed about the gap between the Ministry of Agriculture and agricultural NGOs but from different perspectives. I would like us to discuss more about this;
- c. The insight that I want to share with you is that the amount of ash and manure that one needs to apply will be determined by whether one is dealing with a leafy crop or a root crop;
- d. The Ministry of Agriculture only approaches us when they want us to take part in agricultural shows but it does not attend to our needs such as the need for irrigation equipment;
- e. Given the problems we heard about the MFS, I am wondering whether it is still alive;
- f. If someone is taught something new, they do not just rely on what they are taught, they also experiment and use their experience to improve their practice; and
- g. The insight that I want to share with you is that organic manure lasts longer in the soil than chemical fertilizers.

3.2 Changes in Machobane Farming System

At the end of the reflections, the facilitator pointed out that Ntate Ranthimo was going to share his innovation as requested yesterday. He had done his home work and brought diagrams that showed how the system operated, before and after the innovation. Ntate was invited to make his presentation which he made in Sesotho. The facilitator proposed that the presentation should go uninterrupted by translation and that the translations would be done later outside the plenary. The presentation and discussion lasted for about an hour and even the four agricultural extension officers in the room paid close attention, taking notes. They did not seem to query the logic of the innovation. In his presentation, Ntate Ranthimo highlighted the following points:

- a. Many farmers joined the system because there was input support in the forms of seeds of potatoes, maize, sorghum, beans, peas and wheat;
- b. Another reason for farmer interest was that RSDA provided training and extension, on the MFS;
- c. Farmers who were trained on how the system works were eager to get the benefits associated with MFS, that is, increased yields;
- d. Farmers did realize the results, but the amount of output was not what they expected and they asked MFS facilitators whether there were ways of manipulating the system so as to optimize the space that were between crops especially potatoes (2 metres apart).
- e. MFS facilitators from RSDA promised to look into the matter and later they came with the proposal of trying to reduce the space from two meter to one meter apart and the farmers looked into the proposed changes to the system and we farmers agreed to implement the trial.
- f. Some of the farmers took it upon themselves to try the new system (changes were in spacing and intercropping patterns) i.e. reducing the space from two to one metre.
- g. The main changes were that in the old system, maize, sorghum and beans would be sown in one line while in the new system, maize would be sown with beans in a line and in another line it will be sorghum and beans.
- h. In addition, another line of beans was added with the idea of increasing the yields of this crop and indeed farmers realized that there is more yield in the new system than the old system.

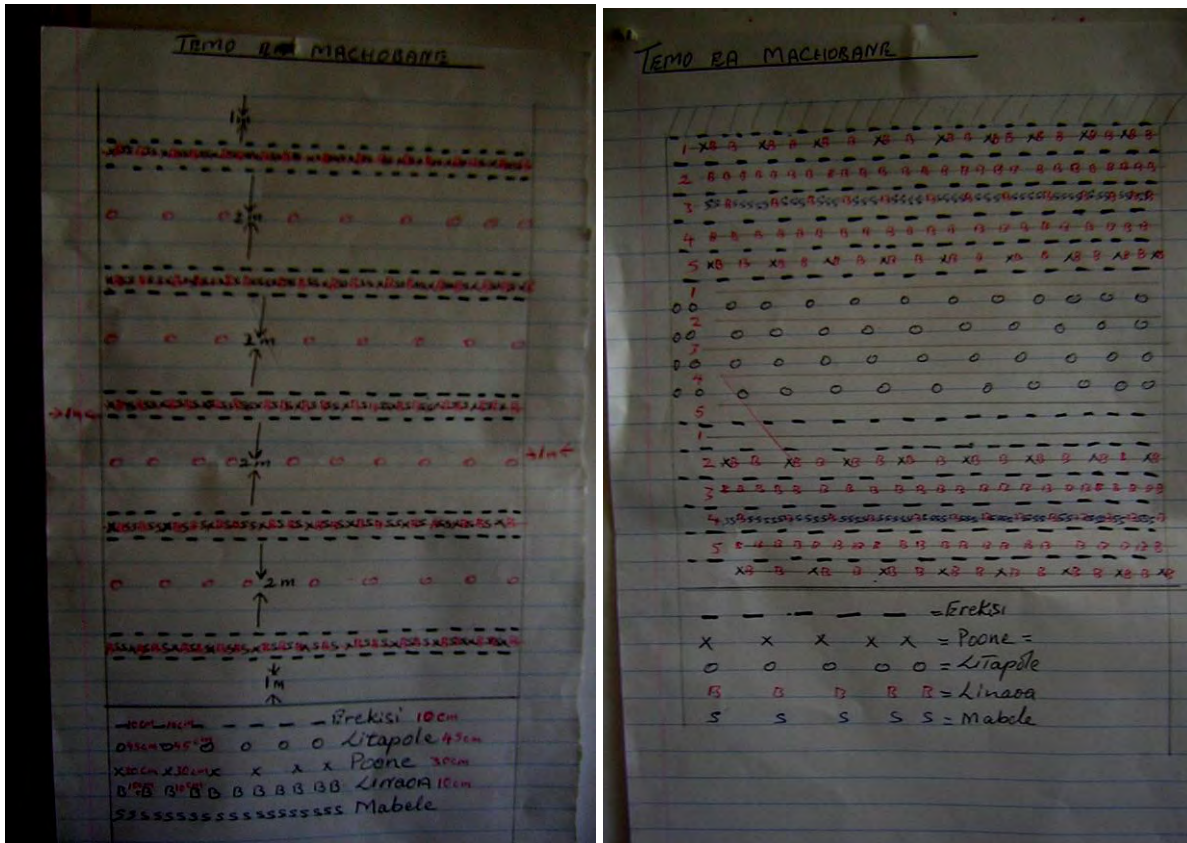


Figure 2: Comparison of MFS cropping system before and after the innovation

3.3 Comments on Ntate Ranthimo's innovation presentation

Participants were invited to comments on the innovation and presentation and the following points were made:

- Farmers do innovate.
- Learnt that I can plant cabbages after potatoes in order to control potato scab
- I would like to advice him that the problem of bean weevils might have been caused by the repeated planting of a certain bean variety. The solution is to change varieties over time.
- I would like to invite Ntate to our group so that he can explain this process to other farmers for their benefit.

3.4 Group work and presentations on problem analysis and solutions

3.4.1 Group B presentation of problems and solutions

Problem	Cause	Trends/History	Scale	Solution
Lack of Gvt and NGO support	<ul style="list-style-type: none"> • There is no joint planning • NGO don't report to GVT/Ministry • Ministry is Quite 	<ul style="list-style-type: none"> • No relations between GVT & NGOs • NGOs don't care/need GVT support as their support is from donors 	Whole country	<ul style="list-style-type: none"> • Farmers should enforce relations between GVT & NGOs
Pests	<ul style="list-style-type: none"> • Weed • Disaster • Persistent Drought • Donations • Laziness • Carelessness 	<ul style="list-style-type: none"> • Pests are natural • When people abandoned their fields 	Whole country	<ul style="list-style-type: none"> • Concoctions from traditional herbs • Weeding • Chemicals
Theft of livestock	<ul style="list-style-type: none"> • Laziness • Greediness • Selfishness • Stubbornness 	<ul style="list-style-type: none"> • From long time people no longer have love and respect for one another 	Whole Country	<ul style="list-style-type: none"> • Encourage everyone to get involved in farming

Group B presentation presented in Sesotho, their flip chart responses were written in Sesotho and translation was done into English. Group A presented in Sesotho, their flip chart text was in English and there was no need for translation into English.

3.4.2 Group a presentation of problems and solutions

Problem	Cause	Effect	Trends	Scale	Solution
Lack of Seed supply	<ul style="list-style-type: none"> • Limited seed production (there are only two seed producers in the country) • Import dependency 	<ul style="list-style-type: none"> • Late planting resulting in low yields 	<ul style="list-style-type: none"> • Declining as there are some initiatives in place to address the problem • Started since the introduction of hybrids seeds • Employment opportunities in mines made it easy for procurement of hybrid seeds • Due to retrenchment, farmers resort back to OPV's and depend heavily on 	<ul style="list-style-type: none"> • National 	<ul style="list-style-type: none"> • Training on seed production should be held • Follow up on seed policy

			Government donations		
Drought	<ul style="list-style-type: none"> • It is caused by Climate change 	<ul style="list-style-type: none"> • Field operations become difficult • Survival becomes severely low 	<ul style="list-style-type: none"> • From 1980-1989 – It was minor problem • 1990-2000 – that's when the changes began • 2000-2008 – a lot of droughts were experienced 	<ul style="list-style-type: none"> • Big problem in southern part of the country 	<ul style="list-style-type: none"> • Water Harvesting • Conservation of wetlands • Application of appropriate soil improvement techniques
Theft of livestock	<ul style="list-style-type: none"> • Jealousy • Laziness which leads to poverty 	<ul style="list-style-type: none"> • Low yield • Abandonment of fields due to theft 	<ul style="list-style-type: none"> • 1980-1989 – The rate of theft was low • 1990 – 2000- The rate of theft increase • 2000- 2008 – The situation became worse 	<ul style="list-style-type: none"> • Out of hand 	<ul style="list-style-type: none"> • To create an awareness concerning community policing

3.5 Examination of two of the proposed solutions

At the end of the second presentation the facilitator pointed out that the solutions that were developed should be ones that the participants were willing and able to take part in implementing. The exercise was not academic but meant to address real problems that they were facing. He also pointed out that there should be something new and different about the proposed solution. He then suggested that participants choose one solution from each group and discuss it as a way of strengthening it.

3.5.1 Examining solution to “Lack of government and NGO support”

The following discussion was held in Sesotho and translated into English during the session.

Participant (ext. officer): *It is not farmers who can force or influence NGOs to work with government. NGOs should align their mission with that of government. NGOs should realise that their interventions are short-term. Government should train NGOs.*

Researcher: *How would this address the problem of lack of support for farmers?*

Participant (farmer): *If these two can work together then the farmer will get better support. Now for example, you can have some farmers in a village supported by NGOs while others get support from government. When the NGOs project ends and it leaves, the government cannot take over or help the farmers who were working with the NGOs because they do not know or understand what was going on.*

Participant (farmer): *If these two work together, what would happen when directives are given by government?*

Participant (farmer): *In that case, the NGO person would stay with the people and the civil servant goes away to another area or to do another assignment following the government directive.*

Researcher: *What else can be done to address the problem?*

Participant (farmer): *Who exactly are these government people going to train?*

Participant (farmer): *They can train the NGOs on how to work with farmers, on approaches because we should not confuse farmers by coming with different farming methods.*

Researcher: *Who should decide on which approaches to use in working with farmers and what methods of farming to promote?*

Participant (extension worker): *The government and NGOs must come together and decide on which approaches and methods to adopt.*

3.5.2 Examination to Group A's solution to 'theft of livestock'

It progressed thus:

Participant (farmer): *Community policing is okay but if anything happens such as the death or injury of a stock thief, the community member responsible is on his own.*

Researcher: *So what should be done about this aspect of the problem?*

Participant (extension worker): *Lobby for a law that protects cattle keepers who implement community policies.*

Participant (extension worker): *People who provide such services in the community should be treated as police and therefore get the same level of protection by law.*

Participant (farmer): *We have already made that proposal before and it was rejected. The police made it clear that they are the law enforcers and if there is a problem then we should call them.*

Participant (extension worker): *Do community members who implement the policy have radios for immediate and direct communication with the police?*

Participant (farmer): *They do not have radios but radios would not solve the problem because the people who steal our livestock are among us and they know our plans, which mean they would know even when we have called police.*

Participant (farmer): *What we have realised is that when we conduct policing activities, the problem of stock theft stops and it only begins when we stop. And on the re-bounce, it gets even worse.*

Participant (MFS facilitator): *What happens out there in the fields away from the homesteads? Does the community policing cover those areas?*

Participant (farmer): *Yes it covers the rangelands too.*

Researcher: *Then it appears you already have the solution to the problem of theft, which is to make sure that you continue to implement community policing.*

Participant (extension worker): *You can also use traditional doctors to protect your livestock from theft.*

Participant (farmer): *How much does one have to pay?*

Participant (extension worker): *Five thousand maloti per year (laughter).*

Researcher: *Does this really work?*

Participants (extension worker and some farmers): *Yes.*

When the facilitator asked if they could examine a third problem, participants said that they had had enough. The facilitator encouraged them to re-think some of the solutions they had developed in view of the need to make them possible to implement as well as holistic in addressing the selected problem.

3.6 Planning the way forward

The facilitator asked participants what they would do about the problems they had identified and some of the solutions they had developed as well as about the other things they had learnt during the workshop. The following responses were made:

- a. **Farmers:** We will give feedback to our groups and make a plan to implement some of the solutions we generated. We will include the chiefs because it affects them. We will include the Department of Agriculture, especially the resource centres.
- b. **Government extension officers:** We will mobilise farmers and share solutions we have developed.
- c. **NGO:** We will proceed with the establishment of MFS demonstration fields at resource centres as a way of working with government and spreading the MFS.
- d. **Researchers:** We will work with the data from the workshop and the pre-workshop research study and come back to share emerging matters from the study in August 2009.

3.7 Workshop evaluation

Participants were asked to individually evaluate the workshop by answering the following questions:

- a. What did you find useful?
- b. What did you not find useful?
- c. What other comments do you have?

Participants' evaluation comments, which were written in Sesotho, were translated into English and put in the table below.

WHAT DID YOU FIND USEFUL	WHAT DID YOU FIND NOT USEFUL	WHAT ARE YOUR COMMENTS
Knowledge about Machobane and ways to increase its yield. Innovations by practicing farmers that helps to increase the	Nothing	Trainers must give us more knowledge about the system next time when we meet in workshop like this one

yield than the first system.		
Ways of finding solution to a problem of weakness that exist between Government and NGO's.	Nothing	Is there anything that the researchers going to do with the information got from Basotho people?
Ways of finding solution to seed problem and some difficulties found in this system		We need to work with the Government to spread Machobane system
Some effect that could be brought by what we thought could be the solution to a problem	Everything is useful and it is like a refresher course to us	Training like this shouldn't take long time to happen again. And I would suggest that they be held in every three months to refresh our minds about this useful information
I have learned ways of controlling pest such as weevil on beans. I also learned that NGO's do not plan together with the Government	Everything said here was supposed to have been discussed. So there is nothing wrong	I would suggest that whenever there is this kind of training every sector should be represented e.g. Ministry, NGO's, Chiefs as well as farmers who practice different farming systems
I found workshop helpful and refreshing		I thank you so much to have taken part in this workshop
To learn some ways of techniques involved in Machobane farming system	Everything/information I have learned was useful	Next time we have a Machobane system workshop we would like to have at least some leaflets or booklets explaining the technique in depth
Everything is useful (more especially to those who practice the system)		I think it would be good if I was trained on the system before I come to the workshop, that is why it's difficult on my side to say (a way forward) or to answer that question How can I be trained with Mohale's Hoek farmers if I don't have farmers in Mafeteng
What I have seen is that we will find solution that will help in continuity of this system and our trainers should work with the Ministry		
We have gained advices and strengthened on Machobane system and also recommendation that NGO's and the Ministry should work together to help farmers.	Nothing	The most important thing is to share knowledge and information with farmers

3.8 Closing remarks

The facilitator thanked the participant for their time; their efforts and insights shared during the workshop and indicated that they (the researcher and assistant) were hopeful that some positive actions and changes will come out of the process. He then handed over to the host

representative who also expressed his pleasure at the way things had turned out and at the quality of discussions. He then invited the senior agricultural extension officer to say a few words. She said that she was pleased to have been part of the process and hoped that this kind of talking to each other on the Machobane Farming System would continue between government, NGOs and farmers.

3.9 Some comments on the workshop

- a. The workshop evaluation suggests that the participants appreciate the expansive learning models and are likely to use it in their work places;
- b. The evaluation also suggests that participants learnt some specific aspects of the MFS. This was especially the case for government extension workers who have in the past not been involved in such workshops; and
- c. The evaluation also suggested that participants had become more aware of the lack of cooperation between government and NGOs in the agricultural sector and that they were keen to build bridges between the two so that they could send considered and non-conflicting messages.
- d. The use of the local language in the workshop was enabling in the sense that it made participation easy for farmers and the strategy worked. The downside was that it then required more time to translate from one language to another. The translation was only necessary during the plenary session though. This means that the time that was needed for translation would not be double, but less than double the time necessary if the workshop was held in one language. In future this additional time dimension needs to be factored in for workshops involving translation.
- e. Another challenge that was created by the need for operating in two languages was that during group work, the researchers, who both did not speak the local language, were not able to guide adequate additional guidance. In future it would also be important to have regular translations made to the facilitators/researchers during group work. This means that there ought to be more than one translator.
- f. The workshop took a total of about 12 hours including working teas. In the 12 hours there divided into the following stages: Orientation to the workshop; History of the MFS according to 3 groups of participants; Problem identification and prioritisation; Problem analysis and solution development; Sharing and critiquing problem analysis and solution development; and Planning the way forward. Six hours of continuous thinking on the second day proved to be a challenge as indicated by most participants when they were asked if they could examine a third problem. The lesson is that the quality of input may fall with time if the sessions are too long. It would appear that four hours per day would suffice. This raises the need to spread such workshops over a number of days and two days seem to be too short, even if the hours per day are increased.
- g. It was also worth noting that the participants had mechanisms for dealing with problems and that they did not need to form a committee to do that. Each stakeholder group: two registered local (district) farmer groups; district extension officers; and the MFS promoters decided to take their planned solutions to their respective constituencies for possible implementation.

4.7 FEEDBACK SESSION

4.7.1 Transcript of feedback workshop

Feedback workshop on MFS conducted in Mafeteng (2 November 2009)

(It was attended by five MFS farmers from two districts of Mafeteng and Mohale's Hoek and two MFS promoters from two organisations and lasted about 2.5 hours – which included some group work and translation. The numbering started from 800 to distinguish the conversations in the other two case studies)

800. The study visit has not been conducted, but it will be soon.

801. The Ministry seems to be reluctant to meet the MFS farmers. The farmers brought a request to the Ministry, even though the answer hasn't been given yet.

802. OK.

803. After the first workshop, more farmers seemed to be interested in MFS.

804. Can I ask a question?

805. Yes.

806. When did you write the letter to the Ministry, and what did the letter say?

807: Last month

808: October, or September

809: October.

810: October, OK.

811: Actually we wrote a letter in October, asking the government for support for MFS farmers so that they can get support to increase their production.

812: So when you say the government who exactly do you write to?

813: District Agriculture and Extension Office.

814: OK, have you been to see her in person?

814: No.

815: And are you planning to do that?

816: We are planning to visit her so that we can have a discussion.

817: OK. And when you went to report to the group, what, did you hold a meeting? How did you report the workshop, and what was the response of the other farmers back home in your group?

818: It was sort of a farmers' meeting. It didn't involve the Chief. We only involved the MFS farmers. And we gave them the feedback of the workshop, how the workshop went. And more seem to be interested. We had a few joining.

819: OK, how many?

820: We already have four farmers. But there are more who are interested. Maybe they soon will join.

821: OK. Thank you very much Ntate. Do other people have questions or comments? Yes Me'.

822: These people who are interested to join us, they are saying the MFS is labour intensive. But we are trying to show them all the options, and showing the benefits, instead of the hard work ... so that if you work hard even the body become light. So it is not only the hard work,

but you are doing good for your body too, so that you can support even the household [family].

823: OK, thanks any other comments? OK, you can clap your hands for Ntate and his group.

824: Okay Me was asking is the farmers from Mohale's Hoek visited farmers from Mafeteng and they are saying the answer will appear in the next presentation.

825: OK. But I think it is a good question in the sense that she would like to know why they didn't visit.

826: Ntate is saying that they are not only involved in MFS, they are also involved in conservation agriculture and weeding so the work that they have didn't allow, give them space to have a visit to the other group.

827: OK, alright, they were too busy?

828: They were too busy.

829: OK, alright. Thank you very much. Can you clap your hands for this group? OK, thank you very much. Can we go on to the next group that is ready to present [all clap hands for the group].

830: Me' said our expectations as farmers is that we are expecting the Ministry to help us with seeds so that we can improve our production with the aim of helping our families, the orphans, even the vulnerable children. Yaa, that's the expectation.

831: Me' is saying we as farmers from Mohale's Hoek, we haven't really visited the Mafeteng group. So we are still using the system that's been introduced to us. But our hope is that we will end up visiting so that we can share ideas and then get a sharing of ideas of how to improve the system.

832: OK

834: After the workshop, we managed to recruit some of the farmers, while some of them have fear of the work. We did recruit some, but some fear the labour intensiveness of the system.

835: OK. Thanks Me'. There was an issue about seed security, the seed policy not being supportive of farmers, and there were promises that something was going to be done about it. Did you do anything about it?

836: Yeah, I will answer that from my perspective. The seed policy, it, there was a meeting where it was discussed, but it was discussed in a way that it should be improved before it can be taken to the parliament for approval.

837: Who attended the meeting, and who convened it?

838: There were some representatives from farmers, representatives from NGOs, the Ministry of Agriculture and other ministries.

839: Who invited people to attend?

840: Actually, it was in the hands of the Department of Research, through the support from FAO. So FAO is interested in the seed policy. So the policy document has been compiled, has been discussed and some recommendations made. So it will be tabled in parliament.

841: Was there representation from MADF and RSDA?

842: Yes, I was there, Me' MT was there.

843: And did any of the farmers here attend the meeting?

844: No.

845: OK. So when did you get the farmers from, the ones who attended the meeting?

846: Actually, the FAO and the Department of Agricultural research decided to have a project in Northern Lesotho, on seed multiplication [where conditions for seed production are better]. So, most of the farmers were drawn from there. They [the Department and FAO] were complaining that the southern part is drier so it needs some irrigation facilities for seed production to happen, of which it would be much expensive. But northern side is much better,

soils are good, the rains are good, so the chances of having good seed are much higher than the chances in the southern Lesotho. And we were complaining that we know for sure that they can produce seed in the northern side but those seeds must be tested in the southern districts in conditions that we are facing here. Because if they produce seed in the northern it would be impossible for us to buy those seeds if we don't even know whether they will do well in the southern... So that is the work that the Ministry of preoccupied with at the moment, throughout the country, giving people vouchers to buy seed. They are targeting about 36,000 farmers around the country.

847: Which seed are they selling? Is it from seed companies or farmers?

848: Actually, every seed seller can tender and the ones who qualify get selected.

849: Are there any from the farmers that you work with? Are there any seed that are being sold from MFS farmers?

850: No, actually, they tend to select the big seed sellers.

851: The farmers are saying they did benefit from the FAO supported initiative.

852: Ok, How did they benefit?

853: Each farmer received 800 maloti worth voucher so that they buy seed from the seed companies around.

854: So what kind of seed did they buy?

855: Maize, potatoes, cabbage and beans. A 25 kg bag of potato seed cost 300 maloti. So you can realise how much money these seed companies are making.

856: It is helping them to get seed, but it is not building their ability to produce seed for themselves?

857: Actually, it is kind of an emergency. It relieves you while you are still preparing for the mid-term because at the moment it has an emergency component to relieve you from the hunger while still preparing you to engage in the long term.

858: OK. That's good.

859: Especially because the seed that is recommended in those seed fares are open pollinated varieties.

860: OK, that is good?

861: Our intervention in this regard could be to train them on how to select seeds from their harvest so that they can be able to multiply.

862: OK, thanks very much. Can we clap hands for the group? [All clap hands].

863: Now can we have your group?

864: The challenges encountered are that there is limited funding/resources to support MFS. There is no linkages between organizations that are involved in promoting MFS e.g. RSDA, MADF. There is minimal documentation on the successes of the MFS. There is lack of interest from Government on MFS. However there has also been some progress. There has been an initiative on the establishment of good relations with the Ministry of Agriculture and Food Security (MAFS) through the office of the District Agriculture Office (DAO). Out of this initiative we established a demonstration plot for documenting MFS as good practice. Can I elaborate?

865: On the progress made?

866: Yeah, about the progress. Actually like I have indicated that we have established good relationship with the DAO, in that the DAO's office is supporting us on the establishment of the demonstration, of which they are giving us seed. They are giving money for ploughing, even for weeding; all the moneys that are needed are from the office of the DAO. Our aspect is to, just technical knowledge of the systems. So through having that demonstration we will be able to document the evidence of how the system works, so that we can have something documented. Because we know the system works, but there is nowhere you can find a written

document saying this is how it works. So we are aiming to get to that point. We have got good relations with the Ministry. Also from that demonstration we will be able to raise awareness like we are doing among the councillors. Because whatever the plans come from the council, they are to take up to district of which every sector, of every department is expected to fulfil, or to support those plans, which are coming from the grassroots. So if we create awareness among the grassroots, among the people who are making plans, we will be able to have our MFS into their plans, of which the Ministry will be bound to support. So that is the angle we are taking.

867: Have you had any awareness raising meetings with councillors or is that something you are planning to do?

868: Actually, we haven't called the meeting as such, but in whatever operation that's been done in demonstration, the councillors and the chiefs are taking part. So, even some farmer representatives are taking part.

869: Let us hear a bit on how you came to secure that plot from the District Agricultural Office.

870: Actually we made a request. Because we have a project document on supporting southern district called Sustainable Agriculture Resource Management Programme. So in that programme was being supported by IFAD. So within the project document, there was the element of MFS, of which the Ministry is not implementing that section. So when going through the document, we realised that the MFS is not being done. So we approached the ministry on that regard, asking the Ministry that is possible to partner this on issue so that we can put a demonstration plot in order to answer to this request within the project document. They delayed to answer, but we pursued that, now and then until they asked us to write a concept paper on that and submit to the Ministry. We did that and then we did the budget. And they said fine, you see that you have a work to do. Here is the budget. But we are not going to give you money. Instead, whatever is required you get it from the Ministry. But for labour, they gave us a bit of the money, so that we don't delay the operations. And then we identified someone to plough the field that person will have an invoice I will submit and they will pay that person.

871: Is that plot anywhere nearby? Can we pass through the demonstration plot?

872: That's the one I was showing you on our way to this meeting.

873: That's the one. OK. Did you actually hold any meetings with the DAOs or the DAOs office?

874: Yes, actually we visited the DAOs office. We met with him; we met with the Sustainable Agriculture and Natural Resources Management Co-ordinator here. We met with the District Crops Protection Officer

875: OK. Did any of the extension Officers who were present at the last CL workshop take part in those meetings?

876: Those who were present last time were the ones that we are working with even that lady, the one who came late, is the Crop Protection officer, of which we were expecting them today. But seems we missed them because of the seed fares.

877: OK, alright. Thanks very much, any questions or comments?

878: Me' is saying that some of the farmers have indicated that they received seed through the seed fares. And she wants to know about the quality of the seed they received, whether they will be able to have seeds from the harvest. Did they get a good harvest?

879: Ntate is saying they are doing well. His potatoes are flowering, some are still germinating.

880: Thank you. Yes Me'.

881: Me' is saying she did benefit from seed fares. She got some maize, but did not get seed from potatoes. She is not sure whether she will select seed from the maize crop. So that training in seed selection is very important.

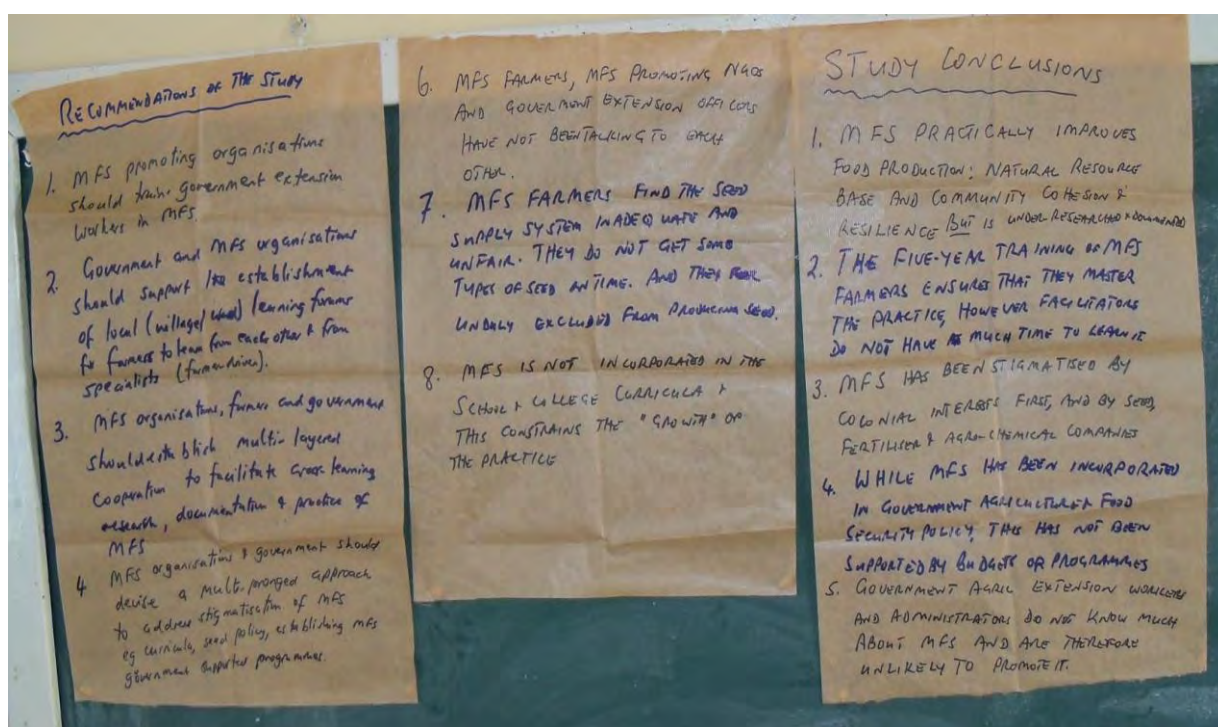
882: Me' is asking if they know the names of the seed they received because some of them may not be good for seed multiplication.

883: They are saying those were good seed. They were open pollinated varieties.

884: OK, thanks very much. I am quite impressed by the good relations between RSDA and the DAO office here. I am wondering why the DAO office is not responding to the request that was made by the farmers. Are you, did you know about the request and what role do you plan to play in order to help?

885: I did not know about the request but it is easy to follow it up and find out how far it has gone.

886: Thanks very much. Can we clap hands for the group? [All clap hands]. Now I am going to give you feedback on what I found out in the research. There are eight conclusions and four recommendations (See below).



887: [after the presentation or recommendations] Ntate is just saying he realises that you came with good recommendations, especially on stigmatisation of MFS especially within the government. If that could be addressed, then things will be right.

888: OK, thank you.

889: Me' is saying it has been a request from farmers that RSDA and MADF should work together. But it doesn't seem so. And she is saying if the top officers are not working together even if we want to collaborate, it would be difficult because the top officials are not taking that into consideration.

890: I think that's a very important point because it was raised at the beginning of the interview process. But then we have been hoping all along that you have been working together. When you went there [MADF offices], I was impressed that there is compost being

made and sold, but the RSDA people also didn't know about that. So I think you are right that there is need for collaboration.

891: Me' is actually emphasizing on the importance of collaboration between the two top officers. She has realised that the gap was small at the beginning but as time went by she realised that there's a gap that is between the two offices was growing, until now that there is a huge gap, of which she doesn't even know how to close that gap. It seems there's a donga in between the two offices, which needs to be closed so that we can improve the MFS.

892: What do you think is the real problem?

893: There was misunderstanding between the two offices...

894: OK. Thanks very much, any other questions or comments?

895: I think I support the last idea [recommendation], the 4th one especially when it comes to establishing the programmes. But like here in Lesotho, you find most of our organisations are working on projects. And when the project goes, then everything goes. But the programme, if we manage to have programme it will be easier for us to have long term thing, of which we work on. Because I remember we had a Sustainable Land Use Management and under that programme we had different projects, of which MFS was being treated as a project. When the funds for that project ended, the project also ended. So there was no continuation of the project. So if I think, if it is expanded into a programme then even the five year training programme for MFS farmers, we will be able to achieve that. Because once the farmer goes beyond five years, he will be able to sustain itself in terms of implementing the system. But if you go for one, two, three years, then you drop him on the way that would be a disappointment to a person.

896: Okay thanks very much, if there are no further comments, I would like to say thank you very much not just for today but for the whole period of time that we have been talking to each other. I will be leaving tomorrow and I wish you all the best. Thank you very much.

897: We are sad.

898: You say you are going, who are you going to leave us with? Try to stay.

899: Yourselves. [Laughter] I hope there will be another time but this is the end of my study.

900: Ntate we also thank you because you the dead because through you we were able to meet the Foundation. So it was good from our side. It re-invigorated the spirit of the MFS in a way.

901: I think this brings us to the end. I will raise the issue about collaboration between the top officers when I meet them. Thank you.