LEARNING FOR CHANGE: YOUTH AND NICHE ENVIRONMENTS IN FOOD SYSTEM TRANSITIONS

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Declaration

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This dissertation includes 3 unpublished publications. The development and writing of the papers (published and unpublished) were the principal responsibility of myself and, for each of the cases where this is not the case, a declaration is included in the dissertation indicating the nature and extent of the contributions of co-authors.

Luke Metelerkamp

December 2018

To us.

The youth.

We need to tear down the barriers wisely, or else we won't be able to get out and nothing else will be able to come in.

- Ben Okri

With thanks,

A deep greatitude to the earth, the firm relationships and the long journies that sustained my enery through this process.

To those who helped me walk this path with lightness: your patience, humour and support have been invaluable. You know who you are ;)

To my supervisors, with your light touch and clear guidance, I could not have asked for better. Thank you.

And, most importantly, to all those who shared their stories and experiecnce. ndza Khensa, enkhosi, dankie, ngiyabonga. This is ultimately your story.

ABSTRACT

The global food system exists in a state of increasing dysfunction for both people and planet. The need for a deep systemic transition of the food system is increasingly apparent, as is the need for research into understanding how innovations can be fostered to support these transitions.

From an employment perspective, the rapid corporatisation of the food system has driven a major restructuring of work opportunities within agriculture and its associated value chains. Moving into the future, this agricultural restructuring will have major implications for Africa, where the working lives of the majority of the 800 million youth predicted enter the workforce by 2050 will be directly affected by the form the food system takes. Within the South African context, which is the focus of this study, 50 percent of youth are ensnared in a complex and intractable unemployment crisis that is being driven, in part, by a transition toward a highly corporatised food regime. This is particularly true for the formal agricultural sector which, despite being identified as a powerful engine for job creation, is amassing considerable profits while shedding jobs. Concurrently, in the informal sector, many youth are turning their backs on traditional subsistence and small-scale farming livelihoods in spite of high unemployment.

Against this backdrop, this study set out on a dual line of enquiry: One, to probe this paradoxical turn away from small-scale agriculture - trying to understand what a sustainable, employment intensive agricultural future would look like in the eyes of South African youth. The second, to understand where the new knowledge and competencies for such a system could come from, as well as how to improve youth access to this. In doing so, the research aimed to enable food system change by offering practical tools and insights to youth and other food systems actors seeking to transgress the systemic limitations of the current food regime.

The thesis is divided into three distinct but complementary journal articles that applied a mix of narrative and social network-based approaches. Literature on systemic transitions, food systems, youth employment and learning were drawn together to provide a theoretical grounding for these papers.

Paper One reports on a narrative based enquiry into youth attitudes and aspirations towards careers in agriculture. What emerged was that in spite of the intense social stigma attached to agricultural careers, around 30 percent of the 573 youth surveyed harbored positive attitudes towards careers in the sector. Encouragingly, many of these youth demonstrated a clear interest and passion for socially orientated micro-entrepreneurship in agriculture. However, in the current food system, the careers these youth aspired to were unattainable and the work available to them was seen as demeaning and unrewarding. In considering these youth aspirations, the research suggests that fertile ground exists for change in the food system. Transitioning to a socially and ecologically just food system, however, is a knowledge intensive undertaking. Currently, prospects for this transition are hamstrung by economic power imbalances, discordant food policy and a failing education system.

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Papers Two and Three suggest that achieving a transition towards a just and sustainable food system will require training that breaks current systemic lock-in and builds the skills needed to disrupt the current unsustainable trajectory of the food system. Due to the significant numbers of people in search of employment, and the shortage of trainers with the necessary transitional competencies, radical new models of capacity development are required. These models need to be able to amplify and transfer tiny (niche) pockets of place-based experience to very large audiences at low cost. To do this, new capacity building models will need to be able to operate both within the struggling formal training and extension sectors as well as beyond them in new formations.

These papers further demonstrate that the social networks within grassroots food system niches are under-recognised nurseries of socio-ecological innovation. These networks demonstrated a tenacious appetite for learning that played out in complete isolation from any formal training and extension institutions. In doing so, these networks displayed remarkable pedagogic sophistication while operating at very low cost - largely due to the culture of reciprocity in which they were grounded. The research also confirmed what other transition theorists have suggested: that competency for transitions in complex, socio-ecological systems is a network outcome and not an individual characteristic.

The unique contribution of this thesis to the broader debate around food system transitions and the role of youth is threefold. Firstly, presents youth narratives on agricultural careers that constitute a politically resonant youth mandate for food system transformation. Secondly, it provided new insights into how the informal and fragmented knowledge that is generated within sustainability niches can be wielded more effectively to support youth in acquiring the competencies they need to accelerate systemic change. Finally, it proposes a preliminary method for supporting educators, curriculum designers and social activists to harness the power of niche knowledge networks.

This thesis highlights that the needs and aspirations of youth present an opportunity for transformation in the food system. To achieve this, local civil society, alternative food retail cooperatives and aspirant farming communities will need to be equipped with new tools for amplifying latent and fragmented knowledge resources in their specific contexts. Niche networks will also need a ramping up of support and investment.

OPSOMMING

Die wêreldvoedselsisteem bestaan in 'n staat van toenemende disfunksionaliteit vir beide die mens en die planeet. Die noodsaak vir 'n ingrypende, sistemiese oorgang binne die voedselsisteem is toenemend duidelik; só ook die noodsaak vir navorsing wat lei tot 'n beter begrip van hoe innovering ter ondersteuning van hierdie oorgang aangemoedig kan word. Vanuit 'n werkskeppingsperspektief het die snel-gekorporatiseerde aard van die voedselsisteem 'n grootskaalse herstrukturering van werksgeleenthede binne die landbou en geassosieerde waardekettings gedryf. In die toekoms sal hierdie herstrukturering beduidende gevolge inhou vir Afrika, waar die vorm van die voedselsisteem 'n direkte uitwerking sal hê op die beroepslewens van die meerderheid van die 800 miljoen jeugdiges wat na beraming die werksmag teen 2050 sal betree. In Suid-Afrika, die fokus van hierdie studie, is 50 persent van die jeug vasgevang in 'n komplekse, onbeheerbare werkloosheidkrisis wat deels deur 'n oorgang tot 'n hoogs gekorporatiseerde voedselregime gedryf word. Dít is veral waar van die formele landbousektor wat, ten spyte daarvan dat dit geïdentifiseer word as 'n kragtige dryfveer vir werkskepping, aansienlike winste vergaar terwyl dit poste verminder. Tegelykteryd, in die informele sektor, draai vele jeudiges hulle rûe op tradisionele bestaans- en kleinskaalboerdery ten spyte van grootskaalse werkloosheid.

Teen bogenoemde agtergrond het hierdie studie twee navorsingsdoelwitte voor oë gehad. Die eerste was om ondersoek in te stel na hierdie paradoksale wegdraai van kleinskaallandbou en terselftertyd te poog om te verstaan hóé 'n volhoubare, werkskeppingsintensiewe landboutoekoms kan lyk deur die oë van die Suid-Afrikaanse jeug. Die tweede doelwit van die studie was om te verstaan waar die nuwe kennis en vaardighede vir só 'n sisteem vandaan kan kom, en hoe jeugtoegang daartoe verbeter kan word. Sodoende het die navorsing gepoog om voedselsisteemverandering te vermag deur praktiese hulpmiddels en insigte te bied aan die jeug en ander voedselsisteemrolspelers wat die sistemiese beperkings van die huidige voedselregime wil oorkom.

Die proefskrif is verdeel in drie aparte dog komplimentêre joernaalartikels wat 'n mengsel van narratief- en sosialenetwerk-gebaseerde benaderings ingespan het. Literatuur aangaande sistemiese oorgang, voedselsisteme, jeug-indiensneming en leer is verweef om 'n teoretiese grondslag vir hierdie artikels te bied.

Artikel Een lewer verslag oor 'n narratief-gebaseerde ondersoek onder die jeug na houdings teenoor en aspirasies vir beroepe binne die landbou. Dit het vorendag gekom dat, ten spyte van die intense sosiale stigma rondom lanbouberoepe, rondom 30 persent van die 573 jeugdiges wat die opname voltooi het, positiewe houdings koester teenoor beroepe binne hierdie sektor. Dit is bemoedigend dat vele van hierdie jeugdiges 'n duidelike belangstelling in en passie vir sosiaal-geïntegreerde mikro-entrepeneurskap binne die landbou geopenbaar het. Binne die huidige voedselsisteem was die beroepe waarna hierdie jeugdiges gestrewe het egter nie haalbaar nie en is die werk tot hulle beskikking gesien as vernederend, onbevredigend en nie-lonend. Gegewe die voorafgenoemde jeug-aspirasies, toon hierdie navorsing dat daar vrugbare grond bestaan vir verandering binne die voedselsisteem. 'n Oorgang tot 'n sosiaal- en ekologies-regverdige voedselsisteem is egter 'n kennis-intensiewe onderneming. Tans word vooruitsigte vir hierdie oorgang gekniehalter deur ekonomiese wanbalans, 'n teenstrydige voedselbeleid en

'n mislukkende opvoedingsisteem.

Artikels Twee en Drie stel voor dat 'n oorgang tot 'n regverdige en volhoubare voedselsisteem opleiding sal vereis wat mense bevry van noodwendige deelname aan die huidige sisteem en die nodige vaardighede bou om die huidige onvolhoubare trajek van die voedselsisteem te ontwrig. Weens die beduidende getal werksoekers en die tekort aan opleiers met die nodige oorgangsvaardighede, is radikale nuwe kapasiteitsontwikkeling-modelle nodig. Hierdie modelle moet in staat wees daartoe om brokke gespesialiseerde, plekgebaseerde ervaring aan baie groot gehore oor te dra en te versterk teen minimale koste. Om dít te vermag sal nuwe kapasiteitsboumodelle moet kan funksioneer binne beide die sukkelende formele opleiding- en uitbreidingsektore en binne verdere, nuwe formasies.

Hierdie artikels toon verder dat die sosiale netwerke binne voetsoolvlak-voedselsisteemniches ongewaardeerde kweekhuise vir sosio-ekologiese innovering is. Hierdie netwerke het 'n onblusbare sug na kennis (buite die konteks van enige formele opleiding- en uitbreidinginstansies) gedemonstreer. Sodoende het hierdie netwerke merkwaardige pedagogiese gesofistikeerdheid getoon terwyl hulle teen baie lae koste gefunksioneer het, grootliks danksy die kultuur van wederkerigheid waarop hulle gegrond is. Die navorsing het ook bevestig wat ander oorgangsteoretici al voorgestel het, naamlik dat bevoegdheid vir oorgang in komplekse, sosio-ekologiese sisteme 'n netwerkuitkoms en nie 'n individuele eienskap is nie.

Die unieke bydrae van hierdie proefskrif tot die breër debat rondom voedselsisteemoorgang en die rol van die jeug daarin is drievoudig. Eerstens het dit jeugnarratiewe oor landbouberoepe wat 'n polities-resonante mandaat vir voedselsisteemtransformasie uitmaak, uitgelig. Tweedens het dit nuwe insigte gebied in hoe die informele en gefragmenteerde ervaring wat deur vohoubaarheidsniches gegenereer word, die jeug meer effektief kan ondersteun in hulle verwerwing van die nodige vaardighede om sistemiese verandering te bespoedig. Laastens stel die proefskrif 'n voorlopige metode voor vir die ondersteuning van opvoeders, kurrikulumontwerpers en sosiale aktiviste om die mag van niche kennisnetwerke te benuttig.

Hierdie proefskrif belig die feit dat die behoeftes en aspirasies van die jeug 'n geleentheid bied vir transformasie in die voedselsisteem. Om dít te bereik sal die plaaslike burgerlike samelewing, alternatiewe voedselhandel-koöperasies en aspirant boerderygemeenskappe toegerus moet word met nuwe hulpmiddels om latente en gefragmenteerde kennisbronne in hulle spesifieke kontekste te versterk. Ondersteuning vir en belegging in niche netwerke sal ook versterk moet word.

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LIST OF ABBREVIATIONS

AFS - Agri-food system

AET - Agricultural Education and Training Organisations

FAO – Food and Agriculture Organisation of the United Nations

ILO – International Labour Organisation

MLP - Multi-Level Perspective

NDP - National Development Plan of South Africa

NYP - National Youth Policy

SET - Socio-ecological Transformations

SNM - Strategic Niche Management

FET - Further Education and training

PGS - Participatory guarantee system

SAOSO - South African Organic Sector Organisation

KEY DEFINITIONS

Accumulation from below

> Accumulation from below refers to the process of broad-based accumulation of financial and social capital among the rural and urban poor and working class. In the context of agriculture, this specifically implies supporting the untapped potential of small scale farmers to expand their production of marketable surpluses in order to fill the gap between tiny food security gardens and huge commercial farms (Cousins 2007, 2011). Cousins refers to this as a process of agricultural development that 'delivers real improvements in the material conditions and livelihoods of the majority' (2011. P16).

Agroecology

> Agroecology is a science, a practice and a movement that combines elements of traditional farmers knowledge with elements of modern ecological, social and agronomic science. It aims to create a dialogue of wisdoms from which principles for designing and managing biodiverse and resilient farms (SOCLA 2015). It is grounded in the assumption that healthy ecosystems produce more resilient agricultural systems.

Food system

The food system, includes all activities, outcomes and drivers relating to the production, processing, distribution, consumption and disposal of food. This includes:

- the physical value chain by which food is produced, processed, distributed, consumed and disposed of
- the present and historical cultures, institutions and policies which shape these activities.
- the outcomes of these activities on the health and wellbeing of people and the planet
- the network of relationships between these elements

Food Sovereignty

The Nyéléni Declaration of 2007 defined food sovereignty as follows:

'Food sovereignty is 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 those who produce, distribute and consume food at the heart of food systems and policies rather than the demands of markets and corporations. It defends the interests and inclusion of the next generation. It offers a strategy to resist and dismantle the current corporate trade and food regime, and directions for food, farming, pastoral and fisheries systems determined by local producers. Food sovereignty prioritises local and national economies and markets and empowers peasant and family farmer-driven agriculture, artisanal fishing, pastoralist-led grazing, and food production, distribution and consumption based on environmental, social and economic sustainability.' (La Via Campesina, 2007)

Livelihood

A livelihood is a person's 'capabilities/capacities to generate and maintain their means of living, to enhance their well-being and still be able to withstand shocks and stresses'. (Chigunta, *et al.* 2005, p5)

Employment

A person (between 15 and 64) is considered to be employed if during the week before being surveyed they worked for a wage, salary or commission or ran any kind of business by themselves or with other people. They will be categorised as "employed" even if they only worked for an hour in that week (Wilkinson 2014; Stats SA 2018).

Underemployment

Persons in underemployment (time-related) are employed persons who were willing and available to work additional hours, whose total number of hours actually worked during the reference period were below 35 hours per week. (Stats SA 2018).

Unemployment

Unemployment is difficult to define and there is little agreement about how the unemployment problem should be measured, or defined (Byrne & Strobl 2001;

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Chigunta, *et al.* 2005).

In South African government follows a 'narrow' definition of unemployment. Someone (aged 15-65) is considered to be unemployed if they capable of working or starting a business but had not done so. In addition, they need to have actively looked for work or tried to start a business at some point in the four weeks preceding the survey.'

The ILO applies a similar definition to the one ascribed above. However, the ILO clearly state that *where labour absorption is inadequate to meet demand* the criterion of needing to have actively sought out work to qualify as unemployed should be 'relaxed' (ILO nd. P4). Given that South Africa has one of the highest official unemployment rates in the world (Bhorat and Khan 2018), labour absorption has clearly been inadequate to meet demand for generations. This suggests the need to liberally interpret the relaxation the work-seeking criterion. Or to do away with it completely as other emerging economies such as Peru and Malawi have done. The ILO also recommends that students and homemakers who would like to work but are not actively seeking work should be included (ILO nd.).

In conceptualising unemployment this thesis applies an expanded definition that takes into account the ILO's recommendations. It defines an unemployed person as: Someone between the ages of 15 and 65 who would like to work, in a full or part-time capacity, but who is without any form of livelihood.

Knowledge network

A network of individual actors and relationships which, collectively, provide knowledge on a particular field of practice. Actors within a knowledge network can be individuals, institutions, texts (written, visual, audio, etc) or platforms (Google, Youtube, Facebook, etc).

Niche

Niches are small pockets of 'radical innovation' (Geels 2014. P3) within which networks of actors support novelties (social, ecological or technological) on the basis of experimentation and shared visions (Geels 2012, Geels and Schot 2007).

Organic farming

According the International Federation of Organic Movements (IFOAM): 'Organic Agriculture is a production system that sustains the health of soils, ecosystems and people. It relies on ecological processes, biodiversity and cycles adapted to local conditions, rather than the use of inputs with adverse effects. Organic Agriculture combines tradition, innovation and science to benefit the shared environment and promote fair relationships and a good quality of life for all involved' (IFOAM 2005). While similar in many respects to agroecology, organic farming implies a stricter code of certifiable practices governing farm management and the use of synthetic inputs.

Small-scale farming

In South Africa, the concept of small scale or smallholder farmer is value laden (racially

and economically)(Cousins 2011). Notions of what constitute a small farm are completely dependant on ecological context (Kirsten & van Zyl. 1998). Taking the above into consideration, this thesis uses the term small-scale farming to mean:

Farming at a scale below the norms of mainstream commercial agriculture within a given context, with objective of producing for household consumption, financial income or a mix of both.

Success (for farmers)

Success for this group is defined by several authors as a state characterised by high levels of productivity and access to markets resulting in sufficient cash income for the farmer to enjoy a life free from poverty (Koranteng 2010).

Transition

To undergo, or cause, to undergo a process or a period of changing from one state or condition to another. Transitioning the food system systems toward sustainability involves changing the activities, drivers and outcomes of that system

Youth

The notion of youth as a transitional period between childhood and adulthood is a fluid and culturally nuanced concept. The official classification of youth in South Africa is anyone between the age of 14 and 35. The African Union abides by a similar definition, classifying youth as being between the ages of 15 -35. Given the geographic focus of this thesis, the South African definition is used. At times external research based on the African Union definition is also presented.

1. INTRODUCTION

1.1 PERSONAL CONTEXTUALISATION AND MOTIVATION

In spite of my position of economic and historical privilege, I am a South African youth.

As a white man, I was born on a smallholding in Zimbabwe to parents trying to farm sustainably and live communally - a dual rebellion against a conservative family and capitalist economics. Spending the first five years of my life in this environment, among the cows, chickens and bees, you could say my personal connection to the work of food system transitions began at birth.

My academic relationship to this topic, however, began much later. Having enrolled in a post-graduate diploma in sustainable development in South Africa with the intention of focusing on renewable energy, the seeds planted in my early life began to germinate, and my interest quickly shifted to the food system. My master's research in 2010 went on to explore agricultural innovation among commercial wheat farmers in South Africa. On submission of my thesis in December 2010, I left South Africa to work with Dharamitra, a rural development organisation in central India. This experience exposed me for the first time to the viability and productivity of small-scale family farming conducted on a national scale to feed over a billion people. Dharamitra was concerned with many of the unintended side effects of the Green Revolution and, in response, focused explicitly on farmer-led science and peer-to-peer learning. On returning home to South Africa, I took up a coordination role with the Sustainability Institute, a civil society organisation, with close ties to Stellenbosch University. Multiple return trips to India followed, traveling with groups of African students, researchers and policy makers, asking what we, as Africans, could learn from India's experiences with the Green Revolution. My time working at the Sustainability Institute was interspersed with visits in Cuba, Costa Rica, New Zealand and Bhutan. These are countries which have all, in their own ways, demonstrated that post-colonial farming systems based on ecologically sustainable, small-scale, family farming principles can offer dignified and equitable alternatives to neoliberal models of agricultural industrialisation.

These experiences were formative in shaping my view of the food system as well as my philosophy toward education. But it was my work heading up the Food Systems Centre at the Sustainability Institute, and in particular the struggles we (and others like us) faced in attempting to support youth enter into generative careers in localised food systems, that was the guiding motivation for embarking on this study.

As a young leader and educator working between academia and civil society, I believed I knew what was possible, as well as what our organisation needed to be teaching. Yet our team (and others around us) seemed to continually battle to find the relevant expertise and know-how to effectively meet these teaching targets. In short, despite being connected to one of the premier agricultural universities in the country (and one could argue on the continent), we found we lacked adequate understanding of and access to, the *practical transformative knowledge* our farming students required. We knew what we wanted to teach students to do, but battled to

successfully deliver on the outcomes we wanted to see in the students. Conversation and engagement with similar civil society organisations and other training institutions suggested we were not alone in our struggles.

A PhD seemed like a valuable opportunity to address this challenge.

Thus began the journey.

1.2 A WORD ON CONTEXT

South Africa's food system is asynchronous with the rest of Africa. The levels of agricultural industrialization, value chain consolidation (horizontally and vertically), and 'supermarketisation', while quite 'normal' in the context of many industrialized economies such as the EU, USA, Brazil and Australia, are relatively unique on the African continent (Reardon *et al.* 2003; Hall & Cousins 2018). This is changing, however. The push for the adoption of high-input farming practices, the proliferation of large international land grabs and the expansion of supermarket chains across East and Southern Africa all signal that many other African countries may follow South Africa's path (Weatherspoon & Reardon 2003; Metelerkamp 2014; Hall and Cousins 2018). In many instances, South African capital, South African agri-food companies as well as international companies with recently established regional headquarters in South Africa are leading this charge (Metelerkamp 2014; Hall & Cousins 2018).

South Africa is also further ahead of the curve in terms of the youth demographic curve, and while many other countries in the region have yet to experience the consequences of their baby booms, South Africa's baby boom has come and gone (UN DESA 2015).
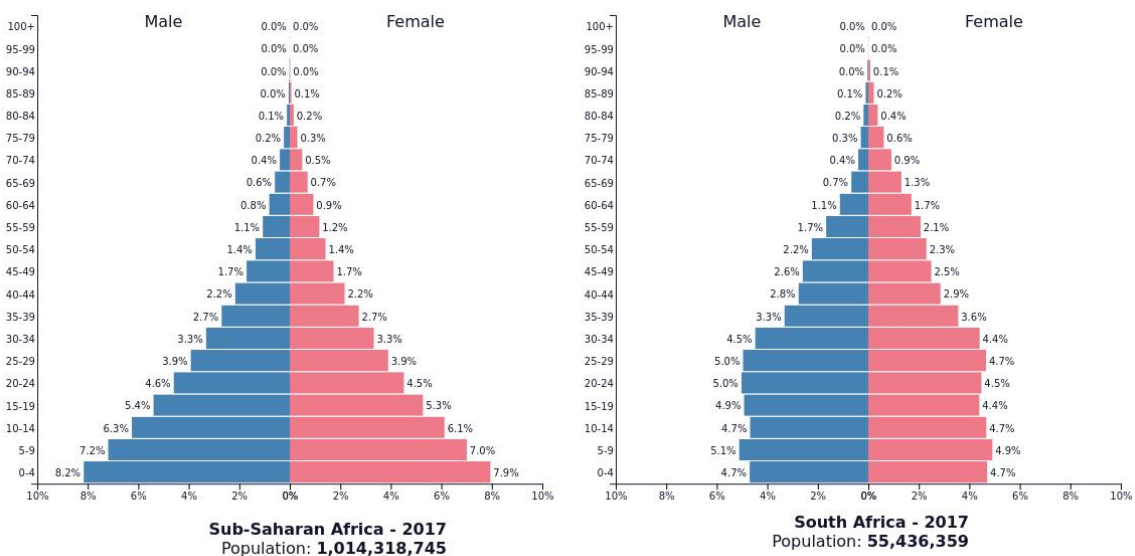
Figure 1: Population pyramid comparison between South and Sub-Saharan Africa (Source: UN DESA 2015).

When comparing urbanization rates, a similar transitional comparison emerges (UN DESA 2018). South Africa's unemployment rate is also an outlier: triple that of Sub-Saharan Africa at 26 percent and 7.2 percent respectively based on the narrow definition of unemployment (ILO 2017).

South Africa may therefore serve as something of a canary in the coalmine, providing early warnings to the rest of the region for some of the types of transitional challenges they could face in coming years.

Therefore, while this thesis is firmly rooted in the peculiarities of the South African context, the findings it presents may be relevant to other parts of Africa and beyond. Not simply as a comparison, but as a foresight tool. As such, much of the background framing for this research is presented at a regional level before zooming in on the South African context. Correspondingly, while the empirical data collection that this research undertook focuses on South Africa, references to the rest of the region are frequent throughout the text.

1.3 RESEARCH BACKGROUND

At present, 70% of Africans are under the age of 30 and between 2010 and 2050, an additional 800 million youth will enter the job market (Kaneene *et al.* 2015; Losch 2016*).* To place this in a global comparison, that is more than the current population of all of Europe combined (UN DESA 2018). Of these 800 million youth, it is unlikely that more than 50% will have completed secondary school or that more than 10% will have completed any form of tertiary qualification (Minde *et al.* 2015; Darvas *et al.* 2017). Correspondingly, persistent underemployment and unemployment have become synonyms with the youth experience across most of this region (ILO 2016; Fox *et al.* 2016). This is exemplified nowhere more so than in South Africa, where 50% of people under the age of 34 are unemployed and, of these, 60% have never been employed (Spaul 2013). The huge numbers of new entrants to the job market over the coming decades are likely to exacerbate the employment difficulties youth face.

Contrary to historical patterns, the majority of these young job seekers will live in urban environments, with UN projections suggesting that by 2050 more people will live in African cities than the entire population of Africa today (UN DESA 2018). The majority of these new African urbanites will live in informal settlements with the most vulnerable settling at the urban fringe (Swilling 2011), crafting livelihoods for themselves in the informal economy (ILO 2015). Many of these informal economy jobs will be in food preparation and retail (Greenberg 2015; Peterson *et al.* 2017; Battersby *et al.* 2017).

This rapid growth in the number of unemployed urban inhabitants emerging cheek-by-jowl with a growing African urban middle class has a powerful effect on the food systems across the region - now and in the future. The ecological and social pressures arising from changing dietary patterns, increasing globalisation and rising levels of social inequality will be far reaching in a multiplicity of ways (Steyn & Mchiza 2014). For example, with the increase in purchasing power and immersion into the types of food systems that typically accompany urban lifestyles, comes an increase in demand for resource-intensive foods such as meat, dairy, fish and processed

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foods (Godfray *et al*. 2010 *et al*. 2010; Joubert 2012; FAO 2012b; Tschirley *et al.* 2015); The biggest driver of terrestrial biodiversity loss internationally is agriculture (MIA 2015); Changes in land cover, largely for purposes of food production has also been a significant contributor to carbon emissions, accounting for 28-40% of total anthropogenic carbon emissions from 1850 to 2000 (Houghton 2010). From a marine perspective, the United Nations Food and Agricultural Organization (FAO) estimates that approximately 85% of the world's fish stocks are either overexploited or exploited to their maximum potential (FAO 2012a). This biodiversity and climate crisis combined with other socio-ecological challenges such as soil degradation (Lal 2006) are intricately linked to the youth question (Losch 2016). Collectively they all affect, and are affected by, the food system (Folke *et al.* 2002; Nellemann *et. al*. 2009; Holt-Gimenez & Patel 2009; Alkon & Agyeman 2011; Stuckler & Nestle 2012; FAO 2017).

However, the food system will not only be driven by these shifts, but as it changes, it will also play a defining role in driving change in both society and the environment. Some analyses suggest that agri-food sector's contribution to employment is as high as 80% for much of the continent (Tschirley *et al.* 2015) and hence, changes in the structure of the food system will have substantial impacts on youth unemployment and, to a lesser extent, the nature and pace of urbanisation. The total number of jobs specifically in agriculture are likely to stabilise across most of Africa and decline in South Africa (Tschirley *et al*. 2015). Between 2001 and 2016 the South African agricultural sector grew by 1.9 percent per annum while shedding jobs at a rate of 2 percent per annum. This equates to a loss of 286,101 jobs for that period (Bhorat & Khan 2018). In the face of this type of consolidation and mechanisation, far reaching reforms will be required if South Africa is to reverse this trend and transform the agricultural sector into an engine for job creation (SAIRR 2013; NPC 2012), poverty reduction and biosphere stability (Baronsky *et al.* 2012; IPCC 2014).

Increasing consolidation of national food value chains, both vertically and horizontally, acts as a contradictory force to the equitable distribution of power and profit within the food system (Holt-Gimenez & Patel 2009). In South Africa, despite growing revenue and a shrinking labour force, wage inequality in the agricultural sector rose by 43 percent between 1995 and 2014 (Bhorat & Khan 2018). Job shedding and the concentration of power across the South African food system is likely to perpetuate further undesirable trends in youth unemployment, income inequality and violence (Joubert 2012; SAIRR 2013; Pinnock 2016). The adverse socio-political implications of youth unemployment and rising socioeconomic inequality are well-documented and present an increasingly critical space for engagement.

In connecting these trends to a coherent representation of the food system, an extensive body of literature characterizing the current 'food regime' has emerged since Freidmann & McMichael introduced this term in 1987 (Freidmann 1993; Reardon *et. al.* 2003; McMichales 2009; Holt-Giminesz & Shattuck, 2011; Bernstein 2016). Broadly, these texts describe the current dominant food regime as a 'Global Corporate Food Regime' (McMichales 2009, p142), characterized by the large-scale commercialization of agriculture with increasingly high levels of commodity specialization, consolidated global supply chains and widespread 'supermarketisation' of the retail sector (Reardon *et al* 2003). In contrast to other regimes the corporate food regime, they argue, has risen to the fore as a result of an increasingly neo-liberal and geo-political landscape, supported by cheap fossil fuels and ecological exploitation.

The tension emerging between the prevailing food regime and a growing collection of food system niches pursuing different models of development, centred around themes of localization, food sovereignty and agroecology has been highlighted (McMichaels 2009; Holt-Giminez & Shattuck, 2011). These small pockets of innovation exist largely in opposition to the increasingly industrialised global corporate food system. Generally, they assert the benefits of ecologically produced food distributed through shorter value chains in which producers and consumers have a democratic voice in shaping the system. In addition, there are also aims to decrease the aggregation of wealth by a few large powerful corporate actors, to result in a more equitable distribution of benefits and agency.

Important to the Southern African region is McMichael's (2009) observation that while the supermarket revolution within the current food regime has led to a proliferation of choice for some, it has also contributed to generating populations of slum-dwellers as rural inhabitants are pushed out of roles in agrarian economies. This is a phenomenon Du Toit refers to in the South African context as jobless deagrarianization (Du Toit 2015), wherein consolidation of farmland and job losses in the rural economy pushes the rural poor into urban centres. Increasingly, even believers in neo-liberal political development like the World Bank are admitting that corporate-led land investments in Africa are not fulfilling their promise of employment creation for local people (White 2012).

In considering responses, three ideological counter narratives to the neo-liberal corporatization of the food system are important to consider. These are accumulation from below (covered in detail in section 2.2.4), agroecology, and food sovereignty.

Agroecology forms the material basis of production which, as the name suggests, places ecological principles at the centre of designing ecologically sustainable farming systems (Altieri 2009). Agroecology is a science, practice and movement that combines elements of traditional farmers knowledge with elements of modern ecological, social and agronomic science into the design and management of biodiverse and resilient farms (SOCLA 2015). It is grounded in the assumption that healthy ecosystems produce more resilient agricultural systems.

Food sovereignty is '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' (La Via Campesina 2007).

Accumulation from below refers to the process of broad-based accumulation of financial and social capital among the rural and urban poor and working class (Neocosmos 1993).

In reflecting on the ideological positions of these narratives, important differences emerge. Agroecology provides a somewhat socio-economic or class-neutral lens onto the biophysical process of growing food. Some tensions do, however, exist between food sovereignty and accumulation from below. While both food sovereignty and accumulation from below are avidly pro-poor, their understanding of how agrarian reform plays out over time differs. Accumulation from below acknowledges the emergence of differentiated class structures - even within those presently marginalised - as well as the intrinsic contradiction in commodity relations and markets. Proponents of food sovereignty, on the other hand, retain a much stronger, yet implicit, assumption in the potential of a unified alternative to large-scale capital. To put if differently, the former sees small and medium-scale farmers as highly differentiated by class,

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despite their current marginalization from the broader system, while the latter sees both groups as virtuous bearers of a systemic alternative to large-scale capital.

Environmentally, these are important differences too. Accumulation from below regards ecological sustainability as a somewhat negotiable necessity for agrarian prosperity, while food sovereignty places the environment and concern for future generations as foundational pillars of their movement.

Considered collectively, these movements constitute a set of overlapping principles, which, although with internal tensions, comprise an overarching framework for considering the who, the what, the how and the why of a food system transition. Taken together, notions of food sovereignty, agroecology and accumulation from below represent a pro-poor approach that embraces the environmental basis of food systems.

While Marxist theory on accumulation from below tackles social inequality head-on, it remains relatively silent on questions of nature and ecology. Agroecology, and to a lesser extent food sovereignty, emphasise the ecological aspects of the transition, highlighting the need to ensure that production practices underpinning social changes in agrarian reform are ecologically sustainable.

They all take a long-term view on jobs and livelihoods, recognising the need to address widening economic inequalities through the pursuit of deep reforms to the structures of ownership and agrarian capital accumulation. Contrary to agricultural development strategies which promote centralised large-scale investments into rural economies in the anticipation that money and jobs will trickle down to the poor, these concepts motivate for incrementally supporting the accumulation of social and economic capital from below. Ideologically, they take imbalances in power and agency seriously (Holt-Giménez & Altieri 2013) and they assert the need to address social imbalances within the food system.

In order to do this, these counter narratives argue for a need to create spaces within which the power to determine the structure of the food system is held at the grassroots and democratically distributed at the local level (La Via Campesina 2007).

Several conceptual frameworks exist for thinking about how this kind of a transition from the current food regime to a more sustainable one will take place. This thesis draws on the body of work on food regimes, socio-technical transitions and social-ecological transformations. Particular attention is given to the Multi-Level Perspective (MLP) framework, as the guiding theoretical framework for the kind of systemic transition this research seeks to address. Initially conceptualized as a heuristic framework for the study of ecosystems and socio-technical systems, the MLP is increasingly applied to the study of transitions within complex, large-scale, socio-ecological systems (Smith, Vos and Grin 2010). The MLP focuses on the ways in which small pockets of innovation (niches) at the micro level can disrupt and transform the mainstream trajectory of a particular dominant system (regime) at the macro-level in the context of wider changes taking place across a given system 'landscape'. The work on social-ecological transformations (Olsson *et al*. 2014), grows out of the broader body of work on social-ecological systems, resilience, and tipping points or regime shifts. It particularly emphasises the role of shadow networks and social entrepreneurs in driving change (Westley *et al.* 2013). These two frameworks both emphasise how experimentation and innovation at a micro-level can coalesce into wider movements capable of shifting entrenched regimes at micro

and macro levels. In doing so, a wider range of literature on social movements and socio-political change are brought into the framing of transition processes. Central to these conceptual frameworks (presented in more detail in Chapter 2.1) are questions about how individual and collective competencies for transformation develop.

In thinking about large-scale systems shifts, Carlsson and Stankiewicz (1991) highlight the need to consider the centrality of knowledge or the competence of different actors who can drive the transition. To briefly unpack the notions of knowledge and competence, competence defines the requirements for success in a given task or objective in more inclusive terms than speaking specifically about knowledge or skills (ACCME 2017). Spencer *et al*. (1994) define competence as: 'The simultaneous integration of knowledge, skills, and attitudes required for performance in a designated role and setting'. However, Goodyear and Carvalho (2013, p50) note that competence rarely resides in the head of an individual alone. Rather, 'a person's competence is usually entangled in, and dependent on, a set of social and physical relationships', which implies that 'an expansive view of competence includes [a] person's ability to assemble and hold together the entities needed for the task at hand.' The term competency, therefore, brings together knowledge, skills and an element of social capital, describing the practical application of these three factors in a particular physical and social context.

Acknowledging the interrelatedness of youth competencies and food system transitions, there has been a concerted call for increased investment and attention in youth skills development in the agri-food sector across the region (IFAD 2014; ReNAPRI 2014; NPC 2012; White 2012; Haggblad *et al.* 2015; Minde *et al.* 2015; Tschirley *et al.* 2015; Losch 2016; ASSAf 2017). If adequately considered and executed, this renewed investment represents a window of opportunity for mainstreaming emerging sustainability innovations into the food system in order to bring about change. Conversely, if poorly conceptualised, increased investment could further entrench the current food regime. This thesis focuses on informing such an investment in a way that supports and accelerates a sustainability transition in the southern African food system.

However, despite identifying the need for a structural transition within the food system, none of the literature advocating for change within the food system grapples with the critical question of young people's' interest in taking up the difficult work this will entail. After all, work is about far more than simply putting food on the table, it is central to the construction and expression of personal identity (Christiansen 1999). As White (2012), Swarts and Aliber (2013) and others (Krizinger 2002; Leavy & Smith 2010; Proctor & Lucchesi 2012; Cognac 2014; Leavy & Hossain 2014; Losch 2016) have highlighted, conventional opinion identifies a confounding situation in which youth are turning their backs on jobs in agriculture despite high-levels of unemployment across the continent but particularly in South Africa.

This tension between youth's apparent lack of interest in agriculture and the emphasis on youth and learning within food-system transitions brings us back to the question posed in the first paragraph of this introduction: In the context of a rapid expansion of youth in Africa, how do we think about engaging the 90% of youth who won't make it to tertiary training in transition processes?

1.4 PROBLEM STATEMENT

To consider it in the simplest terms, the food system is not working for most people or for the planet. At the same time, South Africa and much of the rest of the continent, faces an employment crisis. This affects young people disproportionately, limiting their ability to constructively engage in the collective act of transforming their societies as they enter their working lives. The fact that youth are disproportionately affected by unemployment will become increasingly problematic across South and Southern Africa as numbers of youth rise dramatically over the next 50 years.

As the primary source of livelihoods[1] in the region, the form the food system takes has a disproportionately large effect on the ways in which young people's' working and personal lives unfold. Yet because youth are the increasingly dominant demographic force in the region, their attitudes and behavior will also play an important role in shaping the food system.

However, in spite of their growing influence, very little is known about what youth actually think and feel about the food system, nor their roles in it. This dearth of empirical data programatically and politically undermines efforts to support and empower them. It may also enable development trajectories that exclude them.

Improvements in livelihood opportunities for youth, as well as changes in the broader structure of the food system are both clearly needed. However, because these two systems are so co-dependant on one-another, a transition in either of the two will be dependant to some extent, on a transition within the other.

Achieving change requires finding ways of supporting large numbers of youth to find or create livelihoods that contribute toward transformation of the food system., Given the extremely limited access youth have to formal tertiary training in the region, empowering youth to create transformative livelihood opportunities for themselves will require new approaches to skills development.

Given the breadth, depth and scale of the transitions in question, the institutions currently tasked with training youth in the region are inadequately prepared to solve this challenge alone. What is needed are new approaches capable of timeously incorporating grassroots sustainability innovation into approaches to skills development that are capable of reaching the 90 percent of youth who are excluded from formal tertiary training. The scale of skills development required also means that these new approaches will need to be affordable and not reliant on overburdened state institutions.

1.5 OVERARCHING AIM AND OBJECTIVES

The overarching aims of this study are, therefore, to enhance the understanding of youth perspectives on agricultural careers in South Africa as well as to better understand how and

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[1] When both formal and informal livelihoods are considered

where transformative food system knowledge is developing in that country. In doing so, the research aims to improve the relevance of agricultural skills development to youth and their role as leaders of food system transformation.

This can be considered from the perspective of three simple, but interdependent questions.
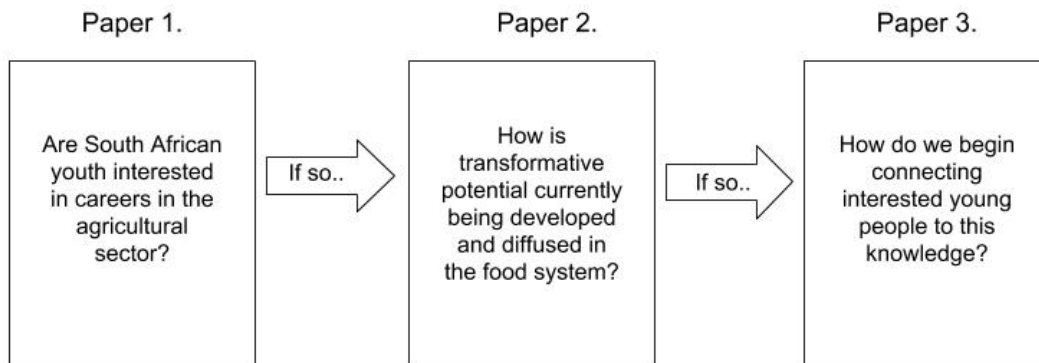
Figure 1.2: Questions and associated flow for 3 papers

The three papers presented in Chapters 3-5 address each of these sequentially.

In support of the aims of this thesis, the four main objectives of the study are to:

1. Investigate youth attitudes towards agricultural careers in South Africa (Chapter 3).
2. Interpret youth perspectives on agriculture in relation to agricultural careers to inform existing visions for what agricultural futures should look like (Chapter 3).
3. Contribute towards an improved understanding about who and where relevant knowledge for transformative change within the food system will come from (Chapter 4 and 5).
4. Contribute towards the development of practical approaches for connecting youth to this knowledge (Chapter 4 and 5).

These findings are aimed at a broad spectrum of practitioners, researchers and decision makers working with youth in South and Southern Africa; in particular, grassroots educational practitioners and those working with youth in the food system.

In addition to these practically orientated objectives, the research also sought to contribute to theory. From a theoretical perspective, the research aims to contribute toward theory formation around:

5. The dynamics of learning within sustainability niches in emerging economy contexts. Specifically, theory that considers how networks of actors engaging in collaborative innovation and learning at a niche level contribute to changes at the regime level (Chapters 4 and 5).
6. Conceptualizing community-based approaches toward sustainability education in Southern Africa (Chapters 3, 4 and 5).

1.6 OVERVIEW OF THESIS AND THREE RESEARCH PAPERS

In pursuit of these aims and objectives, this thesis is divided into three distinct but complementary journal articles, supported by a literature review.

These journal articles are presented in Chapters 3, 4 and 5. Due to the interdisciplinary nature of the research, the three journal articles are underpinned by a scan of the relevant literature and policy spanning the three papers. This literature review is presented in Chapter 2.

The objectives, motivations and methods for each of the three papers are outlined in detail in sections 16.1 - 1.6.4 directly below. Following this, section 1.7 provides an overview of the methodological approach that was used, while sections 1.8 and 1.9 cover the limitations and key definitions respectively.

1.6.1 PAPER 1

Title: *We're ready, the system's not – youth perspectives on agricultural careers in South Africa*

Motivation: Enabling a sustainability transition within the food system is a complex, structural project (Swilling 2011). Such a transition will partly require responding to the youth employment crisis by supporting youth to participate in food-system-based livelihoods that are socially just and environmentally sustainable. Given the complex relationship between youth unemployment, social inequality and structural shifts within the food system, there is a need to better understand how young people might be supported and inspired to actively participate in a transition towards a just food system. More specifically, in light of rising levels of youth unemployment in South Africa, now at 50%, there is a need to better understand the paradox of young people turning away from agricultural employment.

Objective: In recognition of the absence of empirical data on youth attitudes towards work in agriculture and the need to take youth perspectives seriously, the research seeks to understand young people's attitudes, experiences and expectations of work in the agricultural sector. This information is targeted at activists, educators and policy-makers interested in the role of the agricultural sector in addressing youth unemployment in South Africa and elsewhere in Africa.

Question: Are South African youth interested in careers in the agricultural sector?

Approach: The research took a narrative-based approach using SenseMaker as a tool for blended qualitative and quantitative data collection. A sample of 573 youth narratives were drawn from across three sites in the KwaZulu-Natal, Limpopo and Western Cape provinces of South Africa.

1.6.2 PAPER 2

Title: *Learning for transitions: A niche perspective*

Motivation: Roughly eight hundred million youth are projected to enter the African job market by 2050. Ninety percent (90%) of these will have no formal tertiary training. At face value this is a massive challenge. However, the existence of a young population who have not been boxed into specific ways of working by antiquated tertiary institutions also presents a window of opportunity for achieving change within the food system. Considering this situation from an educational perspective, two questions arise: in order to underpin sustainability transitions, where will the new skills and competencies come from; and, given the low levels of tertiary enrolment and the slow pace of change within academic institutions, how will youth access these new competencies?

Objective: To understand how successful sustainability pioneers learn and innovate outside of mainstream training institutions.

Question: How do successful agroecological farmers learn and innovate and do social networks play a role in this? If so, what can we learn from these networks?

Approach: This paper applies the Multi-Level Perspective as a heuristic for thinking about these questions and explores the role of emerging sustainability niches. It investigates the ways in which new skills and competencies are developed and disseminated within emerging niches. We used a network and power-mapping tool to investigate the learning taking place within an emerging sustainability niche in the South African food system. A series of 12 participatory mapping sessions was facilitated with a cross-section of successful agroecological farmers and related support organisations in South Africa. These sessions helped identify knowledge acquisition and learning strategies of successful food system pioneers. The network maps were presented to a group of local and international stakeholders for review and reflection.

1.6.3 PAPER 3

Title: *Net-Map: A frontline tool for supporting place-based learning in sustainability niches*

Motivation: Sustainability transitions are dependent on the development and diffusion of new skills and insights. However, in Sub-Saharan Africa, 90% of youth will enter the job market with no formal tertiary training. Within this context, there is a need to better understand how the valuable, experiential knowledge of sustainability pioneers can be more effectively used to accelerate wider systemic change.

Research Objective: This paper explores the potential utility of the Net-Map approach as a supportive tool in promoting learning for sustainability transitions. The paper builds on Paper 2, in which Net-Map was used to understand the learning networks of grass-roots sustainability pioneers. While the research findings have explicit value for agricultural training institutions operating at a grass-roots level in southern Africa, there are implicit links to formal training institutions, extension services and educational investors.

Question: Is Net-Map a useful methodological tool for supporting learning from niche knowledge networks?

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Approach: This utilised the series of 12 participatory mapping sessions which were run with a cross-section of successful agroecological farmers and related support organisations in South Africa. The data-set was interpreted from an educational perspective to identify knowledge acquisition and learning strategies of successful food system pioneers. Based on the findings this yielded, the authors reflected on ability of Net-Map to support learning in other contexts.

1.6.4 SUMMARY OF THREE RESEARCH ARTICLES

Table 1.1: Summary of research articles

Paper & Title	Question	Objective	Motivation
Paper 1: *We're ready, the system's not – youth perspectives on agricultural careers in South Africa*	Are South Africa youth interested in careers in the agricultural sector?	To understand youth attitudes and aspirations towards careers in agriculture so that they can be supported	To ensure that efforts to improve youth futures and engage them in food system transitions are informed by youth perspectives To support agricultural education and training institutions (AETs) in being responsive to the aspirations of their constituents To improve AET's ability to inspire, recruit and retain young people into new careers in the food system To support AET's ability to be responsive to the aspirations of their constituents To provide activists and policy-makers with empirical data to support calls for food system reform
Paper 2: *Learning for transitions: A niche perspective*	How do successful agroecological farmers learn and innovate and do social networks play a role in this? If so, what can we learn from these networks?	Better understand what kinds of jobs and skill sets more sustainable food systems of the future require youth to be competent in	To provide AETs and others working in the food system with new perspectives on how knowledge innovation takes place in emerging economy food systems

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		To better understand how transformative knowledge develops in emerging economy contexts	To support those promoting employment in the food system with a niche perspective on the kinds of transformative skills youth require to bring about change
Paper 3: *Net-Map: A frontline tool for supporting place-based learning in sustainability niches*	Is Net-Map a potentially useful methodological tool for supporting learning within and beyond niche knowledge networks?	To better understand how the experiential and often fragmented knowledge of niche pioneers can be more effectively brought to bear in accelerating wider systemic change	To support AETs and others accessing transformative knowledge that currently exists within niche spaces in the food system To provide an evaluative framework for directing funding and institutional support into niche environments.

1.7 RESEARCH APPROACH

This research positions itself in the broad, emerging field of sustainability science. In particular, socio-ecological systems thinking (Folke *at al.* 2010; Swilling & Annecke 2012; Cote & Nightingale 2012) and the study of innovation and systemic transition (Shove & Walker 2007; Geels 2010; Smith Vos & Grin 2010; Olsson *et al.* 2017).

 In order to meet the research objectives, an interdisciplinary approach was followed. This generated a blend of qualitative and quantitative data. While there were empirical components to the data collection and analysis in the individual papers, the overarching focus of the research was interpretative and qualitative (Labaree 2009). Denzin & Lincoln describe qualitative interpretative research as a process of bricolage, 'a pieced together set of representations that are fitted to the specifics of a complex situation' to present a solution that 'takes new forms as different tools, methods, and techniques of representation and interpretation are added to the puzzle' (2011, p4).

This kind of interdisciplinary, mixed-methods approach that yields blended data is recognised to be well suited to complex systemic problems (Swart *et al.* 2004; Teddlie & Tashakkori 2009;

Flood 2010). For this reason it has a history of successful application in the sustainability sciences (Frodeman *et al.* 2017).

The final questions that were covered in the three papers are the result of an iterative process of field-engagement and revision: An embedded process of mixing and matching, guided in part by the literature and in part by the tools of inquiry that were applied and the opportunities for further inquiry that these opened up.   The question and approach undertaken in Paper 1 sought, in part, to function as a process of engagement with youth in the food system in order to bring their voices and views into the framing of the research. As such, Paper 1 is deliberately broad and is intended to guide and inform the research questions in Paper 2. Similarly, the findings and questions generated from both Papers 1 and 2, are considered essential in the framing of Paper 3.

A separate literature review was conducted to underpin the three papers and support the integrative, interdisciplinary objectives of the research. This is presented in Chapter 2.

1.7.1 OVERARCHING RESEARCH METHODOLOGY

From a methodological perspective,two distinct research methods were employed.

Firstly, a narrative-based inquiry across three distinct regions in South Africa was undertaken to understand youth attitudes and aspirations towards agricultural careers. This contribution is presented in the first journal paper in Chapter 3.

This was followed by a more qualitative analysis of the knowledge networks underpinning a sustainability niche within the South African food system. The Net-Map method was used for this component of the research. Findings from the Net-Map process were divided into a second and third paper. These are presented in Chapters 4 and 5 respectively.

In considering the deployment of these methods, it is important to reiterate that my position as an actor within the communities of practice that the research focused on predated and informed this research. On entering the research process, I was a South African youth who had been involved in grassroots education in the South African food system for eight years. Like the youths that the research sought to support, I was, in my own way, explicitly crafting a career that contributed to transforming the food system. In addition, I had substantial networks and relationships within the agroecological and organic farming community.

This positioning presented an opportunity for deeper and more effective engagement informed by a contextual understanding and awareness of the system I intended to research. However, it also presented a number of potential challenges that needed to be recognized so that they could be properly managed. The well-established theory on action research in educational settings (Corey 1953; Schon 1983; Cochran-Smith & Lythle 1993; Brookfield 1995) assisted in managing these challenges. These are covered in more detail in section 1.9 on Research Limitations.

Then, as a final consideration in this section on research methodology, the types of knowledge that the methodology sought to generate warrants attention. Hadorn and Pohl (2008) suggest that social science research typically generates three distinct types of knowledge: systems knowledge (knowledge about things as they currently are), target knowledge (knowledge about

where things should/could be) and transformation knowledge (how to move from the current to desired state). Klein (2012) alludes directly to this in her definition of action research mentioned above.

This research set out with a transformational agenda and, as such, the generation of transformational knowledge was a central objective. However, recognition of the need to take youth perspectives seriously implied working with youth to generate knowledge about what they currently experienced (systems knowledge) as well as what they wanted (target knowledge). The process of doing this assisted in building an understanding of how they could be supported to get what they wanted (transformation knowledge). Similarly, the search to understand the nature of existing niche networks implied concurrent generation of substantial systems knowledge about where existing capacity resided, along with insights into how this could be better accessed and distributed (transformation knowledge).

As such, in designing the research approach and in selecting methods for each of the three papers, an intentional balance was struck. This was a balance between the generation of systems, target and transformation knowledge. This is summarized in Table 1.2 below.

Table 1.2. Methodological summary of three papers

	Methodology	Method	Data generated	Knowledge Generated
Paper 1	Interdisciplinary	SenseMaker, narrative based enquiry	Qualitative and quantitative	System & target knowledge
Paper 2	Interdisciplinary	Net-Map	Qualitative and quantitative	System/transformational
Paper 3	Interdisciplinary	Net-Map	Qualitative and quantitative	System/transformational

1.7.2 POSITIONING OF METHODS, RESEARCHER AND THEORY

Within this type of interdisciplinary research - in which the researcher is an active and invested participant in the system being studied - clarifying the positionality of researcher, theory and methods becomes particularly important to the integrity of the work (Klein 2012). This section briefly positions the research process and my own personal relation to each of the three papers within the Multi-Level Perspective (MLP). In brief the MLP is applied to the study of transitions within complex, large-scale, socio-ecological systems (Smith, Vos and Grin, 2010). The MLP provides a systems-based approach to understanding the ways in which small pockets of innovation (niches) can disrupt and transform the mainstream trajectory of a particular dominant system (regime) in the context of wider changes taking place across a given system 'landscape'. The MLP and other frameworks for thinking about transitions such as Socio-ecological Transformations, are covered in depth in Chapter 2.1.3.

 Each of the three papers presented in this thesis relate to understanding the dynamics of transition at a particular point in the MLP.

Paper 1 conceptualizes the unfolding youth dynamic in the region as a 'landscape' level pressure that will influence the nature of the prevailing food regime.

Paper 2 seeks to understand emerging learning dynamics at a 'niche' level.

In light of insights from the 'landscape' (Paper 1) and 'niche' (Paper 2) levels, Paper 3 then seeks to explore methods by which knowledge and learning within niche environments can be amplified to assert agency over existing 'regimes.'

Each of the three papers are highlighted in relation to the MLP in red below - see Figure 1.3.
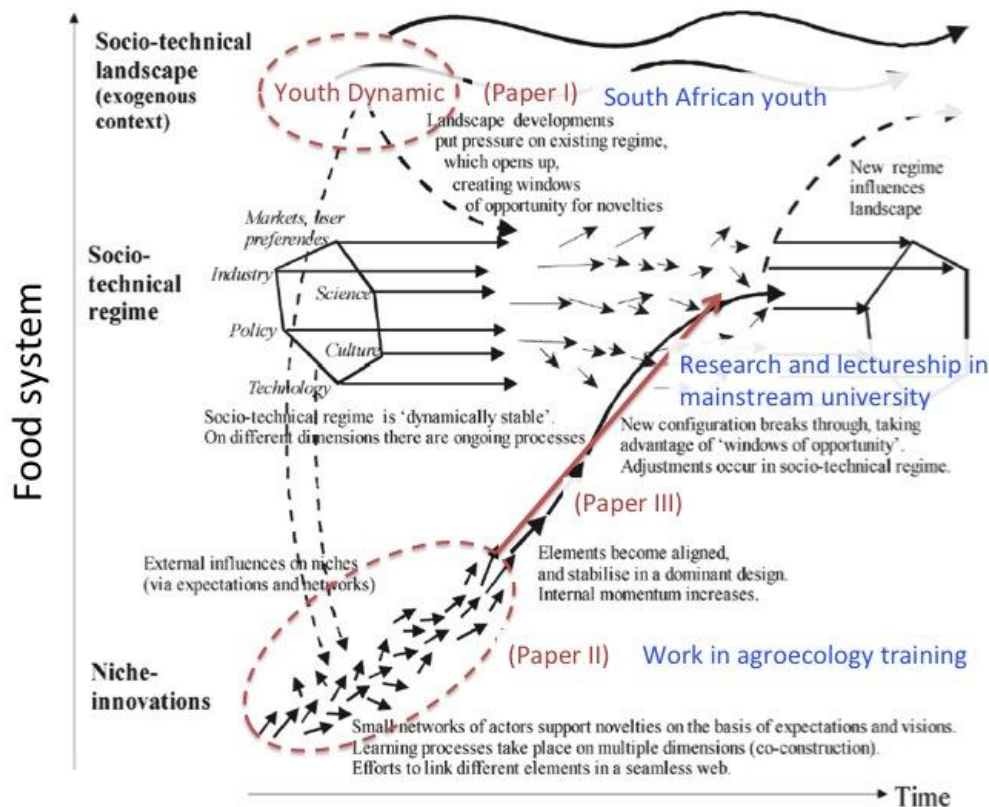
Figure 1.3: (Source: adapted from Geels & Schot 2007).

On Figure, 1.3, adjacent to each of the papers, my own relationship to each of these papers and the MLP heuristic is indicated in blue. With respect to the 'landscape' that informs the shape which the food regime takes, I am a South African 'youth'. I am therefore part of the unfolding youth dynamic around careers in agriculture which Paper 1 explores.

At a 'niche' level, I have also been involved in this system as educator and conscientious consumer for the last 10 years. This connects me personally to the content of Paper 2 that focuses on niche learning.

At a food 'regime' level, I am a middle class food consumer who benefits from many of the unequal and unsustainable elements of the current food regime. I also work within the research and training framework of Stellenbosch University, a prominent voice in South Africa's current and historical agricultural arena which has contributed to the formation of the current

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manifestation of the food system.

The multiplicity of levels on which I am reflected in the heuristic is consistent with a complex systems worldview in which agents within a system can represent a multitude of seemingly contradictory positions simultaneously (Woodside 2014). As a researcher, my choice of approach casts me into a boundary-spanning role within the system (Tushman & Scanlan 1981).

1.7.3 STUDY AREA

Broadly, the study area selected for this study was the South African food system, and specifically the agricultural sector. South African agriculture was racially, geographically and economically segragated under apartheid and the three centuries of colonisation that preceed it. As a result, South Africa today has what is often described as a 'dual' agricultral economy (Greenberg 2015). One sector reflects the type of large-scale, capital intensive farming typically associated with North America or Australia, and the other reflects a small-scale subsistence and semi-subsistence sector. The former is still owned and managed almost exclusively by white people, while the latter is often owned communally and managed almost exclusively by black people (Kirsten & Van Zyl 1998).

Following the transition to democracy in 1994, and the re-entry into the global agricultral economy which followed, a range of economic policies were adopted that further distanced these two systems. Very little middle gorund exists between the two. This thesis intentionally positioned itself and its focus in this middle ground between these systems, and focuses on two distinct elements of the agricultural system: youth attitudes and niche knowledge networks.

The first paper explores youth attitudes towards agricultural livelihoods based on three sample sites in distinct sub-locations across South Africa. A target population of youth between the ages of 16 and 35 was selected from the three sites, each from a distinct climatic and cultural region in South Africa; the Western Cape, KwaZulu-Natal and Limpopo province (see points 1, 2 and 3 respectively in Figure 1.4 below). Each sample site was located within, or in close proximity to, agriculturally active landscapes. Considering the dual agricultural system, study sites 2 and 3 were located in rural regions where both large-scale and small-scale farming was in operation. Site 1 was positioned in the urban area of Cape Town, where pockets of urban and peri-urban small-scale farming exist, but the dominant form of agriculture is large-scale.
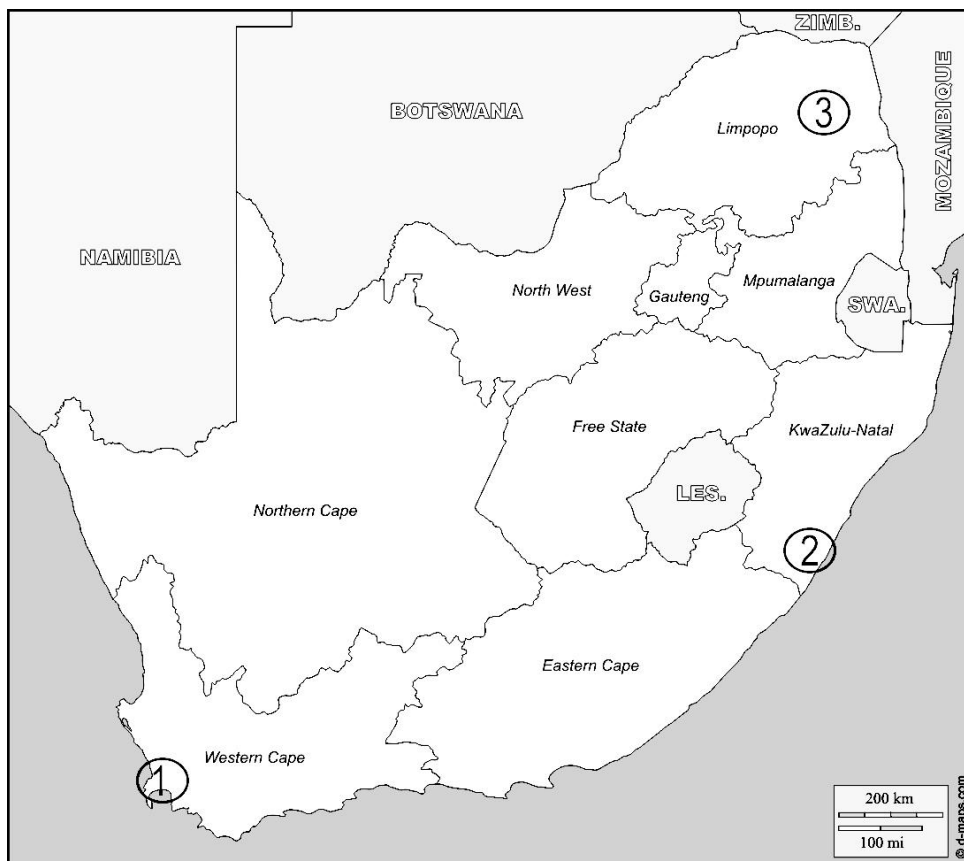
Figure 1.4: Paper 1 case study sites (Source: *authors own*).

Defining a case study niche network for the second and third papers was more difficult because many different and competing niches exist within the food system. These are informal, loosely associated constellations of actors that exist in open relationship with one another. For research purposes, this makes identifying niches and defining boundaries around a niche particularly challenging. Who is, or is not, considered part of a given niche, will depend very much on when and whom you ask.

Defining a sustainability niche is covered in more detail in section 2.1.4, but for the purpose of defining a case study, Geels's definition is used. Geels (2012, 2015) defines niches as locations of radical innovation within which small networks of actors support novelties (social, ecological or technological) on the basis of experimentation and shared visions.

Selection within this definition was based on three criteria:

1. The perceived relevance of the niche to youth – informed by Paper 1.
2. Its transformative potential, understood in this case to mean a coherent long-term alignment with the principles of economic and social justice, as well as ecological sustainability.
3. The availability of a distinct niche with a common narrative and binding set of principles that could be identified in order to isolate the niche for study – in this case a commitment to the principles of organic and agroecological production, led by small farmers and feeding into localized distribution systems.

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A range of organisations and actors are emerging in South Africa which meet these criteria. The emerging coalition between these actors represents an increasingly coherent and structured set of actors who share a transformative vision for the food system. The proliferation of alternative retail outlets backed by a variety of alternative suppliers, the establishment of the South African Organic Sector Organisation (SAOSO), a drive from the legislation of organic standards, and a growing number of regional PGS (participatory guarantee system)[2] networks forming across South Africa are all indicative of this emerging coalition. Collectively, these actors have piloted a set of radical alternatives to the dominant models of food production, distribution and retail that are explored in more detail in Chapters 4 and 5.

From the perspective of transition frameworks that focus on the role of niches (such as the MLP and SET), this diverse coalition of farmers, retailers, community members and others, is a textbook example of an emerging systemic niche (Geels & Scott 2007; Smith & Raven 2012). In order to demarcate a study boundary around a particular set of competencies within this emerging network, the organic farming component was selected for study. While the notion of being *organic* per se is not considered a prerequisite for sustainability, the term (relative to other terms such as 'agroecological') was well understood among actors throughout the network. This shared understanding provided a relatively well-defined subset within the overall network of actors.

Respondents were centred around the Western Cape where a comparatively well-established node of practice existed. In accordance with the snowball sampling approach used, prominent support organisations in Kwazulu Natal and Gauteng provinces were also included.

The sampling process, breakdown of respondents and the analysis of data is covered in detail for each paper in Chapters 3, 4 and 5.

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[2] IFOAM defines Participatory Guarantee Systems as 'locally focused quality assurance systems. They certify producers based on active participation of stakeholders and are built on a foundation of trust, social networks and knowledge exchange.' (IFOAM 2018, p1)
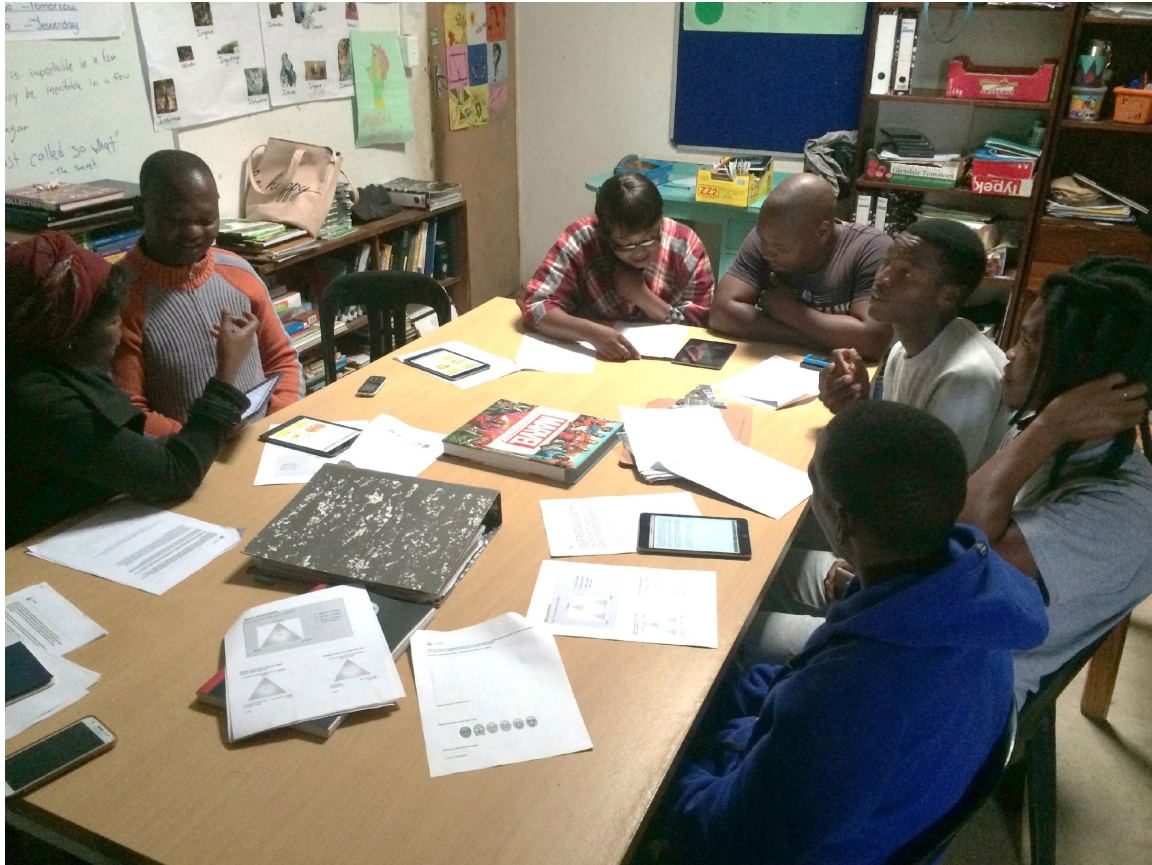
Figure 1.5: Training field workers to use SenseMaker on tablets in the Ugu District of Kwa-Zulu Natal by Luke Metelerkamp.

1.7.4 RESEARCH ETHICS

This research adhered to the ethical guidelines laid out by Stellenbosch University and ethical approval was obtained from the university's ethics committee for all aspects of the research. Given that many of the respondents that the SenseMaker process interacted with were unemployed, explicit care was taken not to bias results or cause harm by building false expectations relating the promise of future work.

Participation in all aspects of the study was completely voluntary and undertaken with consent. No payments or gifts were made to any of the respondents.

Data was processed and presented in a way that ensured participant anonymity. All digital data was stored with password protection.

No funding was provided that in any way affected the nature or content of the findings presented in this thesis, and I have no conflicts of interest to declare.

1.7.5 *Declaration of authorship and contribution to papers*

Papers 1 **and 2**

As the doctoral candidate, I took sole responsibility for the study design, data collection and data analysis. My supervisors, Prof. S Drimie and Prof. R Biggs, provided input and guidance around the design and methodology. They also provided editorial comment on each draft of the paper leading up to submission. I took full responsibility for the journal selection and submission process, as well as revisions following peer review.

Paper 3

As the doctoral candidate, I took sole responsibility for the study design, data collection and data analysis. I also took the lead in drafting the paper, selecting and inviting the two co-authors, and managing all co-author input. External content specialists were invited for expert comment once the first draft had been compiled. Prof. David Greenwood, who is the Canadian Research Chair in Environmental Education, provided editorial comment with specific reference to place-based educational content. Eva Schieffer who originally developed the Net-Map method for the International Food Policy Research Institute, provided editorial comment on drafts with specific reference to application and adaptation of Net-Map. As global leaders in their respective fields, both co-authors also provided formative theoretical guidance during the formation of this paper.

1.8 Excluded research

It is also important to note that there was research conducted during the course of this thesis that was ultimately excluded from this final submission. The reasons for this are given below.

A study into youth aptitudes was piloted in partnership with the youth employment accelerator Harambee. This sought to profile successful sustainability pioneers in order to create more accurate student character profiles for recruiting agricultural students. The premise was that the personality traits which predicated success within the agricultural space were poorly understood, which meant that training institutions were ill equipped to make informed decisions about student recruitment. On the one hand available research suggested that, for many, agricultural study was a choice of last resort. While on the other hand, the Sustainability Institute and Harambee's experience told us that success as an emerging farmer required a diverse and demanding set of aptitudes and personality traits. For example: farmers needed to be both comfortable working in quite slow and solitary ways, while at the same time adept at building relationships for marketing their produce; they needed to be keenly attentive to the dynamics of complex natural systems and at the same time be fastidious long-term planners and skilled financial risk managers. We were concerned that society collectively underestimated the highly specialised skills and aptitudes required for farmer-led agricultural change and speculated that this in turn led to low success rates and miss-allocation of scarce training

resources. The hypothesis then followed that if we could get better at understanding the aptitudes and personality traits of successful pioneers, we could get better at student recruitment and selection.

This line of research was abandoned for two reasons: first, there were issues pertaining to scientific integrity of the data and the field methods used by Harambee in their youth profiling. We felt this would not stand up to the scientific scrutiny of a doctoral examination. Second, the scope of the work was moving into the realms of youth psychology and a field of literature around aptitude testing and profiling approaches which neither my supervisors nor I felt equipped to navigate.

This four-month engagement with Harambee did, however, provide valuable understanding of work-readiness among youth in South Africa. It provided insights into a wide variety of soft skills that limit youth employability from time-keeping to basic communication skills. A basic level of awareness around the importance of these skills was important in highlighting some of the limitations of the Net-Map tool reviewed in Chapter 5.

1.9 RESEARCH LIMITATIONS

1.9.1 LIMITATIONS OF APPROACH

As alluded to in section 1.7.1, my role as an actor within the networks I planned to study had its limitations. Klein describes action research as a 'systematic, intentional inquiry by teachers [or other practitioners] to bring about practical improvements, innovation, change or development of social practice' (2012, p1). As someone involved in education, working to solve problems within my own context, Klein's definition suggests that I was, to some extent, engaging in an action research. Although this was not explicit in the three papers themselves, viewing the overarching research process from this perspective assisted in drawing attention to common issues faced by researchers choosing to work within familiar social contexts. These included:

1. A poor understanding of the relationships between method, methodology and theoretical frameworks leading to inappropriate positioning of researcher within the research (see positioning of research in theory below)
2. Un-acknowledged researcher bias and subjectivity during problem framing, data collection and analysis undermines research outcomes – the need for reflexivity
3. Work falls into the trap of un-acknowledged sampling bias as a result of researcher's existing networks. This 'network blindness' leads to skewed or incomplete results favouring the researcher's existing view of the system.
4. Data validity is connected to perceptions of researcher dependability (Hess-Biber & Leavy 2011) - subjectivity is acceptable, on condition that method is explicit and rigorously adhered to.

While attempts were made to mitigate these through each of the three stand-alone papers, sections 1.7.1 and 1.7.2 provide some overarching contextualization which speaks specifically to points 1 and 4 above.

1.9.2 LIMITATIONS OF SCOPE

From an employment perspective, there are a wide range of other career options in the niche space beyond the on-farm jobs that were the focus of this study. These include jobs in alternative retail, agroecological/organic input supply and food processing. Due to time and resource constraints, this study limited itself to the on-farm component exclusively.

The SenseMaker paper into youth narratives presented in Chapter 3 is exploratory in nature and not representative of youth at a national level. The findings from Chapter 3 were agriculture-specific and not designed to be comparative with attitudes towards other career fields. Therefore, while some indication was gained about youth attitudes towards work in agriculture, meaningful comparison between their attitudes towards agriculture and other career fields was not possible within the scope of this study.

For its part in this thesis, the Net-Map research presented in Chapters 4 and 5 was largely qualitative in its scope and exploratory in nature. While the sample that was taken attempted to be broad and inclusive in its scope, the size of the sample and sampling approach taken mean that the findings cannot be considered representative of the organic sector in South Africa. Nor can it be considered to be representative of transformative niches more broadly in South Africa. It is representative of one set of views on the niche at a particular moment in time.

1.9.3 LIMITATIONS OF METHODS

Furthermore, while SenseMaker as a method aimed to support narrative self-signification by participants, the method remains limited in its ability to allow respondents complete freedom in the meaning they attribute to their stories. This is because the signification framework is set by the researcher. Thus, the method is limited by an inescapable compromise between the ability to quantitatively compare narratives and qualitative richness of the meaning respondents attribute to their stories.

Net-Map, as a method, was not designed with the mapping of learning and competency networks in mind. However, the method is highly flexible and adaptable. The merits and limitations of Net-Map are discussed in detail in Chapter 5.

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2. Conceptual framing: Linking literature on transitions, food systems, youth and learning

This study was informed by my work as an educational practitioner working with youth in the food system. The questions that motivated and informed this research were not borne out of an academic career, but rather the mess of civil society practice in post-apartheid South Africa. The search for knowledge to inform the educational challenges those of us working in the alternative agriculture space faced was interdisciplinary from the start. In assessing the literature, the intention was to bring together four distinct bodies of knowledge in order to provide an integrated conceptual framing for the study. Namely, work on Youth and Livelihoods, Food Systems, Education, and Systemic Transitions. The intention of this chapter is not to provide an exhaustive review of each of these bodies of knowledge, but rather to highlight some of the most relevant contributions from each field, and the connections and overlaps between them. This was done in order to develop a more holistic understanding of the complex problems this research sought to understand.

The literature review followed an intentional, multipoint snowball sampling approach, which spanned the three-year period of this study. This began with database searches within the four distinct fields of literature and then followed lines of references and cross-references which connected to the other three bodies of literature. In doing so, the literature review sought out an area of focus at the point of convergence between the four fields of literature (Figure 2.1).
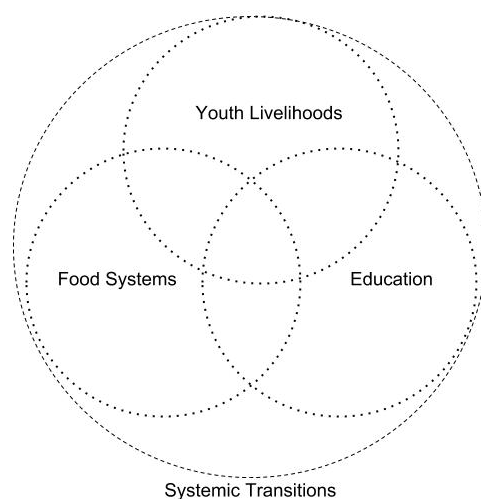
Figure 2.1: Overview of four main bodies of literature (Source: author's own).

As with any study engaging with complex socio-ecological systems, the task of drawing boundaries around the study was a challenging one. Given the rich web of networks that informs the interconnectivity of all things, the challenge of deciding what to exclude from this literature study was no different. While the list of what's not included is long, specific mention

needs to be made of the emerging body of potent literature on the decolonisation of education in South Africa (Wa Thiong'o 1992, Heleta 2016, Le Grange 2016, Lotz-Sisitka 2017) and, to a lesser extent, post-development theory (Rahnema & Bawtree 1997, Zai 2007, Escobar 2011). The former calls for an end to epistemic violence and the latter is a critique of industrialised superiority. Together, these two bodies of literature, while not explicitly covered below, warrant mention because they align with the values which underpinned this work and are implicit in much of what unfolded in the three papers presented in Chapters 3, 4 and 5.

The following sections provide an overview of each of these fields, in relation to the specific questions the research sought to answer (see section 1.5), thereby providing the conceptual framing for the study. In recognition of the importance of the role of the public sector, the literature review then concludes with a brief scan of some key policy documents in South Africa relating to these four fields.

2.1 TRANSITIONS AND NICHES

While the importance of increased research into understanding innovation and transitions within the food system is gaining momentum, very little empirical research has been done linking transition and innovation studies to processes of change within the food system. In a 2012 assessment of 540 peer reviewed papers on sustainability transitions published between 1998 and 2011, Markard et al. (2012) found that, whilst sustainability transitions researchers made frequent reference to food systems as an important and relevant domain for investigation, only 3% of the peer-reviewed articles in the assessment focused directly on food systems.

This section briefly reviews a number of frameworks for understanding systemic transitions, leading to a justification of the use of the MLP as the main guiding framework for this thesis. It then goes on to explore the MLP in more detail. This detail covers research into the management and support of sustainability niches, the role of learning and networks in niche emergence, conceptualisations of scale and scaling, and the application of MLP linked thinking to the food system in emerging economies.

2.1.2 CONSIDERING THEORETICAL FRAMEWORKS

A range of theoretical frameworks exists for considering systemic transitions. The most pertinent to the research addressed in this thesis is the work on social-ecological transformations, the work on socio-technical transitions, and the social practices approach.

The work on social-ecological transformations (SET) takes a complex adaptive systems perspective on transformation between interconnected social and ecological systems (Olsson 2004a; Moore et al 2014). As a framework it has strong conceptual ties to resilience theory, drawing on Holling's (1986) adaptive cycle that views innovation, adaptation and transformation as defining elements that exist in dynamic feedback with one another (Folke et al 2010, Pelling & Manuel-Navarrete 2011; Westley et al 2013). Similar to frameworks within

the field of socio-technical transitions (discussed below), the SET framework focuses on a multi-phased approach to transitions and highlights importance of safe spaces for experimentation and innovation. Olsson describes these phases as preparation, window of opportunity, and consolidation (Olsson et al 2004b, Olsson et al 2006).

Embedded within these three phases is a wide set of literature covering the role of individuals and coalitions involved in each phase (Folke et al. 2003, Olsson et al 2006, Westley et al 2013. P27). The more recent literature on this seems to have settled on the notion of systems or social 'entrepreneurs' as the best catch-all term for the individuals who 'make change happen' (Westley et al 2013. Olsson et al 2017). This focus on the role of individual and collective agency is similar to other socio-technical transition frameworks that speak of innovation 'brokers' and 'networks' (Klerkx & Leeuwis 2009, Batterink et al. 2010), and what scholars of social movements speak simply of as 'activists' and 'social movement networks' (Diani 2007, Keck & Sikkink 2014).

Unlike frameworks on socio-technical innovation SET frameworks carry a historical lineage connecting it to ecological systems. This ecological element contributes to some extent to the agroecological leaning of the networks which this thesis studies. However, many of the case studies on which SET are based have focused on local scale transformations - particularly fisheries and ecosystem management approaches (Olsson et al 2004b, Olsson et al 2006, Andrachuk et al 2018) - rather than wider systemic change.

Existing in parallel to SET are a group of social transition frameworks that focus more on technological innovation and social learning components of change. Socio-technical transition studies focus on three similar and related approaches, namely the multi-level perspective (MLP), strategic niche management (SNM) and sustainability transition management (STM) (Markard et al. 2012). Olsson et al (2014. P6) note that 'There are clear points for collaboration and integration' between these socio-technical frameworks and SET. Broadly, these three socio-technical approaches offer a systems-based approach to understanding the ways in which small pockets of innovation (niches) can disrupt and transform the mainstream trajectory of a particular dominant system (regime) in the context of wider changes taking place across a given system 'landscape'. A more detailed outline of the MLP is covered in in section 2.1.3 below. In comparison to SET frameworks, the MLP and SNM frameworks have been widely applied and adapted to the field of agricultural and food system transitions (Klerkx & Leeuwis 2009; Klerx *et al.* 2009; Batterink *et al.* 2010; Kilelu e*t al.* 2011; Klerx *et al.* 2012; Kirwan *et al.* 2013; Cohen & Lieva 2015).

Shove and Walker (2007) provide some helpful critique of this cluster of approaches. Primary among these, are that through the focus on large-scale systemic transitions, heuristics such as the MLP tend to focus attention on the large systemic actors such as governments and big business. As a result, they lose sight of the 'ordinary arenas of everyday life' and the mechanisms of change associated with these (Shove and Walker 2007. P7).

In response, Shove and Walker (2007, 2010) contrast the MLP with the social practices approach (SPA), arguing that MLP is a useful but narrow way of thinking about how transitions actually unfold. They add to the theory of change by highlighting the pivotal role which understanding and influencing small daily actions and practices in thinking about and achieving systemic transition. Their focus rests heavily on an understanding of how micro-level habit

formation and shifting takes place and then feeds up through various levels of scale to result in larger system transformation. While their research does not link explicitly to the food system, their focus on the power of habit and day-to-day practice seems relevant to the food system - particularly at a consumer level.

In contrast to the SET, MLP and SPA framings, there is a broad body of more loosely defined literature on left-leaning social transitions. This focusses more explicitly on processes of radical social transformation and social movements in contexts of political revolutions, labor movements and class struggles. While these employ very different language, some interesting similarities exist between the MLP's relatively conservative political perspective (borne out of an original intent to understand how technological innovations spread) and others further to the left trying to understand explicitly how social movements spread. Although they may differ on a number of other fundamental levels, Zechener and Hansen's 2015 essay *Building Power in Crisis of Social Reproduction* displays a striking interplay between the notions of building social constituency common to MLP, SET and Marxist notions of social reproduction.

Biehl (2015), in describing the social movements that underpinned the Arab spring, highlights the importance of street level social structures with networks of affiliation and trust. These local-level citizen networks were critical vessels that existed and were ready to channel the energy of collective citizen action when the broader political climate heated up across the region. She argues that for revolutions to succeed, 'history must be on its side'. However, because 'it is impossible to predict when social crises will take place, emancipatory institutions must be consciously created well in advance of the revolutionary moment, through painstaking, molecular work.' (Biehl 2015, P75).

What Beihl describes, in different language is the interplay between landscape-level windows of opportunity and niche networks that form the foundation of the MLP (Smith, Vos & Grin 2010, Geels 2004). It's also similar to what Olsson et al (2014 p3) describe in SET as the role of 'shadow networks' in long preparation phases leading up to windows of of opportunity for transformation.

Writing on approaches to building power to challenge current systems of social reproduction, (Zechener & Hansen 2015, p138) note that:

'Under certain conditions, collective projects to reorganize how we meet our needs can provide alternatives more powerful than charity, communitarianism and individualized survival. Starting from a shared need, these conditions include the emergence of murmurs that discuss alternatives in the streets, squares, homes and workplaces; the building of shared relations of conversation and trust; and with this the creation of spaces for meeting and finally for organizing.'

These relatively autonomous circuits of self-reproduction, they argue, are powerful in challenging dominant power structures because they allow 'people to partially withdraw from hegemonic circuits of self-reproduction' (Zechener & Hansen 2015, p139).

This bears a striking resemblance to how Smith *et al* (2010) define sustainability niches: as 'protective spaces for path-breaking radical alternatives'.

Ramos-Mejía et al.'s (2018) work translating the MLP to conditions of poverty in emerging economies further strengthens this link. They argue that considering socio-technical transitions in emerging economies, transition scholars need to focus specifically on reconfiguring power imbalances. This means embracing high levels of social complexity while explicitly working to reconfigure power imbalances. They go on to argue that failing to do so, can do more harm than good for the following reason: In contexts where 'both formal and informal institutions are contested (i.e. exhibit problems of legitimacy) and personalised (i.e. in the hands of elitist groups) promoting innovation without addressing inequality can worsen existing class divides (Ramos-Mejía *et al.* 2018).

Predating the socio-technical innovation research that has characterized MLP and SNM research into the food system, an extensive body of literature characterizing the current 'food regime' has also been written since Friedmann & McMichael initially coined this term in 1987 (Friedman 1993; Reardon *et al.* 2003; McMichaels 2009; Holt-Giminesz & Shattuck 2011; Bernstein 2016). Analysis of this literature (see section 1.3) suggested a theoretical resonance with the intentions of this thesis. This resonance with the MLP and SNM (relative to SET) stems that these two approaches place more emphasis on social learning and the study of what happens socio-technically in grassroots networks. The MLP and SNM therefore related directly to this thesis's focus on grassroots innovation and learning in the food system.

Highlighting the underlying coherence between theories of change that trace their origins to ecological and technical systems, and those connected to socio-political class struggles is important in the context of this study. Achieving a transition within the food system requires a heuristic capable of grappling with the complex diversity of current system, including structural questions of accumulation from below.

In the context of this study, the MLP's comparatively extensive application to the field of agricultural innovation and food system transformation implied that the MLP was theoretical relevant to this study. Given the fact that this research focussed on social attitudes as well as the development and diffusion of new socio-technical configurations, the MLP's framing of niche's and regimes fitted the problem context. As a guiding model for understanding food system transitions in the context of in the context of the institutional and cultural arrangements that facilitate or restrict change, the MLP provides a bridge to other prominent framings the food system - particularly Friedmann & McMichael's (1987) work on food regimes. While Friedmann & McMichael's work defining food regimes through history pre-dates the MLP, the way that both bodies of literature define the 'regime' as an incumbent configuration of institutions, policies, market arrangements, etc. provide an opportunity for combining these ideas into a more interdisciplinary understanding of how change within the food system can be realised.

With this in mind, this research draws on a broad set of literatures (including SET, SNM and theory on social movements) but positions the Multi-Level Perspective (MLP) as the guiding theory of systemic transition for this study of youth skills development within the food system. While care needs to be taken to avoid oversimplification, the allure of the MLP in the context of this study is that it provides a relatively straightforward way of ordering and simplifying the analysis of complex, large-scale structural transformation within the food system.

2.1.3 HOW SYSTEMIC TRANSITIONS HAPPEN

Initially conceptualized as a heuristic framework for the study of technological innovation and its intertwined relation with social systems, the MLP is increasingly applied to the study of transitions within complex, large-scale, socio-ecological systems (Smith *et al.* 2010). The MLP provides a systems-based approach to understanding the ways in which small pockets of innovation (niches) can disrupt and transform the mainstream trajectory of a particular dominant system (regime) in the context of wider changes taking place across a given system 'landscape' – see Figure 2.2.
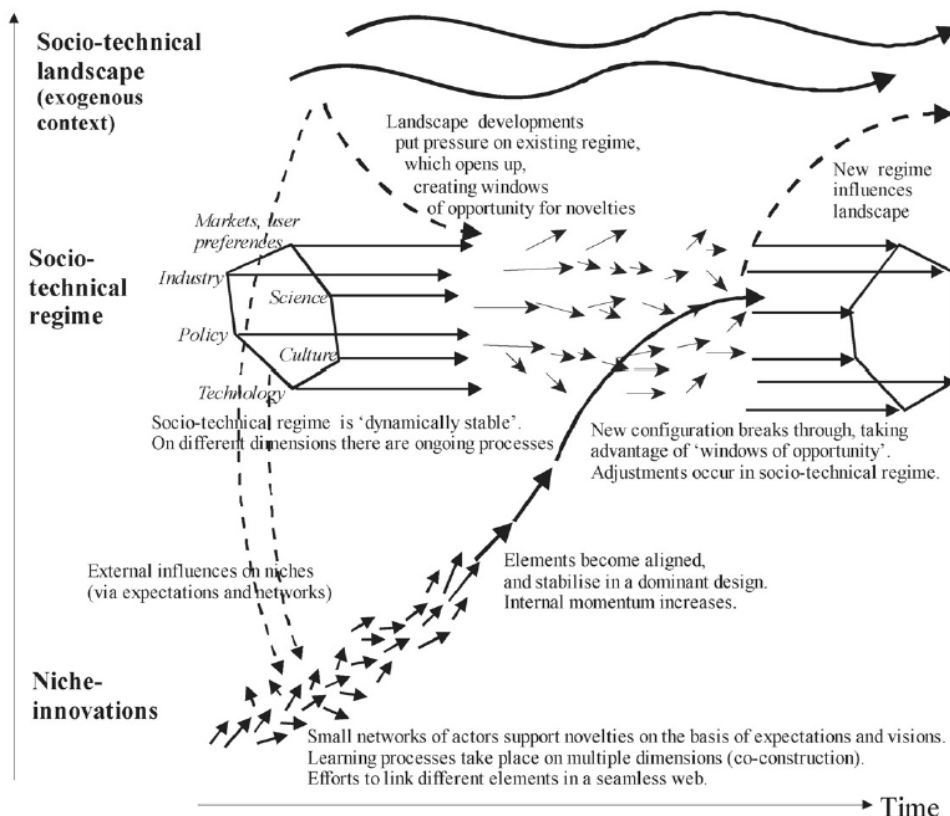
Figure 2.2: Dynamic system-change over time from Multi-Level Perspective (Source: Geels & Schot 2007).

The MLP framework emphasises how experimentation and learning coalesce at a micro level into wider movements capable of shifting entrenched regimes at micro and macro levels. At the same time, it considers how changes taking place within the macro landscape in which a particular regime exists, may create 'cracks' or 'windows of opportunity' which favour (or repel) the ability of a particular niche to shift the current regime. More recent applications of the MLP have extended to include regime resistance to change. Geels (2014) cites resistance by the current non-renewable energy regime to new renewable technologies as an example. Geels stresses the need to consider active approaches for regime destabilization when attempting to mainstream green technologies. In this sense, regimes need to be considered as resilient and adaptive systems displaying high degree of relational interdependence which stabilises the regime against "shocks" from emergent niches.

From the MLP perspective, a systemic transition is considered to have occurred when a particular constellation of niche practices or technologies are fully embedded into society (Genus & Coles, 2008).

2.1.4 WHAT IS A SUSTAINABILITY NICHE?

Due to the centrality of the concept of a niche space to the MLP as well as to the overarching objectives of this research, this concept warrants closer inspection.

Smith *et al. (2010)* describe niches as 'protective spaces for path-breaking radical alternatives' whose performance may not be competitive within the prevailing selection environment of the regime. As such, niches can be considered as a source for transformative ideas and capabilities, but not as blueprints for the future (Smith *et al 2010)*. Geels describes niches as locations of radical innovation where 'dedicated actors nurture alignment and development on multiple dimensions to create configurations that work' (Geels 2010 p495). Niche success ultimately rests upon broader circles of more powerful actors becoming involved in ways that mobilise widespread social legitimacy (Smith *et al 2010)*.

Pereira *et al.* (2018) link the niche to the notion of a seed. A space in which isolated, small-scale experiments begin to germinate as the right conditions for their survival are achieved. As these 'seeds' grow, the lived experiences and narratives of those surrounding them begin to shift. In time, this fuels the articulation of new meta-narratives and values that create a systemic awareness of the need for change. Sharpe *et al* suggest that it can also be helpful to think of niches as 'pockets of the future in the present' (Sharpe et al 2016 p1).

While these these definitions emphasize the idea of protected spaces in which transformative coalitions begin to emerge, Geels definition best captures the spirit in which niches are considered within this research. That is to say niches are: locations of 'radical innovation' (Geels 2014. p3) within which small networks of actors support novelties (social, ecological or technological) on the basis of experimentation and shared visions (Geels 2012, Geels and Schot 2007). Through learning processes which unfold during this process new competencies develop, and over time the niche grows through efforts to link different elements together (Geels 2014).

2.1.5 HOW TO GROW A NICHE – NARRATIVES AND PROTECTED SPACES

According to Moore et al (2015) "Sustainable Niche Management scholars have devoted considerable effort to understanding how to create a 'niche' that is safe and have provided detailed understanding about the mechanisms of shielding, nurturing, and empowering". This tends to highlight the importance of creating protective spaces in which experimentation can thrive, 'shielded from the prevailing competitive advantages of the established regime it seeks to challenge' (Smith Vos and Grin 2010).

The dynamics surrounding protective spaces exhibit three functional properties in relation to wider transition processes: shielding, nurturing and empowerment (Smith and Raven 2012).

> 'Shielding involves processes that hold off selection pressures in the context of multi-dimensional selection environments (industry structures, technologies and infrastructures, knowledge base, markets and dominant user practices, public policies and political power, cultural significance).
>
> Nurturing involves processes that support the development of path-breaking innovation within passive and active shielded spaces through the development of shared, positive expectations, social learning and actor network building.
>
> Empowering involves processes that make niche innovations competitive within unchanged selection environments or processes that change mainstream selection environments favourable to the path-breaking'.
>
> (Smith and Raven 2012, p1034)

While this focus on protective spaces has been widely advocated, it has not been without criticism. Hommels et al. (2007), question the desirability of these protected spaces. Based on studies in the transport sector they argue that innovations in socio-technical systems 'have a better chance of success if made "vulnerable" by subjecting them to risks and oppositions from the outset' (Hommels *et al.* 2007, p1). While Smith et al. (2007) caution against attributing too much agency to niche's in the transition process.

Smith and Raven (2012), like Pereira et. al. (2018), draw attention to the role which narratives emerging from the niche play in challenging the prevailing regime. Smith and Raven stress that narratives emerging from niche environments are 'key political devices used by global actors to argue for niche-derived (yet contested) institutional reforms or claim present-day competitiveness within unchanged selection environments.'

They differentiate between two types of niche trajectory as they grow in power: Niches that eventually fit and conform to the wider regime and landscape in which they operate (normative), and those that stretch and transform (transformative). Each, they argue, require very different forms of political narratives.

Smith and Raven (2012) suggest three interrelated types of narrative in protective spaces. Narratives conveying:

> 1. Positive expectations about the future that justify the niche to wider audiences;
>
> 2. Explicit claims for present-day niche friendly institutional reforms;
>
> 3. Statements that re-frame the past to challenge the prevailing regime in ways that emphasise future opportunities for the innovation

Of central importance, are the ways in which narratives frame the nurturing and shielding conditions that surround the niche. From a normative perspective, the shielding conditions surrounding the niche are framed as temporary measures to be phased out over time as the

niche matures. In a transformative perspective however, narratives 'seek to convince the wider world that fundamental rules of the game need to be changed' (Smith & Raven 2012, p1032) and that the shielding measures supporting niche emergence represent the need for fundamental change to broader selection environment (in this case the food system). Nurturing niches under a transformative scenario is seen to be as much about a process of values shifting at a societal level, as it is about taking the time to fine tune technologies (Van der Bosch & Rotmans 2008).

This is reiterated by Moore *et al.*, who suggest that 'creating new stories and amplifying those that exist [are] an important vehicle for generating cultural ideas and thus, scaling deep to affect the 'regime' level of institutions" (2015, p50)

2.1.6 *SCALE AND SCALING OF NICHES*

Scaling niche innovation to effect large-scale change will necessarily involve a more complex and diverse process than simply 'diffusing' a product or model (Moore *et al.* 2015)

Van der Bosch and Rotmans (2008) identify three central pathways through which niche experimentation contributes to transitions: deepening (learning as much as possible in a specific context), broadening (linking and repeating in different contexts) and scaling up (embedding the experiment in -new-dominant ways of thinking, doing and organizing). These pathways are presented in relation to the MLP in Figure 2.3 (Van der Bosch & Rotmans 2008). Below this figure, in Table 2.1 (Moore *et al.* 2015) elaborate on this, providing examples of the main strategies through which each of these three types of scaling are pursued.
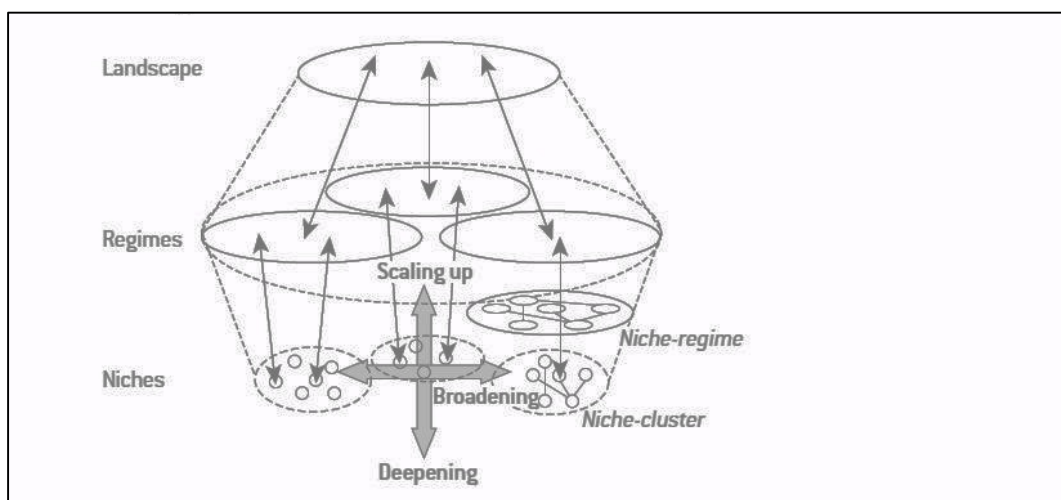
Figure 2.3: Deepening, Broadening & Scaling up transition experiments in niches in relation to Multi-Level Perspective (Source: Geels & Kemp in Van der Bosch & Rotmans, 2008).

Table 2.1 Three types of scaling and their main strategies (Source: Moore *et al.* 2015)

Table 1 Three types of 'scaling' and their main strategies

	Description	Main strategies
Scaling out:	**Impacting greater numbers.** Based on the recognition that many good ideas or initiatives never spread or achieve widespread impact	**Deliberate replication.** Replicating or spreading programmes geographically and to greater numbers while protecting the fidelity and integrity of the innovation **Spreading principles.** Disseminate principles, but with an adaptation to new contexts via co-generation of knowledge, leveraging social media and learning platforms: 'open scaling'
Scaling up:	**Impacting law and policy.** Based on the recognition that the roots of social problems transcend particular places, and innovative approaches must be codified in law, policy and institutions	**Policy or legal change efforts.** New policy development, partnering, advocacy
Scaling deep:	**Impacting cultural roots.** Based on the recognition that culture plays a powerful role in shifting problem-domains, and change must be deeply rooted in people, relationships, communities and cultures	**Spreading big cultural ideas** and reframing stories to change beliefs and norms. Intensively share knowledge and new practices via learning communities, distributed learning platforms and participatory approaches **Invest in transformative learning,** networks and communities of practice
Cross-cutting		Seek alternative resources Build networks and partnerships Broaden the problem frame

The ways in which these are combined affects the way in which the niche influences the regime. According to Smith and Raven (2012), niches will either 'fit and confirm' (become competitive in unchanged selection environments) or 'stretch and transform' (change their selection environments to favour path breaking innovation).

This suggests that while different strategies can be used to scale out, up, or deep, no formula exists for their precise combination (Moore *et al.* 2015).

What is clear from the literature on niche scaling is that narratives and learning networks play a central role in the way that local level experimentation succeeds or fails to affect the wider

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systems in which they are embedded (Van der Bosch & Rotmans 2008; Goodman *et. al.* 2012; Moore *et al.* 2015).

2.1.7 *THE ROLE OF KNOWLEDGE NETWORKS IN TRANSITION PROCESSES*

Learning and knowledge brokerage are increasingly recognized as a fundamental component in the process of innovation and transition (Klerkx *et al.* 2009; Kilelu *et al.* 2011; Moore *et al.* 2015). In a review of the contribution that knowledge platforms make to agricultural innovation in emerging economy contexts, Kilelu et al. (2011, p31) suggest that there is a need to "shift attention to knowledge access and use as a starting point for innovation", going on so far as to suggest that in emerging economy contexts, an understanding of innovation support can be distilled to 'simply that of knowledge brokering'.

Connecting to the different types scaling that underpin large-scale systems shifts, Carlsson and Stankiewicz highlight the need to consider the spread of knowledge and competence (described in chapter 1.3) in enabling socio-technical change:

'Networks of agents interacting in a specific technology area under a particular institutional infrastructure to generate, diffuse and utilize technology. Technological systems are defined in terms of knowledge or competence flows rather than flows of ordinary goods and services. They consist of dynamic knowledge and competence networks (Carlsson and Stankiewicz, 1991, p. 111)*.*

Moore and Westley reiterate this from a socio-ecological innovation perspective. Their research argues that social networks with the ability to rapidly mobilise and transfer knowledge can play a key role in leading sustainable change a in human-ecological systems (such as the food system) (Moore & Westely 2011).

This emphasizes the centrality of the development and flow of *competence* in the transition process. In their book relating specifically to food system transformation, Goodman *et. al.* (2012, p.248) highlight the fact that 'network processes of knowledge transmission are the catalyst for expansion by horizontal replication'. In other words, horizontal (or peer to peer) knowledge networks are the means through which pioneer projects multiply their effect. This links directly to the notions of scaling deep and scaling out (Van der Bosch & Rotmans 2008; Moore *et al.* 2015). Westley *et al.* (2013) in their work on agency to affect change within complex socio-ecological systems also note that the power to effect change is typically an expression of the relationships between a number of actors.

Viewing systemic transitions from this networked perspective 'highlights more explicitly the importance not only of understanding the creation of technology, but also its *diffusion and utilization*' (Geels 2004, p898. Own emphasis). This emphasis on the networked nature of competence is shared by a range of pedagogical theorists (Hakkarainen *et al.* 2004; Moore & Westley 2011; Hakkarainen *et al.* 2013; Torre *et al.* 2016) including Goodyear and Carvalho (2013) who reason that:

'Competence, which is one way of describing the end goal for a learning process, rarely resides in the head of a learner. Rather a person's competence is usually entangled in, and dependent on, a set of social and physical relationships – such that an expansive view of competence includes that person's ability to assemble and hold together the entities needed for the task at hand.' (Goodyear and Carvalho 2013, p50)

In many instances, information technology and the global teleconnections it facilitates is changing the way learning networks work (Lorentzen 2008). Because, close-knit networks of like-minded actors can reduce innovation by circulating redundant knowledge, maintaining a diverse set of weak ties is important to effective innovation. It opens up new avenues for networks to cultivate weak ties with a diverse range of international knowledge resources that help networks achieve change in their local contexts (Lorentzen 2008).

Within agricultural education and extension, there is growing recognition for the contribution which well-structured networks of farmers, rural industry operators and experts can make to rural innovation (Gwandu *et al. 2014;* ASSAf 2017*;* Kelly *et al.* 2017). Reflecting on the Dutch experience with agricultural innovation, Klerkx, et al. stress the importance of these networks to ongoing systemic change and innovation. They highlight the significance of innovation brokers who emerge from within these networks, activating them and contributing to "the development of innovation agendas and radical and/or system innovations to meet future challenges, by performing foresight exercises and initiating innovation projects which bear a high risk of failure." These brokers were shown to be central in developing concepts which 'were initially regarded with suspicion and disbelief, but now have become viable new development strategies' (Klerkx *et al.* 2009, p20).

However, the fact that the most effective innovation brokers tend to be internal actors who emerge organically from within the community of an existing network (Klerkx *et al.* 2009) brings its own set of challenges. A study of Canadian educational innovation networks identified the time and stress load associated with maintaining innovation processes as one of the greatest barriers to the scaling of innovation, and hence systemic transitions. Reflecting on a multi-year change agents capacity building initiative two participants from this study noted:

'What we learned was how to develop a community of learning that in turn develops the growth and development of the networks we created.'

However,

'[the] question of stress and the capacity to manage the ambiguity and to inspire others to stay with you in the ambiguity, is a key capacity. And when we talk about key leadership challenges, it's certainly maintaining in oneself that capacity over time.' (Moore *et al.* 2015, p81)

Stepping back to consider youth in food system transitions in South and Southern Africa, a host of questions emerge from the findings of Geels (2004), Klerkx et al (2009), Moore *et al.* (2015) and others (Kilelu *et al.* 2011; Goodyear & Cavalho 2013; Ramos-Mejía *et al.* 2018). If youth are to participate in leading a transition in the food system then: What kind of scaling approaches will be most effective for them in this context? What kinds of knowledge and competencies do they require for this scaling? Where will the competencies required to underpin this transition come from? What kinds of windows of opportunity are presenting themselves to existing niche's at a landscape level? And, how should these processes (and the actors within them) be

supported?

The following sections of the literature review attempts to add some substance to these questions. It begins by exploring the need for food system transformation and food regimes in more detail in section 2.2 before moving on to consider the role of youth in section 2.3.

2.2 THE NEED FOR FOOD SYSTEM TRANSITIONS

For the majority of the world's population, eating is as much an act of cultural expression as it is an act of bodily sustenance. Meeting these changing dietary demands of an increasingly affluent and populous society within the ecological confines of our planet is one of the great challenges of our time (FAO 2017). The food system is the biggest driver of anthropocentric greenhouse gas emissions and biodiversity loss ((Meadows *et al.* 1972; Rockström *et al.* 2009; IPCC 2014). Yet despite its truly enormous ecological toll, the socio-political arrangements surrounding the food system are failing to deliver healthy diets to almost half the world's population (Patel 2007).

This section unpacks the notion of 'the food system' in more detail, and presents perspectives on the problems within this system as well as a range of perspectives on how to address these. Its broad geographic focus is interspersed with regionally specific insights into the peculiarities of South and Southern Africa.

2.2.1 THINKING SYSTEMICALLY

The important distinction between thinking about food systems, as opposed to a focus on food value chains, is that the former takes into account a much wider set of socio-ecological processes which extend well beyond the line of actions between production and consumption (Erickson 2008; IAASTD 2009; Ingram et al. 2012). Building on this, problem framing from a food system perspective tends to go beyond a relatively narrow framing of the food security challenges, to a wider discussion about wider social welfare and environmental security.

Erikson (2008) outlines a framework for studying the multiple interactions of broadly defined food systems in order to bridge social science and natural science perspectives. While many definitions of the food system exist, Erikson's provides a succinct synthesis of a disparate set of literature on food systems, food security, and global environmental change.

The systemic framework outlined by Erikson enables analysis of the various feedback loops within the food system. Specifically it delineates 'activities', 'outcomes' and 'drivers'.

The 'activities' describe what would typically be considered a food value chain - what does it take to get from farm to fork. While the outcomes consider what results from the way these activities are structured - does it make healthy food available to all? What kind of livelihoods does it support and in what numbers? And, what environmental consequences does it have? These then in turn affect and are affected by a set of social and ecological 'drivers'. (see Figure 2.4.).
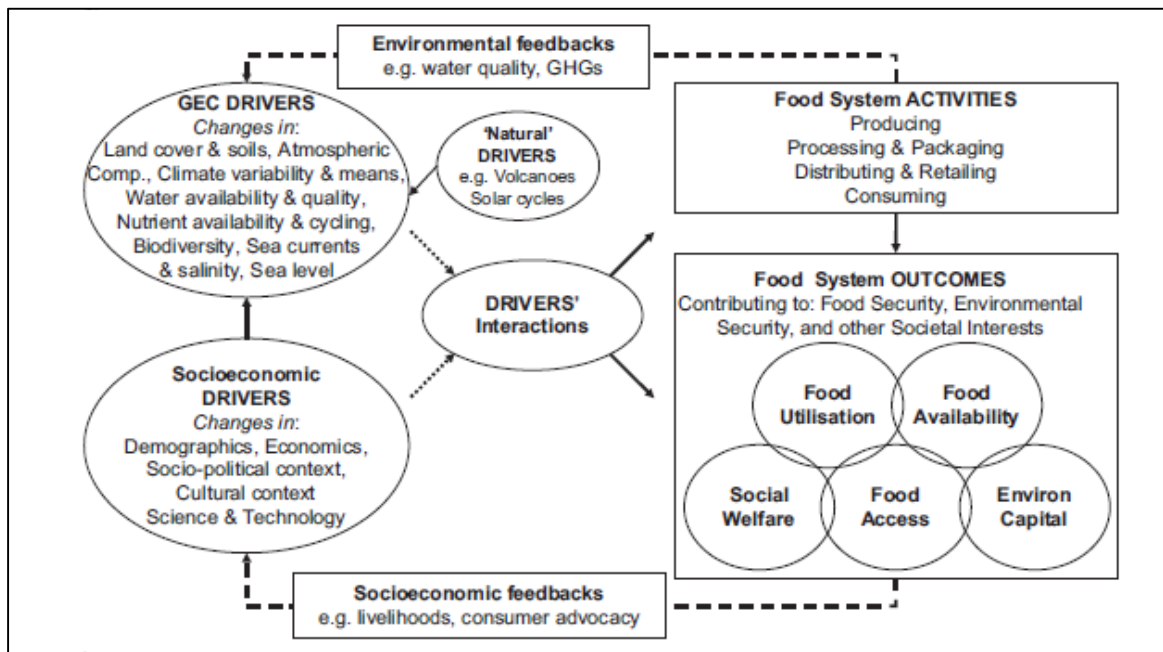
Figure 2.4: The food system and its drivers (Source: Erikson 2008).

This framing of the food system embraces a non-linear perspective that has parallels to Hollings (1987) adaptive cycle much of the SET theory which followed from it.

According to Erikson, 'to understand a system holistically it is necessary to describe and analyze not only the component parts and actors, but the interactions among these parts and actors that produce variable outcomes. A goal of the system's description is thus to explain the patterns of interactions among the activities, external drivers, and the outcomes, so as to fully assess any emergent properties, as well as cause and effect' (Erikson 2008, p243).

Keeping the questions of youth and unemployment that guide this research in mind, this systemic impression of the food system indicates the need to consider youth unemployment concurrently in three senses; Youth and questions of unemployment is an outcome, a feedback and driver within the food system.

One shortcoming of the Erikson framework in light of this research into transitions, is that while Erikson's framework provides a picture of the moving parts within the system, it says nothing of the degree of resilience within the system, nor potential levers of change. In this regard Schipanski et al's 2016 framework for thinking about food system resilience and transition provides a helpful complentary model. Figure 2.5 provides a conceptual model showing 'pathways that could shift current food systems (a) toward either a more degraded state (b) or toward a more social–ecologically sustainable state (c). The resistance of the current system to change can be shifted by destabilization or transformation 'wedges'' (Schipanski et al. 2016. P607) .

Destabilization wedges
1. Increased inequity and injustice
2. Environmental degradation
3. Exclusive reliance on global distribution networks
4. Homogenization of energy dense diets

Transformation wedges
5. Increased equity and justice
6. Biodiversity through agroecological mgmt
7. Increased diversity of distribution networks
8. Increased dietary diversity and reduced waste

Resilient system

Degraded food system
(low diversity, wasteful, reliant on externral inputs, food insecure, inequitable, lack of agency)

'Business-as-usual' food system

Transformational food system
(agrobiodiverse, regenerative, food secure, equitable & just)

Figure 2.5: Food system levers of postive and negative transition (Source: Schipanski et al. 2016).

2.2.2 PERVASIVE PICTURE OF SYSTEMIC DYSFUNCTION

Framing the questions around food in the form of a 'system' as outlined above, infers that it is the outcomes (for both people and planet), rather than the activities of the system on which the system should be evaluated. It also implies that these outcomes are not the result of some static natural order of things. Rather the outcomes from the food system are a modifiable result of the other two elements: value chain 'activities' and socio-ecological 'drivers'.

In considering these dynamic outcomes, it has been widely argued that a well-functioning food system would be one which exists within the fundamental ecological boundaries of the planet, while at the same time ensuring a safe and sufficient diet for all (Erikson 2008, Roberts 2008, Pinstrup-Andersen 2009). However, as Patel eloquently summarises, one in six people go hungry, yet one in four is overweight and for the first time in human history, tomorrow's generation is predicted to die younger because of today's food system (Patel 2007).

Similarly it has been unequivocally argued that the current global food system is exceeding the safe bio-physical operating limits of the planet (Meadows *et al.* 1972. Rockström *et al.* 2009). Agriculture is the biggest driver of terrestrial biodiversity loss globally and from a marine perspective, approximately 85% of the world's fish stocks are either overexploited or exploited to their maximum potential (FAO 2012a, 2012b). Agriculture is the second largest contributor to greenhouse gas emissions globally (24%), after the electricity and heat production sector (25%) (IPCC 2014). When related food processing, transport and preparation activities are added to this, the food system is the biggest contributor to greenhouse gas emissions.

Much of these environmental and social challenges are the outcomes of a major dietary transition being driven by corporatisation of the value chain, shifting consumer preferences, increased wealth and rapid urbanisation (Godfray et al. 2010 *et al.* 2010; Joubert 2012). With the increase in purchasing power and immersion into the types of food systems that typically accompany urban lifestyles, comes an increase in demand for resource-intensive foods such as

meat, dairy, fish and processed foods (Godfray et al. 2010 *et al.* 2010; Joubert 2012; FAO 2012b; Tschirley *et al.* 2015).

These highly processed and/or animal-based products place a greater ecological burden on the food systems that produce them than the predominantly plant-based diets they are replacing (Baroni et al. 2007, Godfray et al. 2010 et al. 2010) and carry significant health implications for society at large. Globally, by 2020 'chronic non-communicable diseases will be responsible for two-thirds of all premature deaths and years lived in less than optimal health. And most of these will be "strongly associated with diet"' (Joubert 2012, p148).

'In low-income, largely rural Uganda, for example, consumption of highly processed foods now accounts for 19 percent of the value of food purchases, while in high-income, highly urbanized South Africa that figure increases to 55 percent' (Kabasha *et al.* 2015, p192).

The prevalence of highly processed foods contributes to South Africa's obesity epidemic. Based on body mass index scores 68% of women, and 31% of men over the age of 15 are overweight or obese in South Africa (SADHS 2016). Yet, despite apparently high levels of over-consumption nationally, between 14% and 52% of households are moderately to severely food insecure, depending on the metrics used (Joubert 2012). One in three boys under the age of five is stunted, and among girls, the ratio is one in four girls (SADHS 2016).

It is important to highlight that poor food system outcomes relating to diet-based wellbeing are not restricted to low-income demographics. In a recent study of over 13 000 white collar workers in South Africa, of whom the majority are professionals and managers, more than 63% were either overweight or obese and 82% fell below the recommended daily intake of fresh fruit and vegetables (Discovery 2011).

In South Africa, it's not just consumers and the environment which are being negatively affected by some of the outcomes of the food system. In spite of the fact that agricultural revenue has grown by around 70% since 1996(BFAP 2013), the number of commercial farming units dropped from 60 900 to 39 900 in 2007. Between 2001 and 2016 corresponding employment in the sector dropped by 30% from 969,000 to 681,899 (Bhorat & Khan 2018). This decline in employment has taken place in spite of year on year growth of 1.9 percent per annum in the sector over the same period. As further evidence of the consolidation of profit in the sector, wage Gini Coefficients for the agricultural sector also rose during this period. Between 1995 and 2014 wage inequality in agriculture rose by 43% (Boraht & Khan 2018). And, of the current total number of commercial farms, only 1.5% (673) account for a third of total gross commercial farm income (DAFF 2013, Bernstein 2013). In the food retail sector the market share of the major retail chains has risen from below 10% in the late 1980s to around 68% in 2012 (Reardon *et al*. 2003, Bernstein 2013). Similar trends exist across the food system, from milling to finance and fertilizers (Metelerkamp 2014). This suggests a systemic transformation in the way that power and profit are distributed across the food system (Wilkinson & Pickett 2009, Greenberg 2015).

Based on these outcomes, the food system, and the South African food system in particular, while it may be working for some, is considered to exist in a state of increasing dysfunction. The reasons for the persistence systemic dysfunction in South Africa are complex and interrelated, and span environmental, health, economic, sociopolitical, and agro-food sector challenges (Pereira & Drimie 2016).

2.2.3 PERSPECTIVES ON DESIRED TRANSITIONS

While the need for systemic change is widely acknowledged, there are a wide range of divergent views on what the real problems are and what exactly needs to change (Pereira and Drimie 2016). Holt-Giménez and Shattuck's (2011) theory of the four distinctive movements found within food systems discourse provide a useful framework for the categorisation of various perspectives on the need for change. These are briefly explained below and summarized in Table 2.2:

Neoliberal movement: This is the dominant trend within the corporate food system regime. It is characterised by economic liberal principles and is market-based, driven by agri-food monopolies, and managed by institutions such as the World Trade Organization and the United States Department of Agriculture.

Reformist movement: This mirrors the neoliberal trend in calling for reproduction of the corporate food regime, even though it is subordinate in terms of power in the system . It differs from the above in that it does advocate for certain reforms, including an increase in social safety nets and consumer-driven niche markets. But the movement is still driven by corporate interests, big philanthropy and capitalist-led governments.

Progressive movement: This is characterised by the promotion of practical alternatives to industrial agri-foods; for example, sustainable, agro-ecological and organic agricultural practices coupled with calls for the right to food and food justice for marginalised groups.

Radical movement: This calls for radical food systems change focused on structural reforms to markets and property regimes, entitlements, and food sovereignty, which is described as class-based redistribution of land, water and resources.

Table 2.2 A food regime/food movements framework (Source: Holt-Giménez & Shattuck 2011)

POLITICS	Corporate food regime		Food movements	
	NEOLIBERAL	REFORMIST	PROGRESSIVE	RADICAL
Discourse	*Food Enterprise*	*Food Security*	*Food Justice*	*Food Sovereignty*
Main Institutions	International Finance Corporation (World Bank); IMF; WTO; USDA; USAID; GAFSP; Green Revolution/CGIAR; Millennium Challenge; Global Harvest; Bill and Melinda Gates Foundation; Cargill; Monsanto; ADM; Tyson; Carrefour; Tesco; Wal-Mart	International Bank for Reconstruction and Development (World Bank); FAO; HLTF; CFA; CGIAR; IFAP; mainstream Fair Trade; Slow Food; some Food Policy Councils; Worldwatch; OXFAM-AMERICA; CARE; Feeding America and most food banks and food aid programs	CFS; Alternative Fair Trade & many Slow Foods chapters; many organizations in the Community Food Security Movement; CSAs; many Food Policy Councils & youth food and justice movements; Coalition of Immokalee Workers and other farmworker & labor organizations	Via Campesina and other agrarian-based farmers' movements (ROPPA, EAFF, ESAFF); International Planning Committee on Food Sovereignty; ATTAC; World March of Women; and many Food Justice and rights-based movements
Orientation	*Corporate/Global market*	*Development/Aid*	*Empowerment*	*Entitlement/Redistribution*
Model	Overproduction; corporate concentration; unregulated markets and monopolies; monocultures (including organic); GMOs; agrofuels; mass global consumption of industrial food; phasing out of peasant & family agriculture and local retail	Mainstreaming/certification of niche markets (e.g. organic, fair, local, sustainable); maintaining northern agricultural subsidies; 'sustainable' roundtables for agrofuels, soy, forest products, etc; market-led land reform; microcredit	Agroecologically-produced local food; investment in underserved communities; new business models and community benefit packages for production, processing & retail; better wages for ag. workers; solidarity economies; land access; regulated markets & supply	Dismantle corporate agri-foods monopoly power; parity; redistributive land reform; community rights to water & seed; regionally-based food systems; democratization of food system; sustainable livelihoods; protection from dumping/overproduction; revival of agroecologically-managed peasant agriculture to distribute wealth and cool the planet
Approach to the food crisis	Increased industrial production; unregulated corporate monopolies; land grabs; expansion of GMOs; public-private partnerships; liberal markets; microenterprise; international sourced food aid; GAFSPF – The Global Agriculture and Food Security Program	Same as neoliberal but with increased middle peasant production & some locally-sourced food aid; microcredit; more agricultural aid, but tied to GMOs & 'bio-fortified/climate-resistant' crops; *Comprehensive Framework for Action* (CFA)	Right to food; better safety nets; sustainably produced, locally sourced food; agroecologically-based agricultural development; Committee on World Food Security (CFS)	Human right to food; locally sourced, sustainably produced, culturally appropriate, democratically controlled; focus on UN/FAO negotiations
Key documents	World Bank 2008 Development Report	World Bank 2008 Development Report	IAASTD	Declaration of Nyelení; Peoples' comprehensive framework for action to eradicate hunger; ICAARD; UN Declaration of Peasant Rights; IAASTD

From the perspective of youth un/employment, the nature and number of jobs available in agriculture and related food value chains under each of the four perspectives outlined above will differ markedly. And, hence, from an educational perspective, so too will the types of competencies youth require to enter jobs in each of the four perspectives.

For example, a neoliberal agricultural environment will require a dwindling contingent of relatively unskilled labour who are managed by a small number of highly qualified technical staff - at a ratio of around 9:1 respectively (Minde *et. al.* 2015). The ability to fit into large financially incentivised hierarchical structures will be an important competency. The scenario envisaged by the radical movement, on the other hand, would require that a large number of (predominantly) rural families are able to operate with a moderate to high level of farming and small business acumen. All actors within the system would need to be intrinsically self-motivated by a mix of social, ecological and financial factors.

While it is reasonable to assume that any future will comprise of a mix of all four of these perspectives, the proportions of this mix and the way trade-offs are negotiated will be what matters. In considering a blend in which labour small-scale farming can be meaningfully

mainstreamed without excessive destabilization of the most important pillars of the existing large-scale agricultural sector (and the jobs it supports) Cousin's for example, suggests that the top 20 percent of farms should in fact be exempt from land reform for medium term (Cousins 2016). The intention of this research, is to bring youth voices into the literature that informs the way these tradeoffs are negotiated.

Given the unprecedented wave of youth expected to enter the labour market in coming decades, these structural differences in employment opportunity are an important issue for the futures of youth across Africa (IFAD 2014 in Tschirley *et al.* 2015). In considering this issue, the Regional Network of Agricultural Policy Research Institutes in East and Southern Africa (ReNAPRI, 2014) argues that there are two major criteria that need to be taken into account when considering the planning of Africa's agricultural future. Firstly, considering carefully which type of farm structure can provide the greatest number of jobs well above the poverty line. And, secondly, which type of farm structure will provide the greatest number of indirect employment benefits through growth multipliers.

ReNAPRI notes that "w*hile small-scale African agriculture has generally not thrived, it is important not to confuse missed opportunities with inherent lack of viability. Asia's "green revolutions" were powered by small-scale farms and provide hope for what Africa might achieve with similarly supportive policies and public expenditures." (*ReNAPRI, 2014; p3.). While the argument has been clearly made that in many ways the 'green revolutions' across Asia have not been nearly as successful as ReNAPRI may be holding them up to be, particularly when considered from a long-term ecological sustainability perspective (Patel, 2007. Holt-Giménez & Altieri 2013, Shiva 2016), the very same (if not greater) ecological pitfalls apply to the roll out of large scale commercial agriculture in Africa.

ReNAPRI goes on to argue that '*most types of large-scale agricultural production are capable of absorbing an exceedingly small fraction of the rural labor force (there are exceptions such as for sugarcane and horticultural crops), and unskilled farm labor in most cases pays very little above poverty-line wages'* ReNAPRI 2014, p3.).

In weighing up these options, ReNAPRI's second point around growth multiplication is equally important - with an important caveat: Growth for who?

While South Africa's agricultural sector has been growing at around 2% per annum under the post-1994 neoliberal arrangement, this growth has benefited an increasingly small number of very wealthy agri-business owners while shedding low-income labourers (Bhorat & Khan 2018). Conversely, the bottom-up development of small-scale farmers, particularly investments targeting gender equity and female headed households, has been widely shown to have wide multiplier effects on rural development and poverty alleviation (Mellor 1976; Mellor 1999, Pretty & Hine 2001, Jayne *et al.* 2003; Anríquez, & Stamoulis 2007; Aliber & Hall 2012, Patel *et al.* 2015).

The motivation for, as well as steps towards achieving, these bottom-up approaches in the South African context are captured in the literature on 'accumulation from below' in the following section 2.2.4. The principles of accumulation from below classify loosely with the progressive and radical movements identified by Holt-Giménez & Shattuck (2011).

2.2.4 ACCUMULATION FROM BELOW

In considering the increasing consolidation of power and profit within large-scale commercial agri-food value chains in the global south, an emerging body of research drawing on Marxist theory points to the need to consider and re-examine agricultural and rural development strategies based on broad based accumulation of capital from below (Neocosmos 1993, Cousins 2007, 2013, 2015). Marxist theory sets up two forms of agrarian accumulation under capitalism: Accumulation from above, and accumulation from below (Neocosmos 1993). In the former, existing 'elites' control the majority of the agricultural production system and expand their wealth based on wage labour of the rural poor (reflected in the situation described in the first paragraph of this section). In the latter, rural small-scale farming families succeed in producing regular food surpluses which they are able to sell for a profit in order to re-invest into expanding their means of production (both materially and socially). This ability to incrementally expand production leads to a redistributive accumulation of capital among much larger numbers of poor and working class people - this is accumulation from below.
In South Africa, the concept of small-scale or smallholder farmer is value laden (racially and economically). Notions of what constitute a small farm are also completely dependant on ecological context (Kirsten & van Zyl. 1998). The widespread use of terms such as 'smallholder farmer' and 'small-scale farmer' in South Africa are therefore problematic because they 'obscure inequalities differences within the large population of households engaged in agricultural production on a relatively small scale' (Cousins 2011, p10).

In contributing to the discussion around accumulation from below, Cousin's classifies South African, black, 'small' farmers into the categories presented in Table 2.3.

Table 2.3 : Typology of smallholder farmers (Source: Cousins 2013)

	Subsistence-orientated smallholders	Market-orientated smallholders in loose value chains	Market-orientated smallholders in tight value chains	Small-scale black capitalist farmers
Objective of production	Household consumption of additional food	Household consumption + cash income	Cash income + some home consumption	Profit
Proportion of marketed output	None or insignificant	50% or >	75% or >	100%
Contribution to household income	Reduces expenditure on food	Variable – from small to significant	Significant	Significant
Labour	Family	Family + some hired	Family + significant numbers hired	Hired
Mechanisation	Very low	Low	Medium to high	High
Capital intensity	Very low	Low	Medium to high	High
Access to finance	Absent	Some	Significant	Very significant
Numbers in South Africa (households)	2-2.5 million	200-250 000	5-10 000?	5-10 000?

In considering a policy classification of small farmers with respect to governmental support, Kirsten and van Zyl define a small farmer as 'one whose operation is too small to attract the services he/she needs to be able to significantly increase his/her productivity'. Taking the above into consideration, this thesis uses the term small-scale farming to mean:

Farming at a scale below the norms of mainstream commercial agriculture within a given context, with objective of producing for household consumption, financial income or a mix of both.

Success for this group is defined by several authors as a state characterised by high levels of productivity and access to markets resulting in sufficient cash income for the farmer to enjoy a life free from poverty (Koranteng 2010).

Formulating strategies to support bottom-up agrarian reform is the antithesis of free-market 'trickle-down' developmental economics. Linking back to Holt-Gimenez and Shuttuck's four distinctive movements, the types of class based reform which underpin calls for accumulation from below tend towards the Progressive or Radical movements.

Hall (2009), Aliber & Hall (2012) and Cousins (2007, 2010, 2103) stress that this modest but broad accumulation of wealth (and power) is the agricultural strategy best suited to improving food system outcomes and turning the tide on poverty and rising inequality. Collectively these authors point towards a potential future in which the 200,000 - 250,000 black small and medium scale commercial farmers along with some of the more established and commercially orientated portion of South Africa's four million semi-subsistence farmers, could incrementally

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expand production resulting in the emergence of a vibrant small and medium scale farming sector. Cousins (2010) refers to this as the 'missing middle' between huge commercial farms and tiny food security gardens.

2.2.5 INFORMALITY AND SURVIVAL - FOOD NETWORKS IN URBAN AREAS

While calls for accumulation from below are a predominantly rural phenomenon, comparable literature on alternative pathways for navigating food and livelihoods for the 63% of South Africa's living in urban areas (DCGTA 2016) also warrant attention.
Across Africa the informal sector is responsible for 85% of all livelihoods (ILO 2018). In South Africa, the informal economy is central the livelihood strategies of the urban poor and to a lesser extent middle classes (SFL 2016a, SFL 2016b, Battersby, Marshak & Mngqibisa 2017). It is estimated that the informal economy employs around 3.7 million people, accounting for one third of all jobs in South Africa (Valodia 2007, Wills 2009). In South Africa estimates suggest that Spaza shops and food hawkers accounted for 735,000 jobs alone (Greenberg 2015).

Food-based enterprises form the majority of this. The Sustainable Livelihoods Foundation in their assessment of 10 842 thousand township enterprises across South Africa found that food and drink related enterprises accounted for 54% of all township enterprises (SFL 2016a).
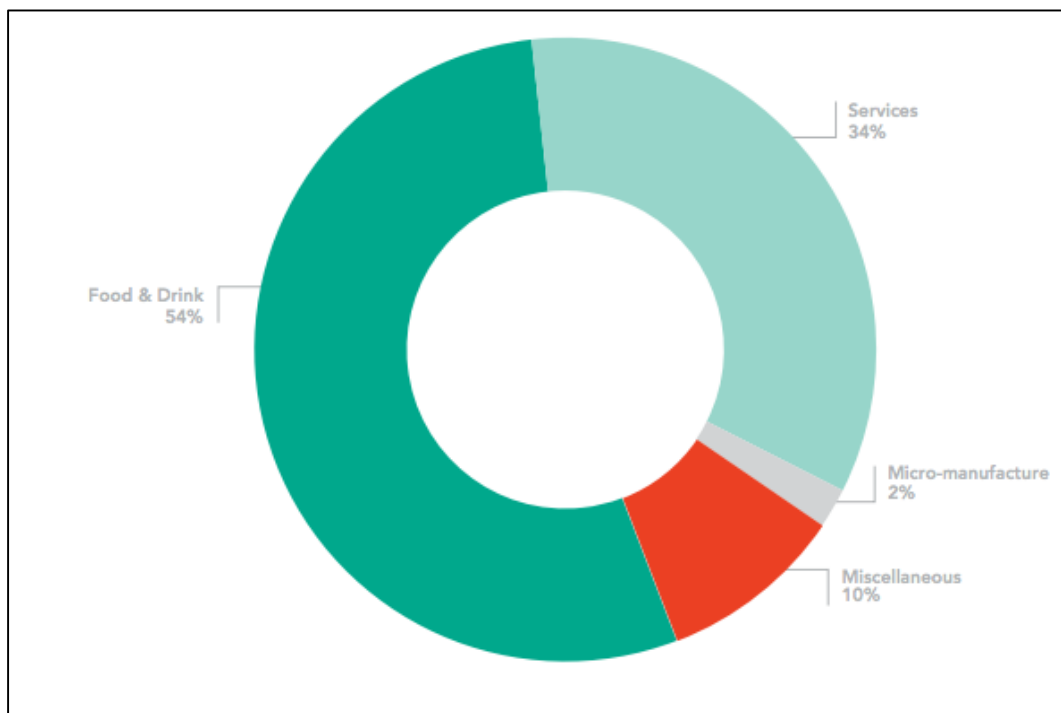
Figure 2.6 The percentage distribution of sectors across all sites (Source: SFL 2016a).

These data are consistent with employment data from elsewhere in South and Southern Africa (Tschirley et. al. 2015, Battersby, Marshak & Mngqibisa 2017). What the data on the informal food economy emphasizes is that the centrality of the food system to questions of employment and poverty are not a rural phenomenon. While the kinds of jobs reflected in the food system

may vary substantially between urban and rural areas, the food system remains central to how many of the most vulnerable in South Africa make ends meet. However, contrary to the perception of the informal food economy as an option of last resort when the formal system fails, over 75% of all respondents in the SLF's survey stated that they preferred owning an informal business to a retail job at R128 per day (SLF 2017b).

Given the inability of the formal economy to absorb youth into dignified employment, the informal food system is socially and economically significant to South Africa's development trajectory.

However, opportunities in the informal economy notwithstanding, the majority of South Africa's urban population is food and nutritionally insecure (Frayne *et al.* 2009). At a city-level some studies have reported food insecurity levels as high as 89% in some townships (Battersby 2010). In navigating this pervasive insecurity fluid networks of reciprocity and exchange exist at a community-level. These networks form a critical survival strategy of the urban food insecure through enabling food access and complimenting intake (Haysom 2016).

Connecting these networks to questions of employment, Haysom notes:

While there are multiple causal drivers that prompt the activation of such networks, poverty and the inability to access the livelihoods necessary to afford even a basic food plate (and not a nutritious food plate), mean that such networks are indicators of livelihood failure.

It may also be that these the informal food trade and the networks that underpin them, provide an opportunity for small-farmer integration into food retail opportunities[3].

2.2.6 *ALTERNATIVE FOOD NETWORKS*

Writing from a northern perspective, Goodman and Goodman (2009) describe alternative food networks (AFNs) as:

'New and rapidly mainstreaming spaces in the food economy defined by – among other things— the explosion of organic, Fair Trade, and local, quality, and premium specialty foods. In these

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[3] For further reading on this see:

Brown, K., Bacq, S. & Charman, A. 2018. *Supermarkets, Informal Micro-Enterprises And Household Consumption*. Sustainable Livelihoods Foundation / Center For Excellence In Food Security: Cape Town

Thow et al (2017) 'Food trade and investment in South Africa: Improving coherence between economic policy, nutrition and food security', Working Paper 50. PLAAS, UWC: Cape Town.

Sanders et al. (nd) *At The Bottom Of The Food Chain: Small Operators Versus Multinational Corporations In The Food Systems Of Brazil, Mexico And South Africa*. Economic Justice Network: Cape Town

networks, it is claimed that the production and consumption of food are more closely tied together spatially, economically, and socially.' – (Goodman and Goodman 2009, p1)

In many instances these AFNs reflect Geel's description of a niche: locations of innovation within which small networks of actors support novelties (social, ecological or technological) on the basis of experimentation and shared visions (Geels 2012; Geels and Schot 2007).

Based on his assessment of survival networks among the urban food-insecure in South Africa (mentioned in the section 2.2.5), Haysom is critical of the notion of sustainability oriented alternative food networks in the global south. He asserts they are representative of 'idealistic', 'middle-class angst' existing in the imaginations of the middle class South Africans (Haysom 2016, p13). This perspective on alternative food networks suggests these experiments with alternative approaches stems from a middle class ignorance or disregard for the daily struggles of the marginalized. Goodman and Goodman (2009) also draw attention to the somewhat elitist nature of these networks, citing 'weak politicization' and the neglect of social justice concerns as a key failing of contemporary AFNs in North America and Europe.

More favourable interpretations suggest that AFNs can break away from conservative localism to cultivate a spatially grounded ethic of care. This ethic, they argue, seeks to construct 'spaces and places of fair trade' imbued with the 'imagined and material connections between knowing consumers and distant 'others'' (Goodman and Goodman 2009, p6)

Others take this a step further suggesting that the languages and ideologies of food sovereignty and agroecology underpinning some of these networks were born out of the class struggles of the poor in the global south (Sage 2014).

In South Africa, the truth may lie somewhere in the middle.

The organic sector as a whole appears to be growing in South Africa, although currently demand outstrips stable supply (Kelly & Metelerkamp 2015). Middle class consumers in urban centres as well as limited exports are leading this demand. Among these consumers the purchasing preference for organics (and other similar sustainability/ethical labelling) is motivated by a mix three primary concerns: personal health, the desire to support small and emerging farmers, and concern for the environment (Engel 2008). However, because small-scale farmers struggle to fit into the mainstream retail system, the emergence of an organic produce economy that incorporates small producers has been co-dependant on the rise of alternative retail structures capable of servicing these demands. A number of these, including Ethical Coop/Organic Zone, and Siyavuna, explicitly act as bridging organisations between class divides in South Africa, linking organic pioneers and emerging black farmers to urban middle class consumers willing to pay a premium for what they see as ethically produced food (Kelly & Metelerkamp 2015).

Seen from an MLP perspective, elitist concerns for food quality that translate into a willingness to pay more for 'good food' create a shielded environment. In this space, small farmers, processors and retailers are afforded some level of market protection as they carry the costs and risks associated with systemic experimentation and innovation. Given the predatory nature of the formal retail sector (SLF 2016b), the high levels of corporate consolidation along the food value chain (Bernstein 2013, Haysom 2016) and the collapse of the state agricultural support services (Aliber & Hall 2012) the question needs to asked about how else can safe spaces for potentially transformative food system innovation be created in South Africa?

2.2.7. ECOLOGICAL IMPARATIVE FOR CHANCE

Despite the dependence of all people on the life-giving properties of planet's ecosystems, almost all of the world's major ecosystems have either been irreparably damaged or are in a state of decline as a direct result of human activity – particularly agriculture (MA, 2005; UNEP, 2009). As agriculture uses over a quarter of the Earth's land surface and at least 20 percent of all water running off the land, the way in which humanity produces its food has a disproportionately large impact on the ecological health of the planet (MA, 2005). This suggests that ecological reform in agricultural is imperative if current trends in ecosystem degradation are to be reversed (UNEP, 2009).

United Nations estimates suggest that in order to meet food demands in 2030, 120 million hectares (Mha) of additional farmland will need to be opened up, much of which will come from existing natural forests and savanas. While this is a shockingly large figure, the tragic irony is that since 1990 120Mha of agricultural land has undergone some form of degradation (Scherr, 1999 in Swilling & Annecke, 2012). In other words we have damaged and destroyed as much soil in the last 20 years as is now beingrequired from previously untouched natural areas over the next 20. Due to its relative abundance of agricultural land, the high incidence of soil degradation and burgeoning population, Africa sits at the epicentre of this unfolding global landuse shift.

Declining soil health also plays a big role in the cost of producing food, as degraded soils produce less relative to the inputs applied to them (Pretty, 1999; UNEP, 2009). Degraded soils require more inputs (and thus costs) in relation to their healthy counterparts in order to deliver equal yields (Scherr, 1999; Lal, 2006). As a result of mismanagement by both small and large scale farmers, one-third of all the world's agricultural land is either moderately or severely degraded (IAASTD, 2009) and this figure is growing at 0.2 percent per annum (UNEP, 2009). The main forms of degradation are the loss of topsoil from wind and water erosion, salination, acidification, nutrient depletion and declining soil structure leading to crusting and compaction (Lal, 2006).

The reasons for this are complex and vary greatly from one region to another. In developing countries, erosion, nutrient depletion and salination are the main drivers of soil degradation. These are largely economically driven, as farmers are pressured into over-grazing and struggle to afford the inputs required to replace nutrients extracted from their soils (Pretty, 1999; UNEP, 2009). In developed countries wind and water erosion are also prominent (IAASTD, 2009), as is eutrophication and soil acidification as a result of agricultural intensification and the disruption of mixed crop-livestock systems (FAO, 2009a). All of these also result in a loss of organic and living matter in agricultural soils which is increasingly being recognised as an important form of soil degradation and green house gas emissions (Scherr, 1999).

Beyond soils, a number of authors argue that there are other forms of natural agricultural capital that are being degraded by widely accepted agricultural practices which also result in the need to increasingly apply external inputs (Conway, 1997; Pretty, 2006; Magdoff, 2007). By cultivating large areas of monocropped agriculture, farmers reduce the biological diversity on

their farms. Conway (1997) states that this loss of biodiversity increases the need for external inputs to replace the ecosystem services which this biodiversity previously supported. Conway notes that increased loss of on-farm biodiversity and the increasing use of pesticides which has accompanied this loss are resulting in growing pest problems as pests adapt to external control measures while the natural pest control mechanisms are inadvertently removed from the system (Conway, 1997). He states: "The move towards large areas of monoculture has been one of the reasons why pest and disease outbreaks have grown in the wake of the Green Revolution" (Conway, 1997: 115).

In summary, ecological degradation is on the increase, and while it may not result in lower aggregate world food production in the next decade it will continue to reduce the total factor productivity (TFP)4 of the food system as more inputs are required to compensate for this loss of natural capital (Scherr, 1999, FAO, 2009). It is likely to result in higher production costs per unit produced, lower farm incomes and higher consumer food prices (Scherr, 1999, FAO, 2009). This will impact the poor the most, as farmers are forced to pass on the double burden of increased input requirements and input costs to those buying their products (Scherr, 1999; UNEP, 2009).

2.2.8. IMPLICATIONS FOR TRANSITIONS IN THE SOUTH AFRICAN FOOD SYSTEM

There is clearly a need for change in the way the food system currently operates. The literature presented here suggests that this needs to be ecologically sustainable, to recognise the importance of the informal food economy and to focus on the principles of accumulation from below.

 However, unlike experiences in progressive northern context, such as the Netherlands where food and agricultural innovation is a coordinated and centrally supported national priority (Klerkx 2009, Candel & Pereira 2017), innovation in South Africa requires alternative approaches. To succeed, these approaches need to be outside the influence of the corporatized food system and independent of state support. This presents a very real challenge about who drives transformative innovation and, as equally important, who pays for it. Thus, while elitist concerns for the food system can never transform it, an opportunity may exist to leverage their capital to fund system innovation in emerging economies. This would require strategic oversight and guidance by food system activists to ensure that elitist ideals align with worthwhile funding gaps in the food system.

4TFP is the total output from a farm in relation to the total inputs to the farm. It provides a more comprehensive measurement of the efficiency of agriculture as it captures change in inputs required to achieve reported yields.

2.3 YOUTH INCLUSION AND EMPLOYMENT AS A LENS ON FOOD SYSTEM TRANSITIONS

2.3.1 YOUTH AT THE HELM OF THE FOOD SYSTEM TRANSITION - FOR BETTER OR WORSE

Given the nature and stage of the demographic transition underway in Africa, youth are going to be the creators, beneficiaries and users of the food system more than anywhere else in the world. As Africa's demographic bubble expands, the attitudes of Africa's youth towards the food system in the next decade are likely to have far reaching socio-ecological ripple effects out across the planet for many centuries to come.

The importance of early stage behaviour setting is something which has been extensively researched in marketing and behavioural studies, and from a food systems perspective is a large part of the reason why food marketers focus so heavily on advertising to children and teenagers (Story & French 2004; Nestle 2006; Robinson 2012). Behavioural patterns that are set during childhood are hard to change and likely to remain entrenched for life (Calvert 2008). Similarly, dietary patterns and many of the human body's metabolic processes are set in early childhood. Undernourishment in the early stages of life for example, increases the risk of being overweight as an adult (Horton 2008; Du Plessis 2013).

Similarly however, young people in general tend to be more receptive to change and new ideas and more willing to take risks (Bartholomew 1982, Park & Reuter-Lorenz 2009). Metelerkamp (2011) suggests that in agricultural systems for example, the most rapid changes in farm management practices tend to occur during the generational hand over between father and son.

Considering the food system, this presents both an opportunity and a threat. An opportunity in the sense that the Africa's demographic bubble presents a window of opportunity for more radical innovation and transition than may be possible in other regions with ageing populations. Yet, as youth aspire to change which includes 'modern' diets, the converse is true in that there may be a level of systemic vulnerability towards an accelerated shift in an increasingly unsustainable direction.

2.3.2 YOUTH UNEMPLOYMENT AND THE AGRI-FOOD SYSTEM

Given that 800 million African youth will enter the workforce over the next 40 years, the youth employment question is of critical importance. The International Labour Organisation notes that 'The challenge of youth employment is intricately embedded in the complexity of Africa's transformation' (Losch 2016 p1). The agri-food system (AFS), most notably the agricultural sector, plays a lead role in the employment landscape on the continent with some analyses suggesting that the AFS's contribution to employment is as high as 80% for much of the continent. South Africa is a clear outlier with the AFS contributing only 28% of all jobs, roughly half of which were in primary production (Tschirley *et al.* 2015, Losch 2016). As Holt-Giménez and Shattuck's (2011) framing of the four food movements demonstrates, visions for the future of agricultral are contested (see section 2.2.3).

Youth unemployment is a structural issue and responses need to mirror this (Losch 2016). As African economies and the agricultural sector modernises along current western models of development (typically pursuing labour reducing strategies through consolidation

mechanisation) Tschirley *et al.* (2015) raise attention to '*the specter of jobless growth'* and pose the question: 'where will the hundreds of millions of youth, many of them born into farming families, find remunerative employment?' (Tschirley *et al* 2015. P103)

While total employment in the South African AFS is considerably lower than much of the rest of the region, the focus on youth when considering food system transitions remains important. Young people (aged 15-34) constitute 37% of the country's population (StatsSA 2014). With unemployment rates among youth in South Africa at around 50% (of which about 60% have never been employed) and higher than any other age category (see Figure 2.7), there is a clear need to better understand how additional jobs could be brought onto the market through restructuring the food system, in order to meet multiple social, economic and environmental challenges simultaneously (Spaul 2013, Yu 2013). This could include finding ways to increase employment intensity of existing sectors as well as the development of new sectors in the formal and informal food economies capable of stimulating job creation in a green economy.
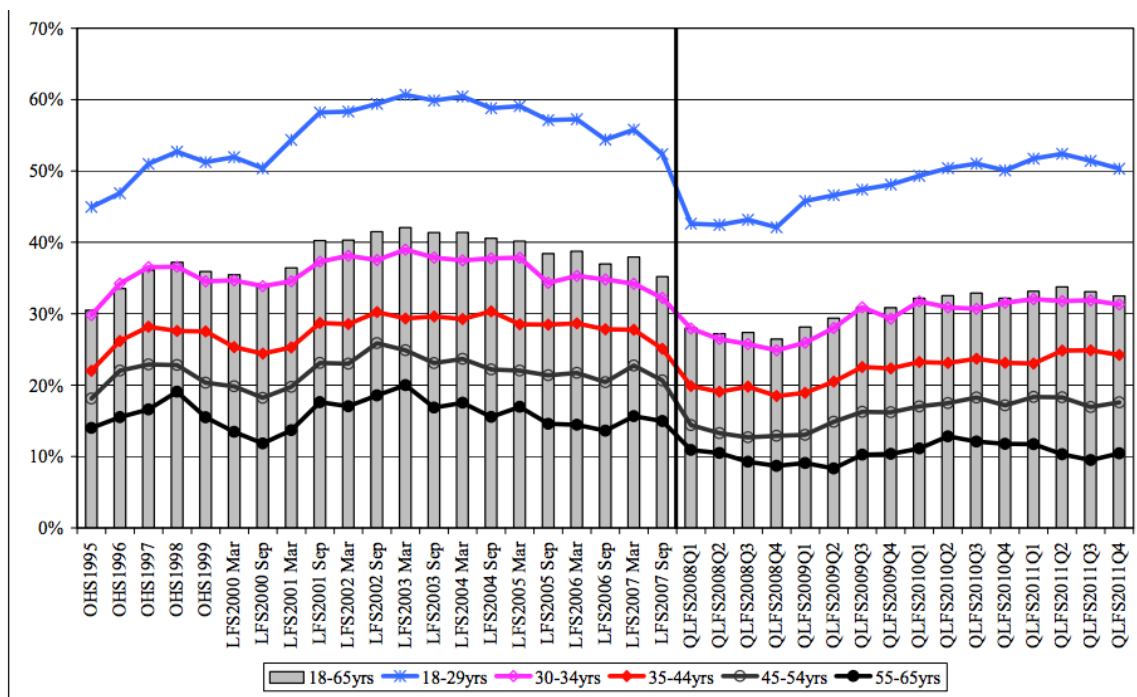
Figure 2.7: Broad unemployment rates in each age, 1995 - 2011(Source: Yu 2013).

Examples of such shifts could be a move towards increasingly organic production practises which tend to be input efficient but labour intensive (Pretty 2006), or shifting processing, logistics and retail functions of the food system out of centralised ownership into more distributed forms of ownership and control which share existing profits more equitably across a wider segment of society. It could also include the development of new jobs into sectors of the local food economy where proven demand exists for products like organic fresh produce for local and export markets (Kelly & Metelerkamp 2015).

2.3.3 ENGAGING YOUTH IN FOOD SYSTEM INNOVATION

This process of innovation and transition might also be an opportunity to incentivise youth to re-engage with the food system as an attractive career opportunity. What if, for example, being a

21st century farmer did not mean living in a way that was disconnected from the city? Or if being involved in agriculture and food value chains was seen as a creative and entrepreneurial activity which not only paid better than other options available but also contributed to building sustainable communities?

However, as White (2012), Swarts and Aliber (2013) and others have pointed out, conventional opinion points to somewhat of a confounding situation in which youth are turning their backs on jobs in agriculture despite high levels of unemployment. According to White, this apparent contradiction may stem from the way the problem has been studied in the past. He suggests that:

 "A youth studies perspective [can help] us to understand the lives of young people and their paradoxical turn away from farming in this era of mass rural unemployment and underemployment; it also provides a reminder of the need and the right of young people to be properly researched – not as objects, but as subjects and where possible as participants in research. " (White, 2012, p9).

It is also important to consider that while many youth may be turning their backs on agriculture in favour of urban livelihoods, much of the growth in the young populations of the 21st century will be born in cities who are first or second generation urbanites with very little experience of rural life (UN DESA 2018).

Given the relational dynamic between youth unemployment, social inequality and the changes within the food system, there is a need to better understand how young people might be inspired and supported to lead a just transition in the food system. While not explicitly linked to youth, examples of similar socio-technical leap-frogging in telecommunications and financial services in the region provide an example of the appetite for innovation that deals with everyday problems.

This should not simply involve the development of a policy discourse, which effectively expects youth to pick up and run with a new sort of 'do it yourself' solution to their own unemployment in which youth-led entrepreneurship is seen as a silver bullet to what are in fact structural defects in a neoliberal economy (NYDA 2015). Both White (2012) and the NYDA (2015) go on to stress the need for those seeking to address youth issues from the 'outside' to reflect critically on the expectations they place on youth. '[Youth] certainly do not (and should not) see themselves as 'human capital', that is, as beings in which the adult world invests, in order to derive some benefits from them in the future.' (White, 2012, p10). This sentiment is echoed by South Africa's National Youth Policy (NYDA 2015).

2.3.4 *CHANGING FOOD REGIMES WILL SHIFT EMPLOYMENT DYNAMICS*

It is also important to recognise that as the wider food regime transition unfolds across the region, the nature of employment opportunities for young people within the food system is also going to change considerably (Minde *et al.* 2015., Kaneene *et al.* 2015. Tschirley *et al.* 2015). The projections presented by Tschirley *et al.* (2015) in Table 1 suggests that while jobs in the agro-food sector are currently responsible for 80% of all jobs in the region (of which agriculture

currently accounts for 93%), this share is likely to decrease over time, although in absolute terms it will increase significantly.

Table 2.4: Evolution of job structure in East and Southern Africa, 2010-2025 (Source: Tschirley *et al.* 2015).

Category	Jobs in 2010 Number ('000)	Share	Number ('000) Scenario A	Scenario B	Scenario C	Jobs in 2025 Share Scenario A	Scenario B	Scenario C	Contribution to total job growth Scenario A	Scenario B	Scenario C
Non-AFS	17,090	0.174	36,835	17,090	32,312	0.250	0.116	*0.219*	0.40	0.00	*0.310*
Farming, own, and wage labor	73,396	0.747	94,593	122,534	100,960	0.642	0.831	*0.685*	0.43	1.00	*0.561*
Food manufacturing	2,237	0.023	4,644	2,237	4,100	0.032	0.015	*0.028*	0.05	0.00	*0.038*
Marketing and transport	4,704	0.048	9,466	4,704	8,403	0.064	0.032	*0.057*	0.10	0.00	*0.075*
Food preparation away from home	846	0.009	1,873	846	1,636	0.013	0.006	*0.011*	0.02	0.00	*0.016*
Total	98,273		147,411	147,411	147,411	1.00	1.00	*1.00*	1.00	1.00	*1.00*

Note: Scenario C italics as "best bet" projection

Under the 'best bet' scenario presented in Table 2.4 the current food regime trajectory, the total number of jobs in agriculture is likely to increase only modestly, while the absolute number of jobs in so called value-add sectors, such as food marketing transport, processing, and food preparation away from home are all likely to more than double in between 2010 and 2025 (Tschirley *et al.* 2015). These jobs will be increasingly urban in nature.

Minde *et al.* (2015) highlight that the transition Tschirley *et al.* refer to is already well under way. Both sets of authors join Kaneene *et al.* (2015) in stressing that more change has already taken place than many realise. As has been pointed out already, these changes are likely to drive major structural changes in the nature of employment opportunities available to youth in the food system. These changes are likely to include shifts in the number of jobs in the sector, the increasingly urban nature of these jobs, the type of jobs available, the level of incomes they derive, and ownership structures to name but a few.

While it may be true that Africa, and particularly South Africa, is undergoing and has undergone (respectively) a major wave of corporatisation and formalisation of the food system, Minde *et al.* (2015) stress that the self-employment still dominates the AFS employment landscape. As shown in Table 2.5, their research suggests that on average self-employment accounts for 78% of all AFS jobs in Malawi, South Africa, Tanzania and Uganda. This has specific implications for youth from poor backgrounds who have neither the formal education, nor the networks to enter into formal sector.

Table 2.5: The importance of self-employment in the agri-food system in Malawi, South Africa, Tanzania & Uganda (Source: Minde *et al.* 2015).

	Self-employed	Wage labor: casual	Wage labor: permanent
Agriculture	32,040,955 (69%)	5,431,739 (12%)	2,304,508 (5%)
Post-farm AFS	4,245,910 (9%)	910,852 (2%)	1,706,296 (4%)
Total AFS labor	36,307,026 (78%)	6,345,502 (14%)	4,013,797 (9%)
Total AFS	46,739,915		

Sources: World Bank (2014a, b), compiled by aggregating data from LSMS tables for the countries involved

While not all who are self-employed are in the informal economy or operating at the micro-enterprise level, it seems probable that the majority of self-employed people in these regions fall into these catagories. In recent years, micro-enterprises and the informal economy have been receiving renewed interest in meeting youth employment challenges (White, 2012). Recognition of the importance of the informal economy, and informality in general, highlights the need to think seriously about employment pathways (and training for the related competencies) for youth into the AFS.

All of the above suggests an unprecedented need to improve and upscale the education and training offerings currently available to youth entering the job market in the formal and the informal sectors of the AFS. It also clearly articulates the need to foster radical forms of social and environmental innovation within these education and training offerings.

2.3.5 CURRENT EDUCATIONAL STRUCTURES LAGGING BEHIND THE TASK AT HAND

A wide range of research and policy documents agree that achieving productive engagement of youth into agri-food systems will require considerable focus and investment into youth awareness, capacity and skills (NPC 2012; NYDA, 2015; White, 2012; Haggblad *et al. 2015;* Minde *et al.* 2015; Tschirley *et al.* 2015). Once again this is particularly true of the South African situation, where the education system is failing the majority of that country's youth (Spaul 2013). The South African public schooling system rated the worst among all middle-income countries globally and performs well below many low-income African countries (Spaul 2013). Currently only 12% of all students entering the schooling system exit with required skills for university admission (fewer still actually enrol for university) and only four in every ten complete matric at all (NYDA 2015; Spaul 2013).

According to the South African National Youth Policy (2015), large numbers of young people exit the education system prematurely and possess no professional or technical skills. This makes them effectively unemployable. The policy document goes on to stress that 'even the minority [of students] who successfully complete post-school education are often not sufficiently prepared for the workplace due to the poor quality of education and training provided' (NYP, 2015, p11).

At a post-school level, agricultural education and training providers across much of the region are battling to keep up with the scale and scope of demand for training in the AFS. Faced with a number of constraints ranging from budget cuts to faculty shortages, many AETs are also battling to stay abreast of the changing nature of the job market their students are ultimately exiting into (Minde *et al.* 2015). In many places, including South Africa, AETs often find themselves diverted from providing specialised AFS skills due to the need to provide extensive remedial support on topics such as basic numeracy and literacy in order to compensate for failing school systems (Minde *et al.* 2015).

Thus, there is a pressing need to think about skills platforms for the AFS which can cater to the majority whom the current South African schooling system fails (NYDA 2015; Tschirley *et al.* 2015).

2.3.6 IMPLICATIONS FOR YOUTH INCLUSION

In summary, it is argued that the demographic shift unfolding across Africa represents a landscape level pressure which will open a window of opportunity for transformation of the food regime. Hence, if a transition towards a more socially just and environmentally sustainable food system is to be realised timeously, youth will need to be inspired, capacitated (with the requisite skills and assets) and supported (with the requisite policy, financing instruments, extension services, etc.) to create a food system radically different in structure and values to any historical precedent and the direction in which current trends are headed. As White has noted:

There are real and important choices to be made, with important consequences for the coming generations. Will young men and women still have the option, and the necessary support, to engage in environmentally sound, small-scale, mixed farming, providing food and other needs for themselves, their own society and others in distant places? Or will they face only the choice to become poorly paid wage workers or contract farmers, in an endless landscape of monocrop food or fuel feedstock plantations, on land which used to belong to their parents, or to move to an uncertain existence in the informal sector of already crowded cities? - (White, 2012, p16)

Failure to resolve these questions is likely to lock the African AFS into a long-term transition process which not only exacerbates the major existing problems within the food system, but contributes to rising social inequality and ecological genocide more broadly across the continent. "Understanding the obstacles to youth job market participation will lead to improved preparation and training necessary to help prevent instability, conflict and violence." (Kabasa *et al.* 2015, p194).

2.4 EXPLORING THE ROLE OF LEARNING INSTITUTIONS IN FOOD SYSTEM TRANSITIONS

The need for an enhanced focus on youth inclusion into thinking around food system transitions has been outlined thus far. In doing so it is suggested that in relation to the food system, existing education systems are failing the current generation of young people. Both of these points highlight the need to think creatively about youth capacity building as a critical strategic

opportunity in achieving a sustainable and just transition in the African and South African context.

The argument then follows that processes and spaces of learning become critically important to achieving a transition within the food system. As Greenberg (2015, p18) notes, 'Agro-ecology and its support systems are knowledge intensive and it will take time to build the requisite skills and knowledge. The point is to start with a very clearly defined and manageable agenda and expand through learning in practice.' The challenges associated with shifting farmers over to knowledge intensive agroecological farming systems has been widely noted (Thrupp 1996; Clement 2006; Horlings & Marsden 2011; Caron *et al.* 2014). Connecting to the networked notions of competence (Carlsson and Stankiewicz 1991) and transformative agency (Moore & Westely 2011) introduced in section 2.1.7, Warner (2007, p144) argues that the 'knowledge-intensive character' of sustainable agriculture 'requires cooperative social relations, although insufficient work has been done on this topic'. This is a theme which is picked up again in section 2.4.7 and Chapter 5.

2.4.1 CONSIDERING THE ROLE AND POSITIONING OF HIGHER EDUCATION

While it is widely acknowledged and understood that a large part of our learning as individuals occurs outside of formalised learning institutions (McGivney 1999, Dabbagh & Kitsantas 2012), formal learning institutions such as schools, technical colleges and universities, also play a powerful and important role in defining culture, capacities and social trajectories. Universities, technical colleges and other agricultural education and training organisations act as potential centres of innovation, often serve as bastions of regime legitimation and can play a powerful strategic role in the political economy of the food system (Kabasha *et al.* 2015, Haggblade *et al*. 2015).

This leads to the suggestion that there is a key question pertaining to learning institutions dealing with food system related education which very few of these organisations seem to be asking or making explicit:

What type of food system transition does the training we provide support, and what will this mean for youth employment in the future?

Once again, Minde *et al.*'s (2015) research into the implications of Africa's changing food system on labour demand and capacity development provides a clear example of an approach which assumes passive responsiveness on the part of AETs. It predicts a specific transition in urban areas towards more processed food eaten away from home. The projected skills requirements for this unfolding corporatisation of the food system are calculated and then matched back to the kinds of training to be delivered.

"Education requirements increase with food system development [development here is seen a shift towards a Western model]. Post-farm segments of the food system, in general, require higher levels of education than farming. Since this part of the food system is growing significantly faster than employment on the farm." (Minde *et al.* 2015, p144).

In summary, according to the authors, skill requirement will change along with food systems transformation in the following ways:

(1) Education requirements increase with food system development.

(2) Post-farm segments of the food system, in general, require higher levels of education than farming. Since this part of the food system is growing significantly faster than employment on the farm (Tschirley *et al*. 2015), educational requirements in the AFS will likely increase gradually over time.

(3) Even in the most advanced, top tier food systems, over 90 percent of all workers require at most a secondary education, and fully 70 percent require at most middle school training. Elsewhere, in middle and bottom tier food systems, primary school leavers and drop-outs account for 85% of the AFS workforce. As a result, teaching of agriculture skills needs to happen at primary and secondary level because most of these school leavers will not be able to continue to tertiary and if they will already have some agricultural skills, they will enable them to be employed more easily.

Given what we know about a) the youth demographic bubble and the likely worsening of what is already a major youth unemployment crisis, and b) historical experience of how corporatisation of the AFS consolidates profit and power while driving down jobs in the sector; there is a need for a high-level of awareness among AET institutions around the type of skills they deliver into the sector.

It seems plausible, that through a focus on delivering highly competent and well-trained employees ideally suited to meeting the staffing requirements of an increasingly corporatised and consolidated AFS, that these AET's will in fact be contributing to a deepening of the youth unemployment crisis in years to come.

This raises the question: To what extent are universities and training centres simply responsive to the needs of the job market and to what extent do they actively focus on building capacity in support of shifting the food system?

This point is well demonstrated in Minde *et al.'s* 2015 paper titled *Challenges for agricultural education and training (AET) institutions in preparing growing student populations for productive careers in the agri-food system.* The article is in many ways a very well thought through account of the status of AFS employment in Africa and the relationship between an unfolding food system transition and the AET landscape.

However, despite suggesting that self-employment constitutes 78% of all AFS jobs, only a single paragraph in their whole assessment makes explicit reference to the need to think about AET responsiveness to the self-employed within the AFS. In contrast, it provides a broad and lengthy set of recommendations for the future AET in Africa. These recommendations seem to support what Holt-Giménez & Shattuck (2011) would classify as an explicitly neo-liberal, 'World Bank' type approach to AET transformation. Examples of this include:

- Framing employment opportunities (and hence training delivery) in relation to private sector skills shortages
- Resolving state budget cuts through increasing private sector funding of training
- Internships & practical learning facilitated through agri-business partnerships and placements

- Undertaking university level agricultural research and development in partnership with Agri-business and other private sector stakeholders

In the context of the urgent need to address joblessness in the present, and given what many interpret to be an inherent inevitability of the directional change within the food system, this approach to capacity development within the food system could be easily be argued as the most pragmatic and realistic given the various limitations. It is clear where the system is heading, what kinds of jobs this kind of food system will require, and therefore what skills AETs need to deliver in order to help young people get jobs.

The fact that the majority of evidence suggests that the overall directional change for the food system identified by Minde *et al.* (2015) is highly unsustainable is not central to the discussion on future training trajectories they present. In so doing, universities, colleges and schools which position themselves primarily as being *responsive* to the labour market become complicit in enabling a transition towards an unsustainable food system.

Even by World Bank's own admission, corporate-led land investments in Africa are not fulfilling their promise of employment creation for local people (White, 2012). According to the authors of a World Bank report, 'In many of the case studies, progress with implementation was well behind schedule. As a result, local people had often suffered asset losses but received few or none of the promised benefits' (Deininger & Byerlee 2011, p33). In addition - and of critical importance to the overall argument which this thesis builds - the authors clearly state that due to the limited availability of non-agricultural employment across much of the world (Africa being no exception), 'potential productivity benefits from large-scale mechanised farming are likely to be outweighed by undesirable social and equity effects.' (Deininger & Byerlee 2011, p36). The South African National Development plan mirrors this sentiment, stating that if the expansion of agricultural production 'takes place within the current structure of farming by merely expanding large-scale commercial farming. The potential to create additional jobs is limited.' (NPC 2012, p225)

The intention in critiquing a market-led approach to AET innovation is not to paint the private sector and globalised agribusiness as an absolute evil, but rather to surface an implicit paradigm of capacity building and research which caters to a comparatively privileged minority sector in the ASF sector at the expense of a much larger and comparatively under-privileged majority.

An alternative approach would be to reverse the question and to ask first what a transition towards a more sustainable food system would look like, then unpack the types of roles that would need to be fulfilled in order to bring this into existence, and then finally to focus on developing training outcomes which deliver these skills into the market. Kabasa *et al. s*upport this stance to some extent. They argue that the public health implications of changing food systems tend to become visible far later than than supply side pressures such as shortages in urban wholesale markets and dissatisfied agribusiness employers (Kabasha *et al.* 2015*).

They argue that early and strategic action around the training needs of a "new generation of food system professionals…offer additional tools for influencing nutritional and public health outcomes" (Kabasha *et al.* 2015, p191)

Thus, if AETs are seen as both centres of innovation for public good and as centres of learning, there is a clear need for AETs to be pursuing processes of innovation towards not simply supporting the job market, but strategically defining the direction of the market more broadly through the types of skills they release into the economy.

This then becomes quite a clear line of argument for developing capacity for youth centred, labour intensive, agroecological forms of agriculture capable of intensifying production sustainability and without the need for consolidation, as well as focusing on building the requisite skills beyond the farm gate that support a dietary transition which is both in line with societal wellbeing (health and equality) and the safe ecological operating limits of the agricultural landscapes which support them.

This is clearly not simply a question of changes to agricultural capacity building in isolation, but rather a call for a holistic approach through which African AET's can drive increases in the employment intensity of the food system through the creation of green economy jobs across multiple strategic nodes.

2.4.2 CONSIDERING LEVELS OF INTERVENTION

In South Africa, only one in ten youth leaving school qualify for university admission, fewer still are able to afford access and fewer again successfully complete the university qualifications once admitted (Spaul 2013). In 2002, 4% of black youth between the age of 18-29 were enrolled in tertiary education institutions. Eleven years later, by 2013, this had risen just 0.3% to 4.3%. Black youth, fared slightly better than coloured youth in this regard of whom only 3.1% were enrolled in tertiary education in 2013. These figures which stand in stark contrast to the Asian and white populations for whom the corresponding figures in 2013 sat at 9.2% and 18.7% respectively (NYDA 2015).

Thus it seems fair to say that the direct needs of at least 90% of South Africa's most vulnerable, employment-aged youth are not reflected in training offerings provided by traditional universities. Similarly, it can be argued that while traditional universities have a critical role to play in the transformation of the food system, they do not reflect the skills required for an employment intensive, micro-enterprise driven economy in which many jobs exist in the informal sector (see section 2.4.4).

It has been also argued that although education requirements increase as food systems develop, over 90% of workers currently employed in the South African agri-food system had at most the equivalent to a final high-school leavers certificate (Tschirley *et al.* 2015; Kabasha *et al.* 2015). Therefore, a range of actors have argued for the need to focus on training innovation for youth who have either failed to complete high-school, or have completed high school do not qualify for university admission (White, 2012; Spaul 2013; NPC 2012, 2014;, NYDA 2015; Tschirley *et al.* 2015; Kabasha *et al.* 2015) as well as on-the-job learning (NYDA 2015). The 2002 reforms to the AET system in South Africa were a step in this direction.

2.4.3 CONSIDERING GEOGRAPHIES OF CAPACITY BUILDING IN LIGHT OF 3 INTERCONNECTED TRANSITIONS - YOUTH, URBANISATION AND FOOD

The sustainability battle is increasingly taking place not in the city but upon the 'city to be', where the urban and rural become blurred categories. Such contexts can be defined as the peri-urban interface, where cities' appropriation and transformation of nature's nutrient cycle manifests most intensely (Allen 2014).

Rapid and often informal/unplanned urbanisation are transforming rural land and agrarian landscapes (Swilling 2011). This has resulted in a significant increase in the area of mixed urban and rural land uses around major cities (McGregor & Simon 2012). This urban demographic transition in Africa is changing a number important dynamics within the food system. These include:

1. Changes to where the bulk (volume and value) of food is consumed

2. Changes to where youth increasingly desire to live and work

3. Changes to where nutrient waste streams from the food system concentrate

4. Changes to the political economy of the food system and the way in which food security policy is formulated (away from supporting poor through supporting agriculture towards supporting poor through ensuring availability of food at cheapest possible price).

As urbanisation triggers changes in the physical configuration of the food system (Battersby 2013; Petersen *et al.* 2017), it also changes the employment opportunities within it (Tsierley *et al.* 2016). McGregor & Simon (2012), for example provide evidence from parts of Africa where changing population distribution is triggering increasing food agri-food system opportunities in peri-urban areas.

Yet despite this shift, none of the key South African policy documents linking youth to agricultural employment (reviewed below in section 2.5) make specific reference to the urban and peri-urban food system. This omission is concerning when one considers that 80% of South Africa's young population will live in urban areas by 2050 (DCGTA 2016).

However, in spite of the urban transition, a huge need remains for expanding support to rural youth. While jobs in the urban food economy are on the rise, the rural poor remain comparatively underserviced with respect to education and employment opportunities relative to their urban counterparts (Bakewell & Jónsson 2011). Urban youth, tend to have better access to a wider variety of higher quality schooling and post-school learning opportunities (HSRC 2005). Therefore, while there is a growing need to consider food system training for youth in urban areas, driving innovation and improvement of training for rural youth should remain a priority.

According to Greenberg developing a network of increasingly decentralised agroecology training centers can 'go a long way to support socially and ecologically sustainable production' (2015, p18).

2.4.4 LINKING INFORMALITY AND LEARNING

If we accept that an undisclosed but overwhelming majority of livelihoods within the food system are in the informal sector (spanning production, distribution, processing and retail), then training innovation should support this. If training paradigms were to embrace this dual economy, how would learning need to be positioned in order to help youth to thrive in the informal economy? And, more specifically, can this be done in ways that catalyse larger systemic transitions toward a just and sustainable food system?

Comparatively little is written on learning for sustainability in the informal economy. However, in 2002 the ILO did attempt to provide some review of learning in the informal economy more broadly.

Unsurprisingly, the ILO noted that 'The development of relevant skills and knowledge is a major instrument for improved productivity, better working conditions, and the promotion of decent work in the informal economy. New skills and knowledge can open doors to more economically and socially rewarding jobs' (Liimatainen 2002, p4). Liimatainen identifies the need to consider alternative training methodologies, because the majority of people who work in the informal economy tend to have very limited access to formal education and often lack basic numeracy skills. Places like the Barefoot College in India, that have circumvented traditional numeracy and literacy barriers to provide relatively technical training to illiterate adults, offer an example of these types of training innovations (Krishna 2017; Szekely & Mason 2018). King and Abuodha (1995) also noted that in the Kenyan informal economy, education levels (both formal and informal) were on the rise. They cited weakening employment prospects in the formal sector as the driver behind this.

Building on this, Singh (2000) notes that informal and non-formal (institutional but un-accredited) training seems best positioned to respond to the needs of the informal economy. Formal training was seen as prohibitively expensive, too generalist and overly theoretical. Basically, 'formal training is not responsive enough to the market demand outside the modern formal sector' (Liimatainen 2002, p9). This finding is congruent with the conclusions of the research presented in Chapter 4. In contrast to the ILO's work which tends to emphasise trade-related upskilling it is worth noting that informal traders organisations see the problem quite differently. Organisations such as StreetNet and WIEGO emphasise the need for expanding capacities related to disruption of hegemony and the fortification of the solidarity economy (Núñez Soto 2011).

From an agricultural perspective the role of well functioning extension services in facilitating learning in the small-scale farming sector (which is predominantly informal) is covered in more detail in section 2.5.4.

2.4.5 IMPLICATIONS FOR LEARNING INSTITUTIONS IN SOUTH AFRICA

Achieving a transition towards a vibrant and equitable agricultural system based on the principles of accumulation from below and underpinned by ecologically sustainable production is a knowledge intensive undertaking. However, when it comes to the food system, existing formal education systems are failing the current generation of young people. Current formal

tertiary education systems cater to 10% of the youth at best, and often the training these institutions deliver caters exclusively towards employment in the corporate food regime. This perpetuates the corporate food regimes. Even within this normative framing the quality of training youth receive in many formal institutions poorly equips them for work in the existing food regime. This also begs the question, what happens to the other 90% who don't receive a formal qualification?

A large training gap exists for those who did not complete high-school or did complete high school but do not qualify for (or cannot afford) tertiary training.

Formal and non-formal training have traditionally focused on skills for the formal economy. This has left a huge institutional blind spot with regards to skills in the informal food economy – despite the fact that it supports millions of South Africans. The informal economy is a big employer, but it is also arguably one of the biggest and most effective training providers of marginalized youth in South and Southern Africa. Despite its contribution, the substantial on-the-job and community based mentorship that the informal economy delivers remains largely unrecognized.

Achieving a transition within the food system will require equipping today's youth with a set of radically different skills and competencies required to drive this transition. It will require many formal training institutions to acknowledge the ways in which they currently reinforce the technological lock-in to unsustainable trajectories through the kinds of training they provide.

This suggests that changing the way youth engage in the future of the food system requires something akin to a competency revolution which rests on a blended strategy. Blended in its coverage of informal and formal food economies and the diverse learning providers that underpin these; Blended in the geographic focus; And increasingly blended along the value chain.

It will also require an increasing blend of skills – balancing between skills needed to practically work and earn in the present system, while also increasing youth's ability to challenge power and action transformative visions.

2.5 OVERVIEW OF THE NATIONAL POLICY LANDSCAPE IN SOUTH AFRICA

The following section provides a scan of the national policy space as it relates to youth, skills and change within the food system. Three policy documents were selected to provide a policy reference point for the wider research proposal. The three documents selected were the National Development Plan of 2012 (NPC 2012), the National Youth Policy of 2015 (NYDA 2015) and the National Extension & Advisory Services Policy (DAFF 2014) that was approved by Cabinet in 2016 and is currently being gazetted.

2.5.1 *A NOTE ON THE SOUTH AFRICAN FOOD AND AGRICULTURAL POLICY LANDSCAPE*

Food policy globally has been characterized as a 'wicked' problem (Candel & Pereira 2017).

In describing wicked problems in the South African food system, Hamman *et al.* (2011) use Lazaru's definition, citing a 'wicked problem', to be one that 'defies resolution because of the enormous interdependencies, uncertainties, circularities, and conflicting stakeholders implicated by any effort to develop a solution' (Lazarus, 2008:1160 in Hamman *et al.* 2011). A key characteristic underscoring the complexity of the South African food system is that 'different stakeholders contest the causes and effects of the South African food system on many levels' (Pereira & Drimie 2016, p4). The fact that both the causes and solutions to youth and food system failure are deeply contested contributes to the 'wicked' nature of the problem. This is exacerbated by the unusually broad range of formal and informal food governance arrangements which public decision makers need to navigate (Candel & Pereira 2017), as well as high levels of uncertainty resulting from the myriad of interdependent, non-linear feedback loops in the food system (Pereira & Drimie 2016).

In the face of this complexity, various agricultural policy documents have emerged in South Africa since 1994. These tended to have had three focus areas in common: (1) improving the competitiveness of commercial agriculture in a free market dispensation, (2) improving participation by disadvantaged communities, and (3) protecting the natural resource base. However, the food policy connecting agricultural policy to the ways in which food is accessed, consumed and integrated in a broader food system has been far less clear (Drimie 2016).

The NDP is the key guiding document that integrates food and agricultural policy into a broader medium-term strategy document for South Africa and is now enjoying a resurgence as the major policy frame for the country post-Zuma (Drimie 2016). Additional policy documents include the New Growth Plan (NGP), The Roadmap for Nutrition in South Africa 2013–2017 (DOH 2013), the Integrated Growth and Development Policy for Agriculture, Forestry and Fisheries (IGDP) (DAFF 2012); and the Agricultural Policy Action Plan (APAP) (DAFF 2013).

Both the NDP and NGP are supported by the first cycle of the Medium Term Strategic Framework (Drimie 2016).

While all of these documents target aspects of the food system and, at times, may seek to drive integration across departments, the overarching policy landscape remains acutely incoherent (Drimie 2016). This 'profound lack of coherence', has 'important implications for a food system that is faltering in many respects' (Drimie 2016, p1).

In their evaluation of why this incoherence persists in spite of efforts to operationalize more holistic food system governance arrangements in South Africa, Termeer *et al.* (2018) make the following conclusion: 'Tensions between the ambitious objectives of the arrangements and the institutional constraints of implementing them can persist because of inadequate resources to facilitate transformative change' (Termeer *et al.* 2018, p85). Implementation and coordination mechanisms appear to be either vague in detail, or simply missing from policy formulation altogether. This is, in turn, undermined by a lack of monitoring and evaluation mechanisms (Drimie 2016).

In the context of this study a few further points are worth noting.

The first is that all of the aforementioned policy documents direct considerable attention to the role of the agricultural sector as an engine for job creation. However, the strategies for pursuing job creation display fundamental contradictions. These contradictions exist between policy documents and between policy and the political rhetoric of different departments.

Contradictions between the liberalization of the agricultural sector and policies in support of land reform and restitution are exemplary of this. The political imperative for redress in the transition to democracy pitched existing jobs within white own commercial agricultural enterprises against notions of social justice and the prospect of jobs on black farms in the future. Trade liberalization policies of the 1990's further deepened the policy contradictions (Greenberg 2013). At just the time that land reform and rural development policies were attempting to usher in a new class of small and medium sized black farmers, the Marketing of Agricultural Products Act (Act 47 of 1996) and the 2001 Strategic Plan for Agriculture were opening the country up to increasing international competition from extremely large argo-industrial companies (Battersby, Marshak & Mngqibisa 2017). As Greenberg explains, 'The ANC in government supported the continuation of the commercial agricultural restructuring process without consideration for the impact on the creation of a black farming class, whether large-scale commercial or small-scale.' (Greenberg 2013, p15). The result is that 'small-scale farmers and food processors are adversely incorporated into the system, which reproduces the unequal power relations at the heart of the current agro-food system.' (Greenberg 2015, p19).

Contradictions such as these are structural, and represent unresolved ideological divergences. In this case, one ideology that favors the continued promotion of medium to large-scale farming based on commodity driven profit maximization. And, another, that problematizes the liberalization and corporatization of the food system, favoring a pro-poor approach based on the promotion of small-scale family farming.

According to Greenberg, the South African government 'is held back by the idea that large-scale commercial agriculture is the only way of ensuring food security in South Africa, reinforced by the constant advice of experts with a material stake in the continuation of large-scale commercial agriculture. There is an embrace of the modernisation paradigm with the implicit acceptance that peasant or small-scale agriculture is obsolete.' (Greenberg 2013, p23)

Drimie (2016) and Haysom (2015) draw attention to two further points, which have direct implications to the youth and employment focus of this thesis.

Firstly, all food and agricultural policy in South African exhibits a rural bias. These authors raise concern that given that more than 60% of the South African population is urban, that the rural focus in policy obstructs change in urban areas.

Secondly, the informal sector plays a central role in how food is produced, processed and accessed. Yet despite this, the informal sector is neglected and often criminalized by the current policy regime (as discussed in section 2.2.5).

2.5.2 NATIONAL DEVELOPMENT PLAN:

The National Development Plan (NDP), undertaken by the National Planning Commission (NPC) and released in 2012, aims to serve as an overarching strategic plan for South Africa, uniting all sectors of economy and society around a common programme for eliminating poverty and reducing inequality by 2030 (NPC 2012).

 In reference to youth, the NDP states that 'Having a relatively young population can be advantageous, provided the majority of working-age individuals are gainfully employed. The challenge is to convert this into a demographic dividend. This will only be possible if the number of working-age individuals can be employed in productive activities' (2012, p98).

The NDP places agriculture at the centre of its strategy for rural development. It estimates that one million direct and indirect jobs could be created in agriculture over the 15 year period between 2015 and 2030. These would span the formal and informal sectors. Of these, the NDP sees the highest potential for job creation in small-scale farmers with 0.5-5ha of land, and irrigated labour intensive commercial (smallholders) as reflected in the Table 3 below.

Table 2.5: The employment creation potential of South Africa agriculture (Source: NPC 2012)

FIG 6.1 **THE EMPLOYMENT CREATION POTENTIAL OF SOUTH AFRICAN AGRICULTURE**

Target group	Primary jobs created	Secondary jobs created	Assumption
Subsistence farmers with <0.5 hectares	83 000	41 500	The livelihoods of one in 10 of the farmers in this category are improved.
Small-scale farmers with between 0.5 and 5 hectares of land	165 000	82 500	The livelihoods of half the farmers in this category are improved.
Small-scale farmers with >5 hectares of land	75 000	37 500	These farmers employ themselves and two others.
Better use of redistributed land	70 000	35 000	Redistribution beneficiaries employ themselves and two others; one in 10 restitution beneficiaries become self-sufficient.
Labour-intensive winners	200 000	100 000	Critically, this requires investment in irrigation, support to smallholder farmers and their ability to grow their businesses.
Labour-extensive field crops	10 000	5 000	This reflects a "high road" or optimistic scenario and assumes that the current decline in employment in commercial farming is halted.
Labour-extensive livestock	40 000	25 000	This reflects a "high road" or optimistic scenario and assumes that the current decline in employment in commercial farming is halted.
Total	**643 000**	**326 500**	969 500

Note: The employment multiplier between agriculture and its upstream and downstream industries has been taken at a conservative estimate of 0.5 for small-scale farmers.

In pursuing this, the NDP, in conjunction with the Bureau for Agricultural Policy, identifies a number of sectors with high growth and employment potential outlined in Figure 2.8 below.
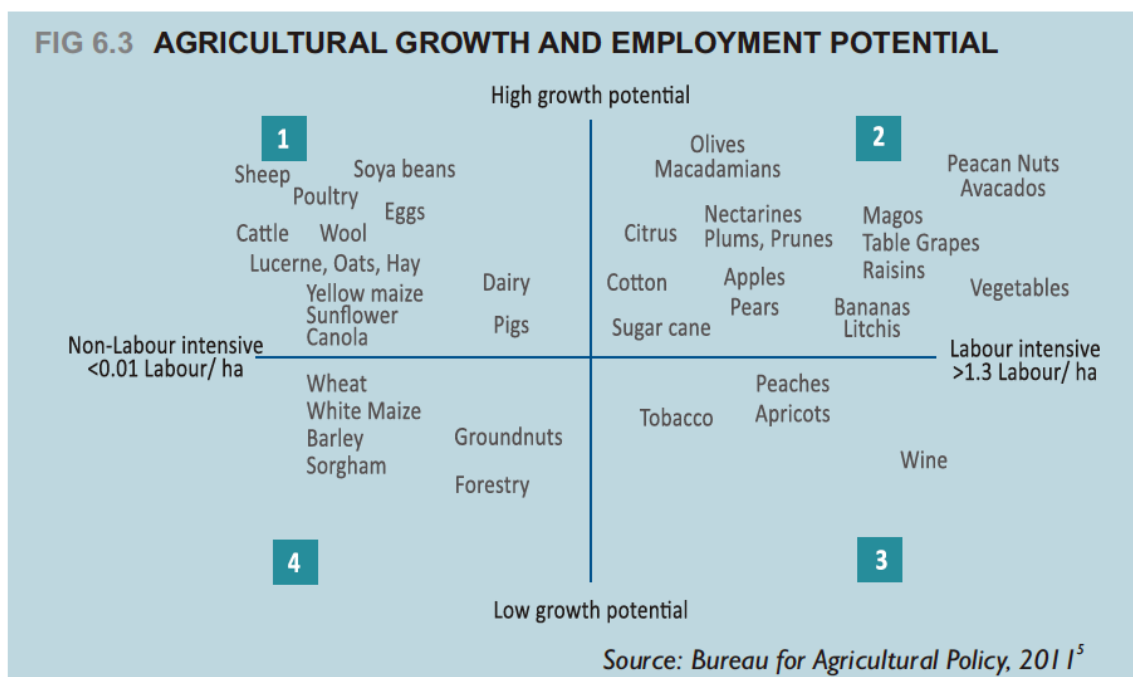
Figure 2.8. (Source: Bureau for Agricultural Policy 2011 in NPC 2012).

However the NDP stresses that 'creating jobs in agriculture will not be easy. It will require credible programmes, sound implementation, significant resources and stronger institutions' – many of which are lacking at present (NDP 2012, p219) . The authors of the NDP go on to argue that in spite of the range of existing challenges in the sector, including those around failing land reform and extension services:

 '*with the right approach it is possible to reverse the decline in the agriculture sector, promote food production and raise rural income and employment. White commercial farmers, agribusinesses and organised agricultural industry bodies can help bring these objectives to fruition. A significant effort and resurgence in agricultural training is required.' (NDP 2012, p220)*

However, while the plan's authors recognise the role of the existing commercial sector in creating these jobs, it argues that "if the expansion of agricultural production envisaged in this plan takes place **within the current structure of farming by merely expanding large-scale commercial farming**, the potential to create additional jobs is limited." (NDP 2012, p225 – own emphasis).

This emphasis on breaking out of the existing structure of large-scale commercial farming, as well as focusing effort into training innovation speaks directly to the focus of work already underway within the niche environment that is the focus of Chapters 4 and 5.

Interestingly in the NDP's categorisation, 'subsistence' is set at producers farming on less than 0.5 hectare, whereas experiments with in urban and peri-urban context suggest that with the right support and linkages to niche markets, livelihoods equivalent or above basic minimum wage can be created on less than 0.2 of a hectare (Melville & Chittenden 2017).

This raises the question: Has the NDP missed a critical opportunity for agricultural job creation by framing agricultural jobs solely as a rural issue, and in doing so underestimated the employment potential of the sector? Secondly, has the potential of urban and peri-urban land been neglected in terms of its ability to contribute to viable land based job creation?

At a local municipality level this rural policy bias may be changing in some urban areas. The City of Cape Town, for example, was the first South African city to endorse an Urban Agriculture Policy in 2007 (Kanosvamhira 2018). While it has been noted that urban food policy should not become disproportionately focussed on production (Haysom & Battersby 2016), Battersby *et al.* (2014) do recognise the contribution it has to make to urban food security and cite the Western Cape provincial department of agriculture as an important actor in Cape Town's urban agricultural landscape. Despite potential attitude shifts at a local government level, the absence of these questions from national and regional policy persists.

This in turn raises policy questions about the knock-on effects of this potential oversight in terms of neglect to high potential urban and peri-urban sectors which hold the potential to address land reform and livelihoods without the need for large tracts of land. Linking this to questions of youth employment may imply a land reform policy shift away from focus on total land area, in favour of a focus on livelihood and lifestyle potential of land transferred through land reform processes. As youth tend to be drawn toward urban areas (Dudwick *et al.I* 2011*;* Stockdale & Catney 2014), it also raises questions about the preferences among youth for agricultural land in urban and peri-urban areas. Should a youth-centric land reform policy favour land closer to urban centres?

In relation to youth skills and incorporation into the agricultural sector, the NDP also makes the following proposals for youth more broadly:

- Strengthen youth service programmes and introduce new community-based programmes to offer young people life-skills training, entrepreneurship training and opportunities to participate in community development programmes.
- Strengthen and expand the number of Further Education & Training (FET) colleges to increase the participation ratio to 25%, increase the graduation rate of FET colleges to 75%, provide full funding assistance to students from poor families and develop community safety centres to prevent crime.
- Create a tax incentive for employers to reduce the initial cost of hiring young labour-market entrants, provide a subsidy to the placement sector to identify, prepare and place matric **graduates into work;**

These recommendations were picked up on in the 2015 National Youth Policy.

2.5.3 NATIONAL YOUTH POLICY

The National Youth Policy (NYP) describes itself as 'A youth-specific policy that focuses on increasing the employment chances for young[2] people' (NYDA 2015, p3). The policy holds youth employment as its core focus.

Similarly to the NDP it states that 'Young people are a major human resource for development [whose] imagination, ideals, energy and vision are essential for the continuous development of society.' (NYDA 2015, p2). The policy's authors repeatedly stress that South Africa 'still has an unacceptably high number of young people who are not in education, employment or training'.

The NYP highlights the urgent need to 'prevent the profound personal and social effects of unemployment.' Building on this, the policy makes clear reference to private sector and the economic rationale behind youth inclusion. It also highlights the need to take 'new approaches' toward the development of 'active citizens' who are 'economically included'. In the words of the document:

'South Africa has the potential and capacity to eliminate poverty and reduce inequality over the next two decades. This requires a new approach – one that moves away from passive citizenry towards a socially and economically included society in which people are active champions of their own development, supported by an effective government.'

The policy goes on to contextualise the need to focus on youth inclusion in light of both national and international trends in youth unemployment. In the opinion of the NYP, the leading contributing causes behind employment crisis in South Africa are as follows:

1. **A weak human development pipeline**: This includes poor educational throughput between successive levels of schooling and poor quality of education within existing institutions.

2. **Low skills and lack of work experience for those currently outside of the formal education system:** This includes large numbers of young people exited the education system prematurely and possess no professional or technical skills,making them effectively unemployable.

3. **Inadequate legislative frameworks around youth work**

4. **Poor health, high HIV and AIDS prevalence, and high rates of violence and substance abuse**

A relatively wide range of interventions are proposed. A number of these relate specifically to the focus of this research because they can be interpreted as a implicit call for a youth centric transform the food system transformation. These include reference to the need to address economic inequality through radical forms of economic transformation and land-reform. Linking to this, specific reference is made to the agricultural sector as a driver of employment and green economy as a growth sector ideally suited to a youthful population. In order to achieve this, the expanding the role which civil society organisations play as a network facilitators and connectors of youth is noted. So too is the fact that most of this the need for improved access to quality education, opportunities for workplace experience and the need for 'second-chance' opportunities for uneducated youth.

2.5.4 NATIONAL EXTENSION & ADVISORY SERVICES POLICY

Through the types of skills and information they do (and do not) provide, agricultural extension and support workers plays a critical role in defining the types of agrarian systems that succeed and those that fail. Looking back on national extension policies over the past 50-100 years helps explain the dual agricultural system in South Africa today.

In 1972 Lipton noted that, 'while 90,000 rich, educated white farmers have 3,000 extension officers, 600,000 black farmers have less than 1,000 extension officers'. Lipton goes on to describe black extension officers as 'hopelessly overstretched men' with impossibly small budgets (Lipton 1972 p258).

This represents a historic ratio of one extension worker to every 30 white farmers, and a ratio of one to 600 for black farmers.

When considered in conjunction with the enormous injections of easy credit, marketing facilities, and guaranteed prices and other forms of direct and indirect subsidization which white commercially orientated farmers received for decades, the wealth and technical sophistication of the sector today relative to historically neglected black farmers should not come as a surprise (Williams *et al.* 2008).

Fast forward to post-apartheid South Africa, and the matters seem to have worsened. Hall and Aliber estimate that at a national level the average ratio of extension workers to farmers (of all races) now sits at around 1 to 878 (Aliber and Hall 2012b). By DAFF's own admission, 'in its current form extension and advisory services indirectly limit rather than facilitate the implementation of agricultural development' (DAFF 2014 p5). This acknowledgement led to the initiation of the Extension Recovery Programme in 2008, and subsequently the new policy on Agricultural Extension and Advisory in 2018.

These efforts to revive the extension services align with the NDP, which identifies agriculture as as a potentially significant driver of job creation in South Africa. Like the National Planning Commission, DAFF highlights the particular need for innovation and systemic transformation in order to unlock the unrealised potential of the smallholder farming sector.

According to the policy (currently being gazettled), "Agriculture, forestry and fisheries have been identified among the sectors with the highest potential to make an immediate and sustainable contribution towards job creation in rural areas"

DAFF highlights the fact that efficient and effective extension and advisory services can broker and facilitate information sharing and skills development in support of agriculture, especially for smallholder entrepreneurs. However, DAFF acknowledges that "In its current form, public extension service cannot facilitate the accelerated capacity development of a range of producers that is desired to address, challenges of rural and economic growth, food insecurity, inequality and unemployment."

In response, the policy calls for 'an urgent need for targeted and visionary reform of extension and advisory services as an effort to ensure their effectiveness and relevance to the country's agriculture'.

Towards this end, and of specific reference to this research and the niche case study it puts forward, the policy outlines among others, the follow list of actions:

1. The need to acknowledge the dualistic nature of South Africa's agricultural sector, while at the same time fostering collaboration and unity in the sector - in particular between the existing white commercial farming fraternity and the emerging commercially orientated, black, smallholder sector.

2. Participatory, shared research and learning: The need to reconfigure the relational dynamics between smallholder farmer, extension services and agricultural researchers. In effect shifting the agricultural research landscape towards an increasingly transdiciplinary approach which involves farmers as increasingly active participants in state funded agricultural research processes. To quote directly:

   "Ensuring efficient flow of technological innovations between the researchers, extension and producers can only be achieved through the development of an efficient researcher, extension and producer agent linkages…In essence researcher-extension-producer interactions constitute triangular relationships, where information and innovation flows both ways. Extension practitioners and researchers in particular need to continuously recognize and take into account indigenous knowledge systems."

3. The need for innovative and climate resilient production practises to respond to rising food prices, food and nutritional security, poverty alleviation, diversifying market demands, export opportunities and environmental concerns

4. The need to overcome the lack of 'holistic' thinking and develop a 'systemic', 'value chain' understanding among agricultural support workers to the challenges faced by emerging small holder farmers. Towards this, DAFF highlights the need to 'review education and training curriculum for extension practitioner.' In order to meet the need for a 'multidisciplinary approach to training that capacitates current and future extension practitioners and advisors with the relevant and diverse knowledge and tools without compromising the quality and depth of subject-specific'

5. Establish local district extension forums to bring together diverse groups of relevant stakeholders in the design and coordination, accessing and support of high quality, geographically relevant farmer support.

What is important about these forums is that they are meant to actively engage farmers and respond to needs, offering a pluralist model (multiple streams and options of advice and support) from across sectors. The policy implies that these become networked spaces of learning the recognizes the value of traditional farmer knowledge. This shift in policy opens a fresh opportunity include youth into these localized groupings and better align extension support with the needs of young aspirant farmers of all scales.

2.5.5 SUMMARY OF POLICY SCAN

In summary, there is a clear overarching acknowledgement at a national level for the need to find new solutions to the challenge of youth unemployment and its relationship to the agri-food system. In spite of contradictions and tension within the policy space around the scales and modes of production that will underpin the South African food system, all three policy

documents see clear opportunity for increasing youth participation in the food system in ways which not only increase the employment intensity of the sector, but also contribute more broadly to social and environmental justice. Furthermore, all three are similarly united in the assertion that achieving this will not be possible under the current structure of the food system. Put simply, systemic change is required.

In achieving this change, systemic intervention through education and capacity building is a key guiding recommendation across all three documents. However, in spite of this focus on education and youth all three documents lack any form empirical data regarding youth's receptivity towards being engaged as active citizens in the transformation of the food system. Both the NDP and Extension Policy seem to have emerged independently of rigorous engagement with the very constituency on which the future success of agricultural policy rests – South Africa's youth.

Thus, while this research did not set out with the specific intention to speak to policy, it does support at least two of the overarching policy intentions laid out by these documents – the desire to stimulate new livelihoods for youth in the food system and the focus on education as a key driver in achieving this.

In addition to this, the research also seeks to shed more light on the emerging niche spaces at the fringes of the food system. Light which may, in time, contribute to the formulation of clearer policy visions the food system in future.

2.6 IMPLICATIONS OF CONCEPTUAL FRAMING.

The literature presented in Chapter 2 paints a sombre picture of youth and a region being pushed further into an unemployment crisis by a transition to a corporatized food regime. It also suggests that shifting to a more sustainable trajectory is a knowledge intensive undertaking, which is hamstrung by economic power imbalances, discordant food policy and a failing education system.

In considering this corporatized food regime and the alternatives to it, food system niches remain side-line endeavours, bumping along in relative obscurity in parallel to the much larger corporatised food regime. The total value of organic agricultural output in South Africa, for example, was last estimated at R477 million in 2008 (INR 2008). This is less than 1% of the total output of R68,000 million for the agricultural sector that year (DAFF 2009). In the context of radical inequality, the failure to mainstream side-line sustainability niches is not simply a wasted opportunity. In its worst form, the pursuit of this kind of isolated innovation that splinters off from prevailing social concerns risks worsening existing class divides (Ramos-Mejía *et al.* 2018).

Smith and Raven's framing of empowerment highlighted the need to pay attention to the political elements involved in niche construction. This implies that in order to supersede the corporate food regime, niches need to 'stretch and transform' their selection environments as was discussed in section 2.1.5. To do this '*niche actors need to link to wider processes of social*

change', recognising that 'narratives are key political devices' through which niches achieve change (Smith and Raven 2011, p1032).

There has been some resonance in connecting the more recent framings of organic and agroecological farming to broader traditional farming practices in South Africa. However, in a country in which access to healthy food means simply having enough food to eat on a daily basis, the relevance of how food is grown remains a question from a distant universe. The resounding issues emanating from the national policy arena reflected in the NDP and NYP relate to jobs, growth and economic transformation.

Seen from a strategic niche management perspective, there appears to be a need for food system advocates to reframe and realign niche narratives with the broader 'windows of opportunity' in the prevailing socio-political landscape. Crafting a convincing narrative will require plausible evidence of an alternative that presents viable solutions to heavy hitting political issues around land reform, youth unemployment and structural economic inequalities. Important issues that persist more than 20 years after South Africa's transition to democracy. While efforts toward emerging (black) farmer inclusion and development within the niche clearly indicates an intention, the focus of global research that has been done into organics to date, particularly in relation to organics, has centered around issues of ecological sustainability and consumer health (see for example Bengtsson et al. 2005, Smith-Spangler et al 2012, Tuck et al 2014).

This is a problem because niche success ultimately rests upon broader circles of more powerful actors becoming involved in ways that mobilise widespread social legitimacy (Smith *et al.* 2010*)*. ''Stretch-and-transform niches' [need to] create capabilities and attract resources that empower participation in political debates over the future shape of institutions and regime selection pressures.' (Smith & Raven 2011, p1031). Therefore, when considering long-term transitions in the food system there is a need to ask:

Can a rallying call be built up around niche food systems that present a compelling and inclusive vision that aligns with the issues identified in key policy documents such as the NDP and NYP? And, more specifically, given the youth crisis facing South and Southern Africa, can the political narratives around the niche be aligned with the concerns of youth themselves, as well as the concerns that those in power have about marginalised youth?

2.7 WHAT COMES NEXT

Chapter 3, which follows, works to begin laying this connective foundation between the existing niche and a broader political narrative. It does this by engaging with youth about their attitudes towards in work in the food system. In the context of the MLP, Chapter 3 assumes that youth will act as a landscape level pressure on the food regime but considers the challenge from a Strategic Niche Management (SNM) perspective. In doing so it probes youth attitudes in search of insights into the kinds of windows of opportunity this landscape level shift may open up for food system niches. It asks whether the future of the food system is even an issue that's relevant to youth as they enter their working lives? And, if so, what do the values that youth ascribe to the food system communicate to those working at a niche level about the kind of agenda they should be working on?

Building on the findings from Chapters 3, 4 and 5 shift the attention of this thesis shifts to questions of competency identification and learning at a niche level. Acknowledging that niche learning and innovation play a key role in developing niche agency within the MLP and SET frameworks, Chapter 4 provides grounded insights into informal learning and innovation networks in the food system. Following this, Chapter 5 evaluates tangible methodological tools to enable youth to navigate and leverage these networks.

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3. WE'RE READY, THE SYSTEM'S NOT – YOUTH PERSPECTIVES ON AGRICULTURAL CAREERS IN SOUTH AFRICA

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ABSTRACT

In light of rising levels of youth unemployment in South Africa, now at 50%, research was undertaken to better understand the paradox of young people turning away from agricultural employment in spite of such high levels of unemployment in the country. The research brings to light new evidence of youth perspectives on contemporary attitudes, experiences and expectations of work in the agricultural sector in South Africa.

The research took a narrative based approach using SenseMaker as a tool for blended qualitative and quantitative data collection. A sample of 573 youth narratives were drawn from across three sites in the KwaZulu-Natal, Limpopo and Western Cape provinces of South Africa.

Findings show that attitudes towards careers in agriculture vary greatly. While a set of negative perceptions emerged from the narratives as anticipated, approximately one third of the respondents expressed a clear interest in and passion for agriculture. This interest persisted in spite of a range of pervasive social norms and stigmas. However, these positive aspirations tended to be at odds with the kinds of jobs created by an increasingly corporatized food regime.

The research addresses two key policy documents: The National Development Plan and the National Youth Policy, contributing toward the growing body of literature seeking to understand how agricultural policy based on principles of 'accumulation from below' may be formulated. It also provides an empirical evidence base for activists, educators and policy-makers interested in the role of the agricultural sector in addressing youth unemployment in South Africa and elsewhere in Africa.

"For narratives to flourish, there must be communities to hear… for communities to hear there must be narratives which weave together their history, their identity, their politics"

Plummer 1995, p87

3.1. INTRODUCTION

Persistent unemployment has become synonymous with the youth experience across South Africa. Sixty two percent of South African youth (people aged 15-35 years) are unemployed (ILO 2017) and of these 60% have never been employed (Spaul 2013). When the ranks of youth faced with persistent under-employment and those employed at below what is considered to be a living wage, are added to this, a clear youth employment crisis emerges.

As a primary source of formal and informal livelihoods in South Africa, the food system has been highlighted as a central pillar in the national strategy to address unemployment (NPC 2012). This paper speaks to this national policy discourse. In particular, the South African National Development Plan (NDP), that highlights the opportunity for the creation of an additional one million jobs in the agricultural sector, and the National Youth Policy (NYP), which calls for a focused approach towards addressing the current youth skills crisis through legislative frameworks around youth (NPC 2012, NYDA 2015).

3.1.1 CONSIDERING THE NEED FOR A TRANSITION IN THE FOOD SYSTEM

The NDP clearly states that the targets for agricultural job creation will not be met if future expansion of agricultural production 'takes place within the current [agricultural] structure by merely expanding large-scale commercial farming' (NPC 2012, p225). The NDP thus acknowledges the widely held view (Folke *et al. 2002*; Nellermann *et. al.* 2009; Holt-Gimenez & Patel 2009; Alkon & Agyeman 2011; Aliber & Hall 2012; Stuckler & Nestle 2012; FAO 2017) that far-reaching changes in the structure of the food system are needed if social objectives are to be realized. The essence of this is that the current trends of increasing concentration and industrialization of the food value chain must be transformed to achieve an environmentally restorative system of production controlled by a much wider proportion of the population. At a southern African level, it is widely recognized that converting struggling subsistence farms into the surplus generating small enterprises is needed in order to unlock future

employment prospects in the sector (Holt-Gimenez & Patel 2009; IFAD 2014; Filmer & Fox 2014; Aliber & Hall 2012; Stuckler & Nestle 2012; Losch 2016; ASSAf 2017 FAO 2017).

In South Africa, since 1996 the number of commercial farming units dropped from 60 900 to 39 900 in 2007. Of the current total, only 1.5% (673) of commercial farms account for a third of total gross commercial farm income (DAFF 2013; Bernstein 2013). In the food retail sector the market share of the major retail chains has risen from below 10% in the late 1980s to around 68% in 2012 (Reardon *et al.* 2003; Bernstein 2013). Similar trends exist across the food system, from milling to finance and fertilizers (Metelerkamp 2014). Despite this, Hall (2009), Aliber & Hall (2012) and Cousins (2010, 2103) stress that inclusive agricultural futures capable of turning the tide on poverty and rising inequality are possible. Collectively they point towards a potential future in which South Africa's four million subsistence farmers incrementally expand production resulting in income-generating surpluses. They argue that in doing so resources and social capital accumulate in the hands of rural (and one could argue urban and peri-urban) farmers in a bottom-up process of wealth creation. This refers to a process of egalitarian agrarian reform referred to as 'accumulation from below' – the antithesis of market-orientated 'trickle-down' developmental approaches. The theory follows that by actively promoting the emergence of a viable small-scale farming sector, the growing divide between black subsistence farmers and an increasingly consolidated white commercial sector, could be ameliorated.

However, despite identifying the need for a structural transition within the food system, none of the literature advocating for change within the food system, including the NDP, grapples with the critical question of young peoples' interest in taking up the difficult work that this will entail. This data gap extends to a regional level despite recognition that converting struggling subsistence farms into the surplus, generating small enterprises is needed in order to unlock future employment prospects for young people in the sector (Holt-Gimenez & Patel 2009; IFAD 2014; Filmer & Fox 2014; Aliber & Hall 2012; Stuckler & Nestle 2012; Losch 2016; ASSAf 2017; FAO 2017). In this paper we seek to probe this issue.

What the NDP, NYP and others (IFAD 2014; Filmer & Fox 2014; Losch 2016) highlight is that new jobs cannot be created in isolation from the wider food system in which these jobs are embedded. These jobs also cannot be pursued at the expense of long-term social justice or environmental sustainability – otherwise the challenges faced by youth in the future will be exacerbated (NPC 2012; IFAD 2014; ReNAPRI 2014; NPC 2012;White 2012; Haggblad *et al.* 2015 Minde *et al.* 2015; Tschirley *et al.* 2015; Losch 2016).

3.1.2 *ZOOMING IN ON YOUTH*

Enabling a sustainability transition within the food system is a complex, structural

project (Swilling & Annecke 2010). Such a transition will partly require responding to the youth employment crisis by supporting youth to participate in food-system based livelihoods that are socially just and environmentally sustainable. Given the complex relationship between youth unemployment, social inequality and structural shifts within the food system, there is a need to better understand how young people might be inspired and supported to actively participate in a transition towards a just food system.

However, as White (2012), Swarts and Aliber (2013) and others (Krizinger 2002; Leavy & Smith 2010; Proctor & Lucchesi 2012; Cognac 2014; Leavy & Hossain 2014; Losch 2016) have highlighted, conventional opinion identifies a confounding situation in which youths are turning their backs on jobs in agriculture despite high levels of unemployment. According to White, this apparent contradiction may stem from the way the problem has been studied in the past. In addressing this, White suggests that:

"A youth studies perspective [can help] us to understand the lives of young people and their paradoxical turn away from farming in this era of mass rural unemployment and underemployment; it also provides a reminder of the need and the right of young people to be properly researched – not as objects, but as subjects and where possible as participants in research." (White, 2012. P9)

This paper responds to the gap identified by White and others (Leavy & Smith 2010; NYDA 2015), using a narrative-based approach to contribute the first empirical data to the currently thin literature on youth attitudes, expectations and experiences of employment within South African agriculture. In particular the research applies a youth studies perspective in response to the growing body of literature calling for an improved understanding of the viability of an agricultural development agenda premised on the principles of 'accumulation from below' (Hall 2009; Aliber & Hall 2012; Cousins 2010; Cousins 2013).

3.1.3 GLOBAL CONTEXT

While this paper seeks to provide an empirical foundation for understanding youth attitudes towards agriculture in South Africa, the findings have resonance for many other countries in Sub-Saharan Africa and beyond, on the role of youth in agriculture. Accounting for 32% of employment globally, agriculture is critical for contributing to Sustainable Development Goal 8 on Decent Work. Yet, despite its importance, agriculture battles with negative stigmas and seldom tops young people's lists of career aspirations (Cognac 2014). Thus, certain insights from this paper will be important for others working on similar problems elsewhere - particularly in Sub-Saharan Africa. Furthermore, we hope that the methodological approach may support the adoption of more youth-centric approaches towards sustainability transitions in other fields.

3.2. APPROACH

The study used SenseMaker ® as a narrative collection and signification framework. Through a combination of narrative sharing and self-signification by respondents, the process produces a blend of qualitative and quantitative data well suited to the analysis of complex social phenomenon (Lynam & Fletcher 2015). The approach is founded on the assumption that individuals and societies make sense of the world through the assemblage of fragmented narratives and that in probing for narratives around a given topic, valuable insights can be gained into underlying values and attitudes (Deprez *et. al.* 2012; Kurtz 2014).

The power of the SenseMaker lies in its application as a narrative pattern-detection software system capable of making sense of individual narratives on scales which elucidate values and attitudes at a societal level (Deprez *et al.* 2012). In our case, using individual youth perceptions toward work in agriculture to create a picture of the social values common to youth as a broader national entity.

Youth were asked to share a short personal story based on the following prompt: 'Share a real or imaginary story about a time when you or another youth in your community faced a difficult decision around a career in agriculture'. Each respondent was then asked to self-signify their story based on a set of four triads, four dyads and three multiple-choice questions (for example of questionnaire, see Appendix A). This self-signification provided a more objective means through which trends in the narratives could be classified by providing a plausible alternative to analysts coding narratives retrospectively (Lynam & Fletcher 2015). Fourteen questions of a demographic and psychographic nature were also included. Data was processed using SenseMaker Explorer ®.

A target population of youth between the ages of 16 and 35 was selected from three sites, each from a distinct climatic and cultural region in South Africa; the Western Cape, KwaZulu-Natal and Limpopo province. Given the agrarian nature of the research, the sampling approach favoured rural areas with high youth population densities and a mix of traditional farming and large-scale comemrical agriculture. The Western Cape sample site was the exception. Here, a sample of urban youth living in informal settlements between urban centers and farming landscapes was taken. Each sample site was located within, or in close proximity to, agriculturally active landscapes. A non-probability based, convenience sampling approach was used in each of the three regions. This meant that the sample should not be considered as representative. The majority of interviews were conducted at home or in places of learning. Data was collected on tablets using SenseMaker Collector® and local fieldworkers were recruited in each location to provide first-language support to respondents.

In total, three teams of field workers undertook 14 days of interviews between 15 November 2016 and 4 March 2017. Seven hundred and one (701) youths responded to the story prompt and completed the signification framework across the sample sites. Of

the 701, 128 were excluded due to fieldworker errors. This provided a final working sample of 573 with an even gender distribution. The language breakdown of the sample was as follows: Tsonga 45%, Xhosa, 29%, Zulu 18%, other languages 8%. Forty two percent had one or more family member employed in agriculture, while only 13% had any form of tertiary qualification. Fifty four percent had never been employed or run their own business.

The narratives were divided into two categories: those whose narratives expressed a positive attitude towards work in agriculture and those whose did not. The triad presented in Figure 3.1 was used to assess attitudes towards work in agriculture. Stories were considered to reflect a positive attitude towards work in agriculture when they were signified as either >50% 'Regard work in agriculture as an exciting career path' or >75% 'Regard work in agriculture as a useful stepping stone to something better'. Stories were considered to reflect a lack of interest or negative view when they were signified as either <50% 'Regard work in agriculture as an exciting career path' or <75% 'Regard work in agriculture as a useful stepping stone to something better'.

Positive and negative narratives were analyzed separately using a basic textual analysis to provide qualitative context. This assisted in identifying emerging themes within each of the categories (Boxes 1 and 2).

3.3. RESULTS

Thirty-six percent (36%) of the total stories were positive with regards to agriculture in that they depicted a possible/ positive future in agriculture (206 out of 573). As per the demarcated areas in Figure 3.1; this 36% was comprised of 26% of respondents who signified youth in their stories to regard work in agriculture as an exciting career path at strength >50% and 10% signified work in agriculture as a stepping stone at a strength >75%. Negative stories represented 64% of the total, of which 21% signified work in agriculture as a means of survival at >75%. Examples of positive and negative narratives are given in Boxes 1 and 2. No significant difference was discernible between linguistic groupings.
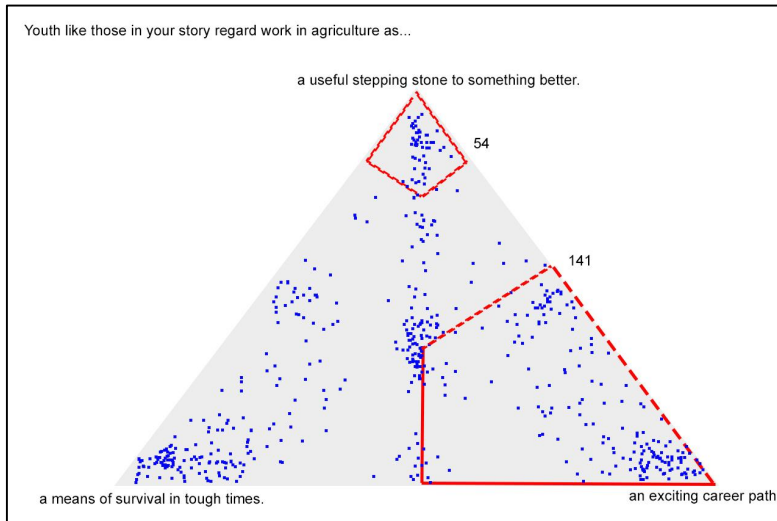
Figure 3.1: Selection of narratives considered to reflect positive attitudes toward agricultural work

TEXT BOX 1. SAMPLE OF NEGATIVE STIGMA NARRATIVES

What others will say syndrome

My friend was unemployed and the only option she had was working for someone as a gardener in the neighborhood, as time went by her peers started dissing her calling her a servant. This really affected her into such an extent where she stopped working and she stayed at home with no income and nothing to help feed her siblings.

Career in agriculture

My decision on making agriculture as a career was never easy due the people around me they used to tell me negative things about agriculture like things such [as] agriculture is for old people and I'm too young to choose agriculture as my career I then became nervous not knowing what I must do but when time goes by I've attended a youth meeting in our community and it opened my eyes wide open because I was blinded by my friends deceiving me not to go for agriculture but then I'm glad I managed to do something better for myself in agriculture.

Career with your interest

I have one of my brother who done agriculture and take a career which base on agriculture. My parents use to ask us when you grow up you want to be? My brother was supposed to fake his dreams because they will start to discourage him if he talk about agriculture by ask him questions like "where a you going to get the land to farm". He done a searcher about for them to understand some opportunities base on agricultural still not accept it. When he go to university want to do his dream career they told him they will not pay his fees, he quit.

The youth in agriculture

It was this year when I discovered that there was some young girl who was in matric and was interested in a career in agriculture. She had so many challenges as this career is not taken seriously especially the youth of today. Even her family and her peers bullied her and teasing her about taking a career in agriculture. They negatively told her about how awful and hardworking agriculture is and that she will be working in farms for the rest of her life which was not true at all. A career in agriculture is useful and an achievement to be better.

The sun can change my skin colour

They [youth] do not like agriculture as their choices because they are lazy of using heavy tools that can destroy their hands and they also look   at working at the gardens. Youth loves their bodies especially girls. They say their skin will be changed and they will become darker every day.

Abuse in industry

I once went to a certain farm to buy tomatoes, while I was there, there was a huge argument between the white boss and a worker who put wrong grades of tomatoes, she was kicked and fell on tomatoes in front of the customers, I started to have questions about working in agriculture.

Is agriculture really for grannies?

I was 17 and had to put through my university application. I sat my parents down and told them that I wanted to do farming as one of my career choices. They said no, farming was for old people and they didn't put me to school to get dirty running after pigs. They wanted me to do an office job. I had to choose between my parents funding and career.

TEXT BOX 2: SAMPLE OF PRO-AGRICULTURE NARRATIVES

Happy times
It was 2014 when I attended an after-school programme that was based on agriculture. On my own view agriculture would be good career to choose. That was one of my best years in life. We were attending the garden, learning how to plant different types of crops and pesticide. The best thing I enjoy in agriculture is animal studies. It would not be difficult for me to choose agriculture as my career.

Future Entrepreneur
There was a young male who was studying agriculture at a college and had a vision of creating an agriculture business. The challenges he faced sharing thoughts is he knew he wanted to start something in this area. Just because there's a land availability but unsure what specific agriculture business he would start up around here. Simply because the target market will be around this place and not so much people here, looks like he wouldn't make that much profit either. This was a complicated decision to make.

Fees must fall challenges
I studied the agriculture in Fort Hogs College in Alice. My interest that made me to do the agriculture is open the academy to teach our youth about farming. The job opportunities are few in SA so we need to wake up and do business but my effort to do that fell down because of fees must fall, our college end up closing down. The student burnt down all the college building and my dream not come true.

Love it at last
Personally I like working in agriculture and that started after I got a job at a local NGO here in Site C, Khayalitcha called Iliso Care Society. I didn't know anything about gardening but because I got this position here I was forced to know everything happening here in this NGO. I'm enjoying every minute I visit the guys who are more hands-on in garden.

Agriculture as career
Since 2009 about 3 of my family and friends are working as an agriculture, is giving me more power to be in agriculture industry because they always give me a strong motivation how agriculture is good in people's lives and how it helps people, so to me is very easy to choose agriculture as my career.

Agriculture is the best
Someone tried to make money in selling chickens his business went very successful and I like his style of making money to support his family now his a successful young man with so I decided to make some change of making money I want to do agriculture as a career

TEXT BOX 3: SAMPLE OF NARRATIVES REQUESTING SUPPORT

Don't have information about agriculture
I found it difficult to take agriculture as career because I don't have much information about it.my self I stay at rural area and in rural area there no much opportunity to work as agriculture and there no peaple who do agriculture that I can grab information to them

Lack of qualified teachers
I taken it as a career I face many challenges firstly at school lack teachers who teacher agriculture and motivation. I share it with my brother that I'm interest in agriculture and he told me take it even your school have teacher they will register with another school, so I was suppose to study on my own. on weekends spend lot of time in my garden to help me to understand it practical.

Fees destroy careers
There was a young girl that I know named Lulu. She grew up from a poverty family. She used to have small garden. She loved agriculture, she hope to produce more and she wanted to take agriculture to be her profession but she didn't due to lack of money.

The darkness in my future
There is a young boy called Sipho in my community, he is living with his grandfather and he liked agricultural programmers but the problem was that his grandfather could not afford to pay fees for Sipho continue with his study after finishing grade 9. So Sipho had to drop up at school he was interested in agriculture because of his grandfather, he like planting veg at his yard but the vegetables didn't succeed.

Job less
I've study agriculture at university it was a very good career path I enjoy doing it a lot while my friends were against it but I carry on finish my year but the problem came when I have to apply for a job I didn't get any job and that was painful to me and it felt like it a waste of time because my parent have faith on me now I'm sitting home with my degree but I still have hope.

Farming Is Great
It happened in summer when me and my friend intend to start a career in agriculture. We mainly targeted cattle farming when all of sudden terrible draught striked. All the heifers we invested on were moped away. We approached the government for help, we were promised to be compensated. Till now to our surprise nothing happened. We tried some follow up applications but to no success. We feel hard done by the government, the results were a failure.

Losing hope
I was involved in a chicken project, and I faced lot of challenges because I didn't have enough space, I was living in a informal settlements my chicken were dying everyday. It changed all my dreams because I gave up my dream.

The second triad provided respondents with the opportunity to specify what motivated the youth they described in their stories. Three triad points representing a personal, community and environmental perspective were provided as per Figure 3.2. The results suggest that within the context of agriculture, the desire among youth to make a good living and support their communities was strong, with interconnected motivating factors. Ninety percent (90%) of the sample indicated a preference >50% to either one or other of these nodes in the triad. A particularly strong clustering is notable adjacent to 'make a good living'. Environmental concerns were less important with only 5% of respondents weighting environmental conversation as a strong (>75%) motivating factor. These weightings were consistent with the textual analysis of the narratives.
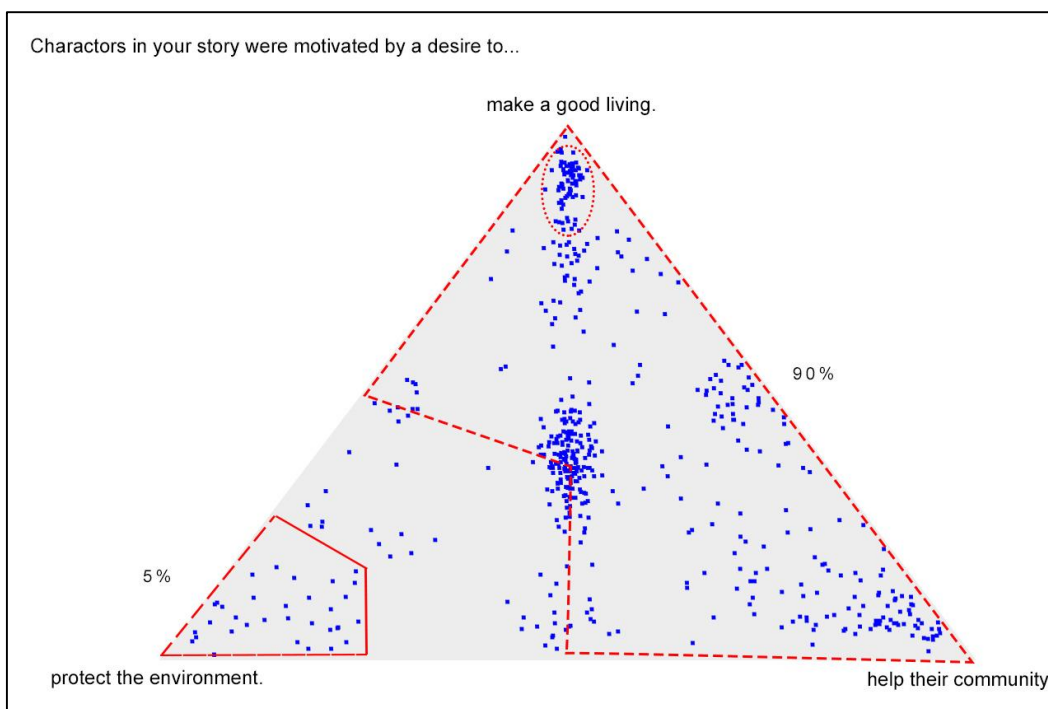
Figure 3.2: Motivating factors

Youth in your story were hoping to...
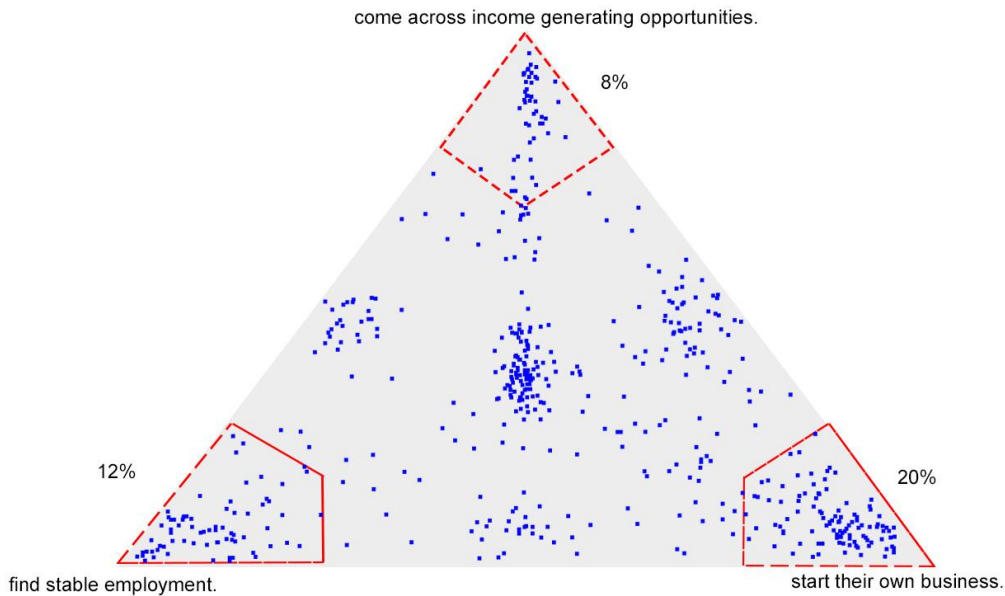
Figure 3.3: Career aspirations

In terms of career aspirations (Figure 3.3), responses with a preference of greater than 75% towards any given node were considered to denote strong career aspiration. This suggested a moderate aspirational preference towards starting a personal business (20%), followed by those hoping to find stable employment (12%). Those seeking income-generating opportunities came in lowest at 8%.

The difficulties youth face in making decisions about careers in agriculture relative to careers in other fields provides a useful marker in determining the extra-ordinary pressures surrounding agricultural careers. Figure 3.4 suggested choices relating to agricutlre were harder than other career fields.
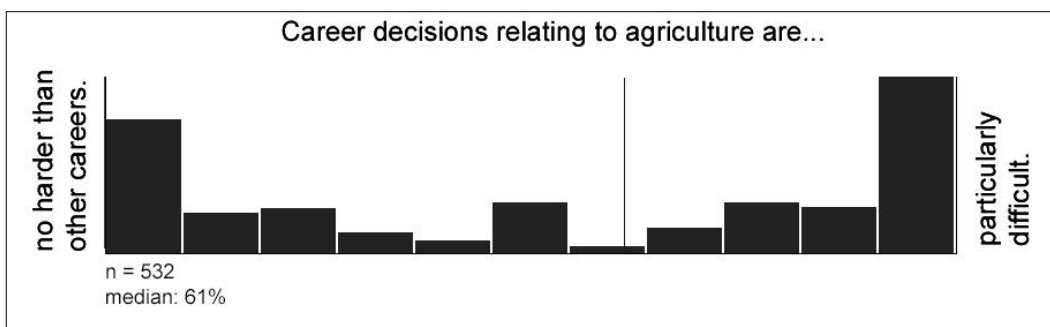
Figure 3.4: The difficulty associated with making career decisions in agriculture relative to other fields

Of the 532 youth who responded to the question, a strong cluster of 156 (29%) felt strongly that making career choices relating to agriculture was particularly difficult, and the majority (61%) associated with this statement to some degree.

3.4. DISCUSSION

For those interested in the promotion of a sustainability transition within the South African food system, this data suggests three potentially encouraging trends in the way youth think about their futures. All three carry substantial policy implications and warrant mention, as they relate directly to calls for a socially restorative process of agricultural development based on the principles of accumulation from below.

The value youth place on work with social outcomes and their interest in entrepreneurship are discussed more briefly, as they were somewhat tangential to the main objective of the study. Following this, the main question of attitudes towards work in agriculture is discussed in more depth.

3.4.1 PASSION VERSUS PROFIT

The first trend - the value youth place on work with social outcomes - is that, despite their apparent financial poverty, for many young South Africans, careers are much more than about making money (see Figure 3.2). Careers with a strong social outcome or benefit appeared to matter to many young people. Youth wanted to be seen as active agents of social transformation within their communities.

Interrogating this finding in relation to the broader literature in South Africa is a complex task given the relationship between achieving financial security and the ability to support extended social networks living in poverty in the context of collectivist cultures[5]. On the one hand, there is evidence that engagement with social issues (not to mention environmental ones) does not feature prominently in the aspirations of South African youth (Emmett 2004; Mattes 2012; Swartz et al. 2012). Swatz et al. (2012) in particular, speak about the relationship between youth's narrow focus on making money and their ability to construct a sense of identity and belonging through material accumulation of consumer goods.

Swartz *et. al.'s* position, which may be indicative of broader assumptions on

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[5] Because collectivist cultures emphasize people's interdependence within the group, people's behaviour is largely regulated by group norms rather than personal attitudes (Vogt & Laher 2009).

contemporary youth culture, appears to run contrary to our findings in two ways. Firstly, our data indicated that, for many youth, providing assistance to their communities was more important than making a good living (see Figure 3.2). Secondly, the non-financial social outcomes accruing from work in agriculture appeared to assist youth to craft a sense of identity and belonging within local and national narratives.

Matlala & Shambare (2017) offer a perspective that provides some support in bridging Swartz's findings and our own.

Matlala & Shambare (2017) use the term 'Black Tax' to define the societal expectation, which translates to a social norm, that employed black South Africans provide financially for their extended family networks living without income. It is seen as an additional social-welfare tax which white people in South Africa are not subject to due to the comparative financial security of their family networks. They argue that the motivational dynamics around so-called 'black tax' have not been sufficiently understood, and that the shared social value accruing from youth's income-seeking activates in South Africa is often antecedent of the pursuit of financial incomes (Matlala & Shambare 2017). This is a point we return to later in the paper as we consider negative stigmas around agricultural careers, but for now, accepting Matlala and Shambare's position suggests a very natural fit between youth's stated desire to make a good living and to help their community.

3.4.2 ENTREPRENEURIAL ASPIRATIONS

The second potentially encouraging trend when considering the prospective role of youth in expanding the small scale farming sector is that many youth clearly aspire to starting their own agricultural businesses in spite of the lack of skills, role models and resources.

In saying this, it is important to differentiate between what youth may like to imagine themselves doing, and the reality of incubating small-scale businesses in South Africa. Overall, South Africa's entrepreneurial track-record for small enterprises remains poor (Herrington *et al.* 2010) and there is evidence to suggest that youth with little exposure to career guidance or opportunities tend to attach their ideas to the most remunerative career options visible to them, often with little connection to the reality of what is required to achieve these dreams (Swartz *et al.* 2012). The notion of having a dream and following it came up repeatedly in the narratives youth shared. However, in considering the dreams and aspirations of youth, Swartz *et al.* warn that despite the generative aspects of big dreams, many young South Africans display a 'willingness to operate on wishful thinking' (Swartz *et. al.* 2012, p9). Swartz suggests that through this common practice of wishful thinking, insufficiently rooted in a pragmatic appreciation for the present, youth are bound to fail.

In light of the above, there is clearly a need to interpret the social orientations of youth and their entrepreneurial aspirations with caution. However, considered in parallel with the strong interest in agriculture, discussed in more detail below, the fact that entrepreneurial dreams rooted in some form of complex social orientation are a feature of many young peoples' visions for themselves is cause for some optimism.

3.4.3 *EXPLORING YOUTH ATTITUDES TOWARDS WORK IN AGRICULTURE*

Speculation that youth are, as a whole, not interested in agriculture was not supported by this research. While many stories did reflect negative attitudes towards agriculture and a lack of interest in the sector, 36% of the story respondents reflected positive perceptions and an interest in careers in the sector. This raises two questions:

- Are negative attitudes towards agriculture different to attitudes towards other sectors such as engineering or the arts, for example?
- With so many youth displaying an interest in agriculture, does it matter that many others are not interested?

Negative stigma around agriculture appears to be particularly pronounced and carry a social aspect that extends beyond a basic lack of interest or aptitude one would expect for other sectors. Themes from the narratives emerged around agriculture being for the poor, the dirty and the elderly on the one hand, or simply for white people[6] on the other. Agriculture was perceived by many as a risky career path that involved a lot of hard work for little financial reward. A range of narrative clusters also emerged that spoke to some of the specifics of the stigmas and disincentives around work in agriculture (Textbox 1, Figure 3.4.). An example of this among female respondents was a cluster of stories making specific reference to the impact which working outside had on the colour of their skin. Considering these factors, it is unsurprising that 61% of respondents felt that it was harder to make career decisions relating to agriculture than other careers (see Figure 3.4).

The stories youth told suggest that this negative perception mattered to those who were interested in agriculture for a number of reasons. Particular among these were themes of peer pressure, shaming and substantial family pressure when considering agriculture as a career choice. However, given these social pressures, the fact that over a third of stories presented reflected positive sentiments towards work in agriculture beyond the ability to support basic survival, suggests two things:

Firstly, that despite social stigma and negative attitudes, the agricultural sector still has

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[6] The dominance of white farmers in agriculture is largely a result of South Africa's recent history with apartheid.

a very important role to play in the lives of youth in South Africa. Even for those who do not perceive it as an exciting long-term career path, agriculture represented a stepping-stone to other goals to some, and an important survival strategy for others. This appeared to hold true for both rural and urban youth.

Secondly, the fact that just over a quarter of respondents signified their stories to indicate that youth see agriculture as an 'exciting career path' in spite of powerful, deep-seated social stigmas points towards a degree of intent and fortitude among youth that should not be ignored. For many youth, agriculture really is simply not an option, representing something that "is not cool". However, in contrast to this, a substantial group of youth exist who see a generative future for themselves in the agricultural sector. In the regions where the study was based, this pro-agriculture sentiment could represent more youth than even the most optimistic job creation targets set by the NDP could accommodate. Once again, this was not limited to rural youth. Agroecologically orientated urban farming movements seem to be drawing increasing youth attention too .

3.4.4 CONCEPTUAL FRAMING OF EXPERIENCE OF SOUTH AFRICAN YOUTH INTERESTED IN AGRICULTURE

The apparent interest of youth in agriculture and the struggles many seem to face in attempting to craft careers for themselves within the sector leads to two questions: Where do they feel support is needed most, and how should these calls for support be understood?

A textual analysis of the narratives among interested youth suggested that, by and large, youth experienced a relatively common set of deficiencies as they progressed along an agricultural career pathway. As reflected in Text Box 3 above and Figure 3.5 below, these ranged from a lack of awareness and career information at earlier stages towards more practical resource- and information-related concerns the further their career path progressed. Their desire to progress along an agricultural career path appeared to be motivated by a range of practical and emotional factors, which persisted in spite of an underlying set of demotivating social pressures towards agriculture and youth in general.
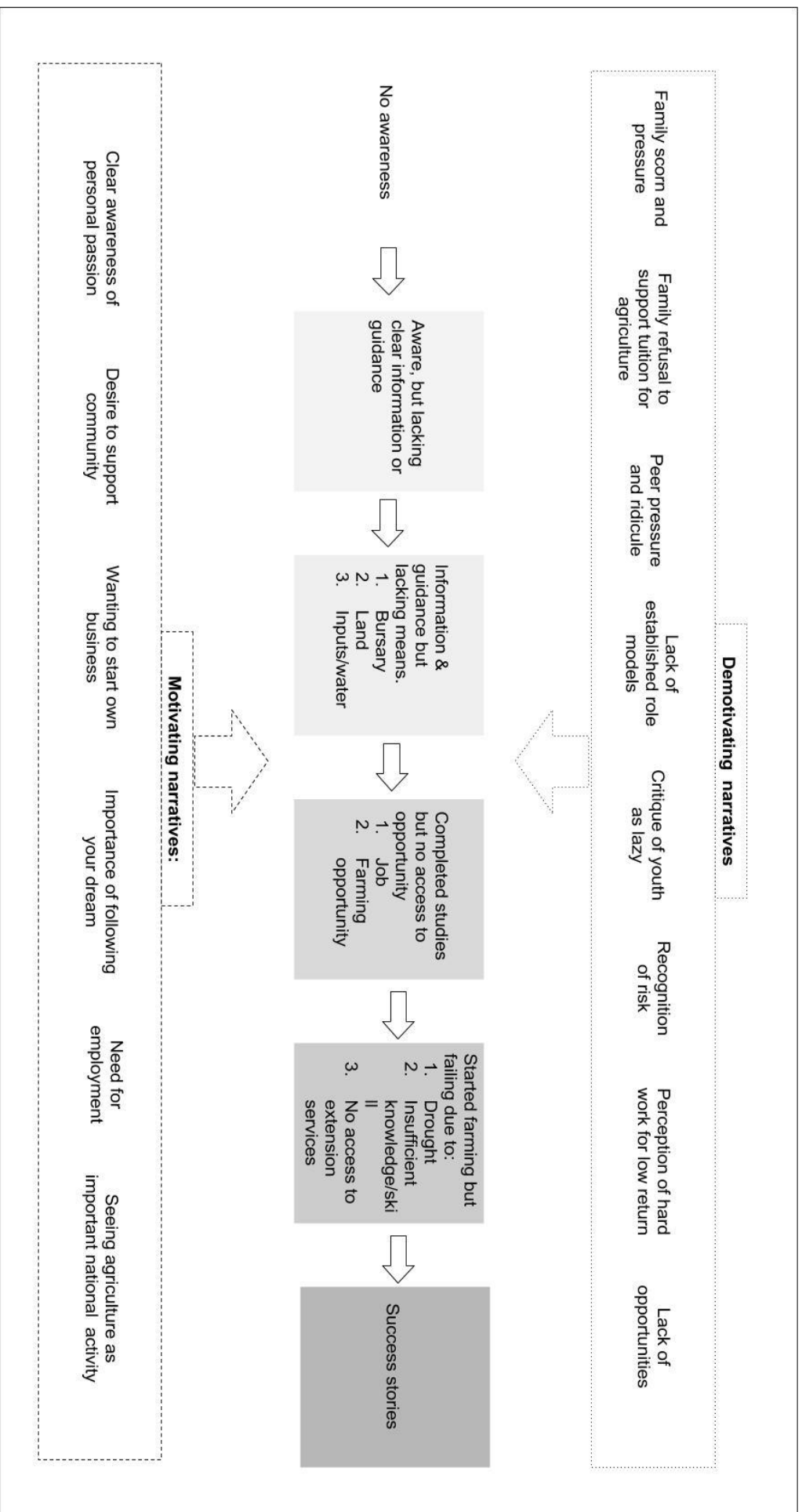
Figure 3.5: Conceptual synthesis of youth experiences as they pursue careers

3.4.5 LINKING YOUTH NARRATIVES TO CALLS FOR FOOD SYSTEM REFORM

In responding to the NDP statement that the 1 million jobs targeted in agriculture will not be met under the current structure of the agricultural sector, as well the NYP's call for the engagement of youth as active champions of their own development, this research suggests the following:

Firstly, that although many youth *aspired* to owning their own businesses, conventional employment by either the state or the 'white' commercial farming sector is, in reality, where most youth *expect* to find careers in the agricultural sector.

Secondly, a prominent set of narratives emerged around people who had strived to start their own agricultural enterprises. However, within this set of narratives, very few stories of success emerged. Stories were about those who had tried but failed. Within this set of narratives, there seemed to be an expectation that the state was largely responsible for supporting the establishment of these farming enterprises.

There are a number of potential warnings that can be identified from this. Of particular importance to the focus of this paper, are the potential dangers of marketing agriculture as a career to youth in the absence of a structured process for the localization and de-monopolisation of the food system. The notion of 'following one's dreams' featured prominently across the narratives collected and linked in many cases to the need to feel relevant to one's community and country (see Figure 3.5). However, despite their power, the dreams of youth are a dangerous currency to deal in. Swartz *et al.* observe that:

> [By] dealing in dreams, young people in the country's townships appear to be writing themselves into the nation's narrative by constructing their own sense of opportunity and, thereby, belonging. Yet the deferment of dreams in many of these young people's lives can have devastating social consequences (Elder 1998) and failed dreams can even return as a form of violence against young people, excluding them from the nation, citizenship and the possibility of belonging that they so desire. *(Swartz* et. al. *2012, p33)*

We assert that without substantial reform to the highly consolidated nature of the food system, the only realistic trajectory for agricultural employment for all but a tiny fraction of the most privileged youth is that of a low-skilled wage-worker in an increasingly large-scale agri-food industry in which they have no agency. These are jobs which some narratives referred to as 'slave labour'. In a review of the agricultural skills landscape in Southern Africa, Minde *et al.* (2015) noted that 90% of South Africa's employment opportunities in the agri-food sector required *at most* high-school graduation. The supposedly 'advanced' nature of the South African food-system and the 'flat' nature of the employment pyramid are cited as reasons for this (Minde *et al.* 2015, p114). However, when considered from a youth studies perspective, this humiliating

career trajectory is unsurprisingly fundamentally incompatible with young people's visions for their own futures.

To elaborate on this, youth exiting a failing school system struggle to achieve the pass-marks required for basic agricultural training at a tertiary level (Spaul 2013, NYDA 2015). The fraction that do manage to qualify for entry subsequently battle to fund their studies at these institutions (Le Grange 2016, Cloete 2016). The narratives shared by youth in our study suggested that, on graduation, many of these youth fail to find work or start their own farms. This points towards a fundamental mismatch between the agricultural careers of graduates' aspiration, training opportunities and available employment opportunities.

Weak professional networks, lack of career guidance and poor work-readiness among youth with little to no work experience may also contribute to the challenges of securing private sector employment (NYDA 2015). These challenges appear to leave the state as the primary employment destination in the minds of agricultural graduates, despite its very limited capacity to absorb inexperienced graduates. Put bluntly, expecting a significant number of currently unemployed youth to be absorbed as formal employees into agriculture in the future is not realistic given the current structure of the food system and long-term agricultural employment trends (Venter 2016). Expecting them to be absorbed as agricultural employees in ways which resonate with their sense of dignity is even less realistic. Adopting a youth-centric approach to growing employment opportunities within the framework of the existing food regime will not change this (Losch 2016). This infers that transforming the experience of youth in agriculture requires a substantial transition within the structure of the food system.

In considering food-system transformation, Aliber and Hall (2012), amongst others, (Holt- Gimenéz & Shattuck 2011, Cousins 2013, ReNAPRI 2014) have argued extensively for an approach that recognizes the limitations of big-agriculture and supports rural accumulation from below. The perspectives and experiences of youth provided in this research support this approach and clearly indicate fertile ground among youth for such an approach.

3.5. IMPLICATIONS

Through their narratives, youth also clearly communicated their needs within the sector. While a wide number of suggestions and requests emerged from the 573 narratives which were collected. With a few exceptions, these could broadly be grouped under four main themes:
  (1) Career guidance and information at school level to assist them in making informed decisions about their futures;
  (2) Support to study agriculture and other related fields;
  (3) More job opportunities in the sector; and

(4) Better support in the form of start-up inputs, extension services and drought relief to those who do start their own farms.

Indirectly this suggests the following three points:

3.5.1 THE IMPORTANCE OF MENTORS AND ROLE MODELS

Firstly, more role models and mentors are needed who are visible to aspirant youth and are able to provide guidance and support. Beyond the need for local actors who can serve as beacons as youth attempt to navigate difficult career choices, there appeared to be a need among youth for role models who could demonstrate that their aspirations were not simply unrealistic fantasies. The importance of mentors is widely recognized across many fields (Allen *et al.* 2004; Gibson, 2004), and is particularly important in terms of building civic engagement (Emmett 2004), entrepreneurial competence (Bosma *et al.* 2012) and context-specific agricultural success (Haggblade *et al.* 2015).

However, because successful growth into livelihood-level farming is highly dependent on emotional and financial support from intimate support circles (as shown in Chapter 4), the importance of visible role models also needs to be considered in light of the dynamics between youth, their peers and their parents. Insights from our data into the pressures youth face from their immediate community suggests that agricultural career guidance through high school may be as much about directly supporting youth as it is about sensitizing the communities on whom they rely. Matlala & Shambare's work into the notion of 'black tax' in South Africa suggests that youth's dreams and passions are, quite often, subservient to the family's expectation to provide for them financially. The expectation is that the family be paid back for time and money spent raising young people.

This may go some way toward explaining the intense pressure some youth faced from their families *not* to pursue agriculture despite their stated interest and satisfaction they derived from it. This reiterates the need to focus on sensitization and career guidance that considers the communal context in which the career decisions of youth get made, particularly in more traditional rural areas.

3.5.2 PIONEERS NEED BETTER STATE SUPPORT

Secondly, improved support and investment into what appears to be a relatively prolific set of aspirant micro-farmers and agricultural entrepreneurs are needed to ensure that a viable and vibrant alternative to the large-scale monopolistic agricultural sector is able to emerge. The fact that this is appearing already, in spite of a dearth of official support, is testament to the viability of these forms of production (Okunlola *et al.* 2016) as well as to the scale of what could be achieved with a substantial ramping-up of context-sensitive support (Okunlola *et. al.* 2013, Fan, *et al.* 2013). While a review of the extensive body of literature on how to support the emergence of smallholders is not the intention of this paper, Aliber and Hall's (2012) work to which this paper refers

extensively suggests that spending to improve shared infrastructure and extension support in just a few regions where the majority of smallholders are concentrated, as opposed to trying to invest into specific farmers across the country, may be the most effective means of investing limited financial resources.

3.5.3 *NEW APPROACHES TO SKILLS DEVELOPMENT AND COMMUNAL LEARNING*

Thirdly, methods of grassroots learning and information sharing are needed that are capable of transcending education and extension services beset with long-term structural challenges. A growing body of work around peer-to-peer learning as a model for agricultural extension has emerged which points toward this approach (Gwandu *et al. 2014;* Kelly *et al.* 2017). The narratives collected from youth corroborate current literature that suggests the current education system is failing in terms of the quality and relevance of education it delivers, while at the same time being crippling in terms of the costs of tuition (NPC 2012; Spaul 2013; NYDA 2015). Similarly, while much has been written about the revival of the state-led extension service, few gains have been made in practice (ASSAf 2017).

It seems clear that agricultural curricula, at both school and tertiary level, need to be focused on the skills youth need to realize careers as farmers on small to medium farms rather than the specialized demands of the large-scale commercial farming sector.

However, if we accept that the shift from subsistence to livelihood level production is a slow process consisting of, among other things, the incremental accumulation of capital, competencies and market linkages, what does this mean for the way we train and support youth? Similarly, what would an appreciation for the fact that an agrarian transition is not something which takes place within the individual, but rather within an intergenerational family network, mean for the kinds of support we offer?

In light of trends emerging elsewhere in the educational sector (Hakkarainen *et. Al*. 2004, Capello & Faggian, 2005; Johnson & Johnson 2013; Beers *et al.* 2016; Töytäri *et al.* 2016; Quendler *et al.* 2016) we speculate that the dominant mentality of training as experienced by youth between high school and their working lives may need to make way for a less intensive but more sustained process of life-long learning which understands successful family farming as a communal competency. Providing training which helps young people and their families incrementally overcome practical challenges as they expand production and develop as farmers over decades. This implies considering training which supports the different roles various family members play within the farming enterprise and involves multiple generations within a community.

Given the increasing recognition of the power of applied, place-based learning (Sobel 2004; McInerney *et. al.* 2011; Gruenewald & Smith 2014; ASSAf 2017), our findings imply the need to consider cost-effective modes of learning that take place within rural

communities rather than at campuses in urban centers. Instead of families within an area saving to send a few individuals out to learn, there may be merit in reversing this process, instead pooling financial and non-financial resources to embed skilled resources within communities to train a wider number of people for a few weeks at a time. In this way, course content could be linked to practical examples within learners' own contexts, and while the content could be pitched at a specific audience, entire communities could, to some degree, benefit from being able to join classes and student presentations. Soil analysis could be taught based on students' own soils, watershed management on their own watersheds, etc. The Department of Higher Education and Training's proposed idea of community colleges (based in existing communal infrastructure such as schools or community halls) could be one potential opportunity for pursuing this (DHET 2013 in ASSAf 2017).

Insights from Majee *et. al's* (2017) work in Theewaterskloof region of South Africa suggests that the impacts of designing these kinds of intergenerational learning processes could extend well beyond the agrarian dimensions, with positive implications for much wider communal health and wellbeing.

3.6. CONCLUSIONS

The research provides the first empirical study into youth attitudes and expectations of agricultural careers in South Africa. Results showed that attitudes towards careers in agriculture varied greatly. While a set of negative perceptions emerged from the narratives as anticipated, over one third of respondents expressed a clear interest and passion for agriculture. This interest persisted in spite of a range of pervasive social norms and stigmas. This raises the need to begin questioning the commonly accepted truth that youth are not interested in agriculture. From a youth perspective, our findings suggest that the interests and expectations of youth are more than sufficient to warrant substantial investment into engaging them as active co-creators in the re-design of the food system based on the principles of accumulation from below.

However, at present youth's visions for themselves within the sector appear to be contrary to the current reality, in which 90% of jobs within South Africa's supposedly 'advanced' commercial agricultural sector comprise low-skilled minimum wage positions (Minde *et al.* 2015). This places youth who choose to enter the agricultural sector in a structurally conflicted position that is humiliating and contrary to their sense of internal agency. Considered in this light, the turn away from agriculture is not paradoxical, it is a sign of how far youth will go to avoid engaging in what some narratives referred to as 'slave labour'.

Accordingly, if the agricultural sector remains a source of disappointment, uncertainty and humiliation for bright-eyed youth who attempt to engage in the sector, the turn

away from the sector in the face of high unemployment is likely to continue. Given the scale of the youth crisis in South Africa and the need for a structural transition within the food system, failing to engage the passion and energy of today's youth in this challenge would be a great loss and one which society can ill afford.

3.7. ACKNOWLEDGEMENTS

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3.9 APPENDIX A. SENSEMAKER QUESTIONNAIRE

Welcome to our Sense Maker questionnaire, we'd like to invite you to add your voice to a Stellenbosch University research project which aims to improve the way that training organisations like the Sustainability Institute respond to the needs of young people in South Africa. Its an opportunity for you to share your individual experiences and ideas, so there really are no right or wrong answers.

This study is being done because we believe youth voices matter and need to be heard! However, participation is completely voluntary, so if you feel like this is not for you, that's cool too.

Also you will have the choice to keep the answers you provide completely anonymous if you like. The responses you provide in this process will not in any way influence your admission into any training programme or job position you may be applying for through Harambee.

By continuing with this survey I confirm that:
· I have had the process explained to me in a language with which I am fluent and comfortable.
· I have had a chance to ask questions and all my questions have been adequately answered.
· I understand that taking part in this study is voluntary and I have not been pressurised to take part.
· I may choose to leave the study at any time and will not be penalised or prejudiced in any way.
· All issues related to privacy and the confidentiality and use of the information I provide have been explained to my satisfaction.

This study has been approved by the Humanities Research Ethics Committee (HREC) at Stellenbosch University as part of Luke Metelerkamp's PhD research and will be conducted according to accepted and applicable national and international guidelines and principles.

Field Worker Name: _____

Location: _____

Time: _____

Date: _____

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SENSEMAKER

Think of a real or imaginary example of a time when you, or another young member of your community, were faced with a difficult decision about a career in agriculture.

Provide a short description of this event in the space below:

Please give your story a title:

Overall the tone of my story was:

Add your name and surname:

☐ Keep it nameless

Warm up example:

How do you like your coffee?

Coffee

Milk   Sugar
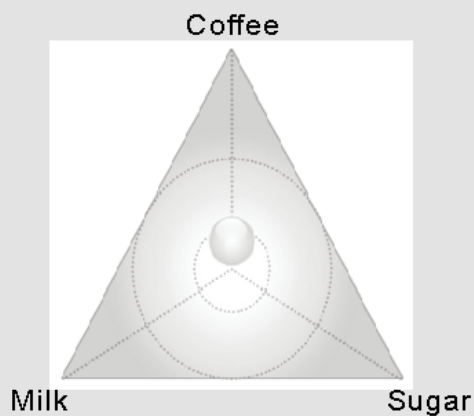
1. Black Coffee
2. Milky Coffee
3. Milky Coffee with sugar

People in your story tend to regard work in agriculture as...

a useful stepping stone to something better

a means of survival in tough times   an exciting career path

☐ N/A

People in your story were hoping to..

come across income generating opportunities

find stable employment   start their own business

☐ N/A

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Characters in your story were mainly motivated by a desire to...

make a good living
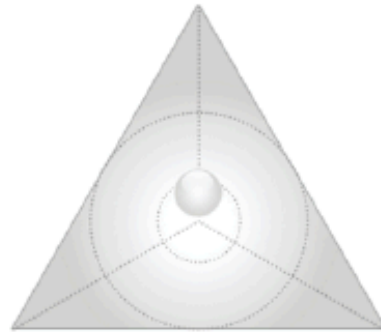
protect the
environment

help their
community

☐ N/A

The main challenges youth in your example faced were...

in their personal lives
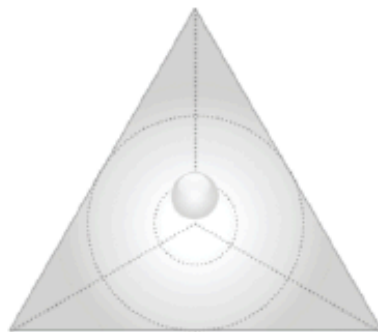
at place of learning   because of a lack of
or work   opportunities

☐ ....

SENSEMAKER

The decision in the story I decribed was challenging because...

making decisions
regarding
employment is always
challenging.

☐ N/A

making choices
around working in
agriculture is
particularly difficult.

The story I just shared shows that youth...

see no hope for
themselves.

☐ N/A

have hopes that are
completely
unrealistic.

Looking back on things, characters in my story would have done better if they...

accepted the facts
and moved on with
their lives

☐ N/A

worked harder to rise
above their
challenges.

Youth like those the ones I described in my story tend to see themselves as...

agents of change.

workers in a bigger
system.

☐ N/A

SENSEMAKER

How common is your story?

☐ Very rare

☐ Uncommon

☐ Relatively common

☐ Very common

Who do you feel needs to hear your story?

☐ Other youth   ☐ My Friends

☐ My family   ☐ The government

☐ Training organisations   ☐ Employers

Other _____

☐ N/A

Youth in your story felt...

☐ Proud   ☐ Motivated   ☐ Inspired

☐ Empowered   ☐ Calm   ☐ Lazy

☐ Overwhelmed   ☐ Depressed   ☐ Angry

☐ Ashamed   ☐ Lost/Confused

Other _____

☐ N/A

SENSEMAKER

Now just a few questions about you:

Age

○ 15-18 years   ○ 19 - 22   ○ 23-26
○ 27-30   ○ Older than 30

Gender

☐ Female   ☐ Male

☐ N/A

Home language

[---------- ▲▼]

Level of schooling completed

[---------- ▲▼]

Number of family members employed in agriculture:

[---------- ▲▼]

☐ N/A

Work history

☐ I have had a job before   ☐ I have run my own business
☐ Neither of the above

← →

7/9

I would like to be invited to participate in a feedback session with other story tellers in 2017 to hear more about the outcomes of this process

YES / NO

Contact details:

_____

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4. LEARNING FOR TRANSITIONS: A NICHE PERSPECTIVE

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ABSTRACT:

Roughly eight hundred million youth are projected to enter the African job market by 2050. This presents both an opportunity and a challenge for many urgently needed socio-ecological transitions in that region. Considering this situation from an educational perspective, two questions are raised: where will the new skills and competencies needed to underpin these transitions come from; and, given the low levels of tertiary enrolment and the slow pace of change within academic institutions, how will youth access these new competencies timeously?

This paper applies the Multi-Level Perspective as a heuristic for thinking about these questions and explores the role of emerging sustainability niches in answering them. It investigates the ways in which new skills and competencies are developed and disseminated within emerging niches. We used a network and power-mapping tool to map learning taking place within an emerging sustainability niche in the South African food system. Based on our analysis of these networks, we reflect on competency development and dissemination within sustainability niches. Initial suggestions about how the dissemination and uptake of sustainability-orientated competencies can be accelerated are also made.

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4.1 INTRODUCTION

Persistent unemployment and underemployment have become synonymous with the youth experience across most of Sub-Saharan Africa. Currently 70% of Africans are under the age of 30, and close to 800 million youth are estimated to enter the job market in this region by 2050 (Losch 2016). Of these, it is likely that less than half will have completed secondary school and no more than 10% will have completed any form of tertiary qualification (Minde *et al*. 2015). In South Africa, where the food system is supposedly the most 'developed', 50% of people under the age of 34 are unemployed and of these, 60% have never been employed (Spaul 2013). As the ranks of youth add to these numbers, the outlook becomes bleaker, particularly in a context of persistent underemployment.

At the same time, the region faces many broader social, economic and environmental sustainability challenges. These socio-ecological challenges are intricately linked to the youth question (Losch 2016), and both affect the food system and are driven by it (Folke *et al. 2002*; Nellermann *et. al*. 2009; Holt-Gimenez & Patel 2009; Alkon & Agyeman 2011; Stuckler & Nestle 2012; FAO 2017). As a key source of diverse livelihood strategies (Filmer & Fox 2014), the food system provides a significant opportunity for absorbing youth in productive activities. In some countries, the food economy accounts for as much as 80% of jobs (Tschirley *et al.* 2015). With the historically unprecedented upsurge in the numbers of young people entering the workforce, enabling a sustainability transition within the region will require supporting these youth to shift from being part of the problem to being part of the solution. Supporting youth to effect this transition, not just within agriculture but across the entire food economy, could be a major area of livelihood creation (NPC 2012; Tschirley *et al*. 2015; Losch 2016).

Acknowledging the interrelatedness of youth competencies and food system transitions, there has been a concerted call for increased investment and attention in youth skills development in the agri-food sector across the region (IFAD 2014; ReNAPRI 2014; NPC 2012;White 2012; Haggblad *et al.* 2015*;* Minde *et al.* 2015; Tschirley *et al.* 2015; Losch 2016; ASSAf 2017). If adequately conceived and executed, this renewed investment represents a window of opportunity for mainstreaming emerging sustainability innovations into the food system in order to bring about change. However, our research points to the limitations of both formal and informal learning channels in delivering the competencies required for system transitions. It's one thing to say that investment is needed to support youth skills development in agriculture, but on what knowledge do we envisage this training to be based, and where on the youthful continent will sufficient numbers of appropriately qualified trainers come from to train hundreds of millions of youth? Competency development and dissemination is a substantial transitional bottleneck requiring urgent attention. As the numbers of youth in the region rise dramatically, a youth-centric understanding of systemic transitions which draws attention to these issues is also becoming increasingly important to global socio-ecological transitions beyond the food system.

4.2 CONCEPTUAL FRAMEWORK

We apply the Multi-Level Perspective (MLP) as an underpinning theory of systemic transition for the study of youth skills development within the food system. Initially conceptualized as a heuristic framework for the study of ecosystems and socio-technical systems, the MLP is increasingly applied to the study of transitions within complex, large-scale, socio-ecological systems (Smith, Vos & Grin, 2010). The MLP provides a systems-based approach to understanding the ways in which small pockets of innovation (niches) can disrupt and transform the mainstream trajectory of a particular dominant system (regime) in the context of wider changes taking place across a given system 'landscape' – see Figure 4.1.
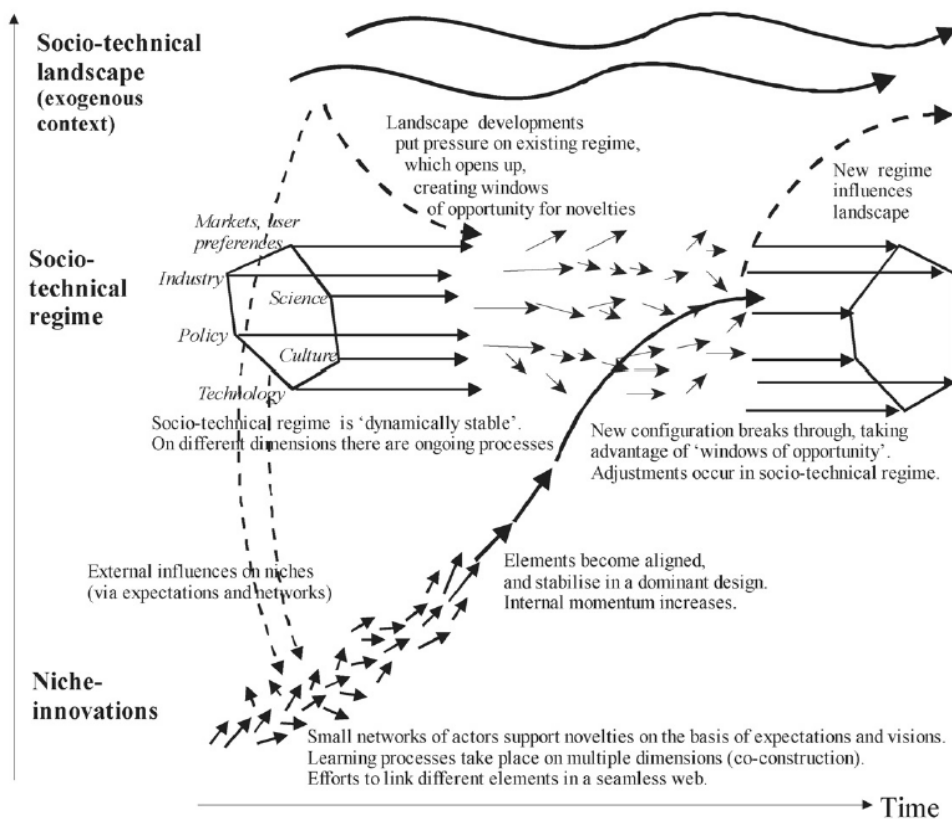
Figure 4.1: Dynamic system change over time from Multi-Level Perspective (Source: Geels & Schot, 2007).

The MLP framework emphasises how experimentation and innovation coalesce at a micro level into wider movements capable of shifting entrenched regimes at micro and macro levels. At the same time it considers how changes taking place within the macro landscape in which a particular regime exists, may create 'cracks' or 'windows of opportunity' which favour (or repel) the ability of a particular niche to shift the current regime. More recent applications of the MLP have extended to include regime resistance to change. Geels (2014) cites resistance by the current non-renewable energy regime to new renewable technologies as an example. Geels stresses the need to consider active approaches for regime destabilization when attempting to mainstream green technologies. From the MLP perspective, a systemic transition is considered to have occurred when a particular

constellation of niche practices or technologies are fully embedded into society (Genus & Coles, 2008). For the purpose of this paper, the term 'transformation' is applied to describe the process of change individual elements within the system undergo to bring about a systemic transition.

Bringing this transition theory towards practical application within the food system, an extensive body of literature characterizing the current 'food regime' has been written since Freidmann & McMichael initially coined this term in 1987 (Freidmann 1993; Reardon *et. al.* 2003; McMichales 2009; Holt-Giminesz & Shattuck 2011; Bernstein 2016). Broadly, these texts describe the current food regime as a 'Global Corporate Food Regime' (McMichales 2009, p142), characterized by the large-scale commercialization of agriculture with increasingly high levels of commodity specialization, consolidated global supply chains and widespread 'supermarketisation' of the retail sector (Reardon *et. al.* 2003). This, they argue, has risen to the fore as a result of an increasingly neo-liberal geo-political landscape, supported by cheap fossil fuels and ecological extractivisim. The tension between the prevailing food regime and a growing collection of food system niches pursuing different models of development, centred around themes of localization, food sovereignty and agroecology have been highlighted (McMichaels 2009; Holt-Giminesz & Shattuck 2011).

Important to the African context of this study is McMichael's (2009) observation that while the supermarket revolution targeting more economically affluent consumers within the current food regime has led to a proliferation of choice for some, it has also contributed to generating populations of slum-dwellers as rural inhabitants are pushed out of roles in agrarian economies. Increasingly, even believers in neo-liberal political development like the World Bank are admitting that corporate-led land investments in Africa are not fulfilling their promise of employment creation for local people (White 2012). In the words of a 2010 World Bank report, 'In many of the case studies [local people] had often suffered asset losses but received few or none of the promised benefits' (Deininger & Byerlee 2011, p33). The Regional Network of Agricultural Policy Research Institutes in East and Southern Africa mirrors this sentiment, stating that 'most types of large-scale agricultural production are capable of absorbing an exceedingly small fraction of the rural labour force, and unskilled farm labour in most cases pays very little above poverty-line wages' (ReNAPRI 2014, p3).

For the 800 million youth predicted to enter the African job market over the next three decades, there is a clear need to consider how to enable the transformation of the current food regime in ways that meet larger social and environmental sustainability goals as well as opening up new, long-term employment and other multiple livelihood opportunities for Africa's youth. As White puts it:

There are real and important choices to be made, with important consequences for the coming generations. Will young men and women still have the option, and the necessary support, to engage in environmentally sound, small-scale, mixed farming, providing food and other needs for themselves, their own society and others in distant places? Or will they face only the choice to become poorly paid wage workers or contract farmers, in an endless

landscape of monocrop food or fuel feedstock plantations, on land which used to belong to their parents, or to move to an uncertain existence in the informal sector of already crowded cities? - (White, 2012, p16)

Exacerbating this, the limited availability of non-agricultural employment means that the 'potential productivity benefits from large-scale mechanised farming are likely to be outweighed by undesirable social and equity effects.' (Deininger & Byerlee 2011, p36).

In thinking about such large-scale systems shifts, Carlsson and Stankiewicz highlight the need to consider the centrality of knowledge or competence to enable change:

'networks of agents interacting in a specific technology area under a particular institutional infrastructure to generate, diffuse and utilize technology. Technological systems are defined in terms of knowledge or competence flows rather than flows of ordinary goods and services. They consist of dynamic knowledge and competence networks (Carlsson and Stankiewicz, 1991, p. 111).

This emphasizes the centrality of the development and flow of *competence* in the transition process. Viewing systemic transitions from this networked perspective 'highlights more explicitly the importance not only of understanding the creation of technology, but also its *diffusion and utilization*' (Geels 2004. 898. Own emphasis). This emphasis on the networked nature of competence is shared by a range of pedagogical theorists (Hakkarainen *et al.* 2004; Moore & Westley 2011; Hakkarainen *et al.* 2013; Torre *et. al.* 2016) including Goodyear and Carvalho (2013) who reason that

'Competence, which is one way of describing the end goal for a learning process, rarely resides in the head of a learner. Rather a person's competence is usually entangled in, and dependent on, a set of social and physical relationships – such that an expansive view of competence includes that person's ability to assemble and hold together the entities needed for the task at hand.' (Goodyear & Carvalho 2013, p50)

Within agricultural education and extension, for example, there is growing recognition for the contribution which well structured networks of farmers, rural industry operators and experts can make to rural innovation (Gwandu *et al. 2014;* ASSAf 2017; Kelly *et al.* 2017).

From a Multi-Level Perspective, we assert that the demographic shift unfolding across Sub-Saharan Africa is a landscape level pressure on the current food regime and that it therefore represents a window of opportunity within which regime level changes to the food system could be enacted. However, if a transition towards a more socially just and environmentally sustainable food system is to be realised timeously, youth will need to be inspired, capacitated and supported to create a food system radically different to the direction in which the current one is headed.

This paper aims to investigate and shed understanding on the ways in which new competency networks evolve within emerging sustainability niches, specifically within the food system. We investigated this using a case-study approach, focusing on an emerging niche in the broader food system, namely the localised organic agriculture sector in the Western Cape province of South Africa. We mapped and analysed competency networks using a method known as NetMap. Based on our analysis of these networks, we discuss how the dissemination and uptake of sustainability-orientated competencies can be accelerated in agricultural training, and more broadly in education in Africa.

4.3 DESIGN AND METHODOLOGY

Case Study Site

The South Africa food system is at an advanced stage of transition towards a globalized corporate food regime relative to other African countries. It is increasingly becoming the launch pad for corporate expansion of the agri-food sector into the rest of the continent (Metelerkamp 2014). That country is also a relative under-performer in terms of educational outcomes and had a youth unemployment rate of around 50% in 2014 (Spaul 2013; NYDA 2015). Collectively, these three overlapping socio-political stress points (food, youth and education) provided a unique research setting, which epitomized the complex transition challenges many other countries in the region may face in the coming years.

From the equally important perspective of emerging sustainability niches within the food system, a range of grassroots movements are emerging in South Africa. These focus on agroecological production, food sovereignty and localization. The emerging coalition between these actors represents an increasingly coherent and structured set of actors who share a transformative vision for the food system. Collectively, these actors have piloted a set of radical alternatives to the dominant models of food production, distribution and retail. From a Multi-Level Perspective, this diverse coalition of farmers, retailers, community members and others, is a textbook example of an emerging systemic niche (Geels & Scott 2007).

The study of the networks of successful actors within this emerging food movement provided an opportunity to gain insight into how learning for change takes place within niches in the context of a complex systemic crisis. In order to demarcate a study boundary around a particular set of competences within this emerging network, the organic farming component of this network was selected for study. This provided a relatively well-defined sub-set within the overall network of actors.

Overview of Net-map process and theory

The Net-Map process was developed to better understand multi-stakeholder systems by gathering in-depth information about resource networks, goals of actors, and their power to influence system outcomes (Schiffer & Hauck 2010). Net-Map merges two existing methods, namely social network analysis and power-mapping. As a research method, it is well suited to

the collection of qualitative and quantitative information in a structured and comparable way (Schiffer & Waale 2008).

Net-Map enables participants within a particular system to surface and explain the diverse and often obscure spectrum of actors who exert influence over the outcome of a particular objective or process within that system. The resultant network maps indicate who the relevant actors are, the ways in which they are connected to one another and their perceived influence within the system. (Schiffer & Waale 2008, p1).

A clear prompting question is required to demarcate the boundaries of the Net-Mapping process for participants. The prompting question posed to interviewees was "Who are the actors that influence the success of an organic farmer in South Africa and how [/to whom] are they accountable?" This was posed to key informants on an individual basis.
Working together on a large sheet of paper, interviewees and the interviewer drew up a network map of the actors whom the interviewee felt influenced the success of an organic farmer. At the discretion of the respondent, each actor was classified into one of five categories: Farmer, Community, Civil Society, State and Private Sector.
Civil society largely involved non-governmental organisations supporting farmers with training and other support services. State actors reflected the different spheres of government at local/ district, provincial and national levels, and a cross-section of different state sectors from (primarily) agriculture to rural development, water and sanitation. Private sector actors tended to include local input suppliers, ethical retailers and privatized information resources. Community actors included spouses, consumers, international online forums and local families. Importantly, respondents were not unified in their classifications of actors. For example, Farmer 5 listed the "Internet & YouTube" as a farmer-based actor because they were using it to access others farmers' knowledge. Whereas Farmer 3 listed it as a community-based actor because of the general spirit in which it was created and shared.

The interviewer then guided the interviewee to establish the nature of the linkages between each of the identified actors based on a set of five pre-determined types; information, finances, resources, advocacy and authority. Respondents denoted the direction of the relationship as to/from/bidirectional. Once the actors and their links with other actors were established, the influence of these actors was established using checkers pieces to construct *influence towers*. This allowed the abstract concept of influence to be tangibly represented in a three-dimensional form. A limited number of checkers pieces were provided, so interviewees had to carefully consider who the most influential actors were.

Sample
The Net-map method was applied by individually interviewing a sample of organic farmers and related sector organisations.

A snowballing sampling process was used to develop a shortlist of 50 organic farmers in the Western Cape province of South Africa. These farmers were considered successful by their peers and related sector organisations. From this short list, five farmers, each representing a different scale of operation, were interviewed as per Table 4.1. The Net-Map process was

conducted on-farm and lasted between one-and-a-half and three hours per farmer, followed by a farm tour and broader discussion with each.

Table 4.1 List of farmer respondents

Farm Type	Years in operation	Farm size
Urban Community School Garden	1	0.1 ha
Peri-urban micro vegetable farm	2	0.5 ha
Rural vegetable farm	10	1.5 ha
Peri-urban vegetable farm	14	10 ha
Urban vegetable farm	11	24 ha

A similar process was followed for sector organisations of which seven were selected (see table 4.2). Each represented different sector elements and was interviewed for between two and three-and-half hours.

Table 4.2 List of Sector Organisation Respondents

Organisation Type	Respondent years' experience
Retail Cooperative	7
Sector Activist	7
Sector Representational Body & Training	44
Local Fresh Produce Market	25
Rural development and Organic PGS	10
Provincial Dept. Agriculture	9
Farmer Advocacy and Training	40

The twelve Net-Maps were subsequently presented to an expert panel of 25 regional and international sector representatives and farmers. Through facilitated small group engagement with the Net-Maps, this panel provided reflection on the 12 Net-Maps. Their inputs informed the over-arching analysis of the Net-Maps.

The small sample is concruent with other leading Net-Map studies (Johnson, Schiffer, Oboh & Aberman 2009, Schiffer & Hauck 2010). The should be interpreted as an interpretative and qualitative (Labaree 2009) cross-section of the most experienced pioneers in this small niche environment. Denzin & Lincoln describe qualitative interpretative research as a process

of bricolage, 'a pieced together set of representations that are fitted to the specifics of a complex situation' to present a solution that 'takes new forms as different tools, methods, and techniques of representation and interpretation are added to the puzzle' (2011, p4).

This kind of blended approach is recognised to be well suited to complex systemic problems (Swart *et al.* 2004; Teddlie & Tashakkori 2009; Flood 2010).

4.4 RESULTS

The maps varied greatly in nature. In total the respondents listed 380 actors and 880 relationships. On average, farmers listed 17 actors in their Net-Maps, while sector organisations listed 43. The level of connectivity and complexity depicted in individual Net-Maps also varied greatly. On the whole, farmers tended to list individuals and identify the factors influencing their success in simpler, more direct terms than sector organisations. Sector organisations for their part considered much wider sets of relationships, extending to as many as seven intermediary actors separating farmers from those seen to be influencing their success.

Prevalence and influence were considered in the analysis. Prevalence refers to the frequency with which an actor or category of actors appeared. Influence refers to the weighting that the interviewees allocated to a particular actor or grouping of actors.

General actors and influencers

The most influential actors in the eyes of farmers were members of their community (36%) and the private sector (24%). These two groups of actors along with other farmers were also the most commonly listed; private sector (42%), community (19%) other farmers (19%). The least influential were civil society (16%), state actors (11%) and other farmers (11%). The state and civil society were listed least frequently at 12% and 9% respectively.

The most influential actors in the eyes of sector organisations were civil society (27%) and the private sector (23%). These were also the most commonly listed at 28% and 24% respectively. The least influential were other farmer s (12%) and community actors (11%). Community and other farmers were also listed least frequently at 13% and 10% respectively.

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Focus on learning networks

The Net-Maps indicate to whom farmers turn for knowledge, as well as those to whom they do not. They provide an initial indication as to whether there are particular concentrations of knowledge and experience in the system and which specific individuals or institutions appear to be making substantial contributions to the learning taking place within the niche. Of the 380 listed actors, approximately 30% (124) were identified by interviewees as having knowledge or information flowing to organic farmers. Figures 2 and 3 provide a distillation of the farmer and sector organisation Net-Map data filtered for information exchange and

coloured by classification. Table 3 provides a breakdown of these.
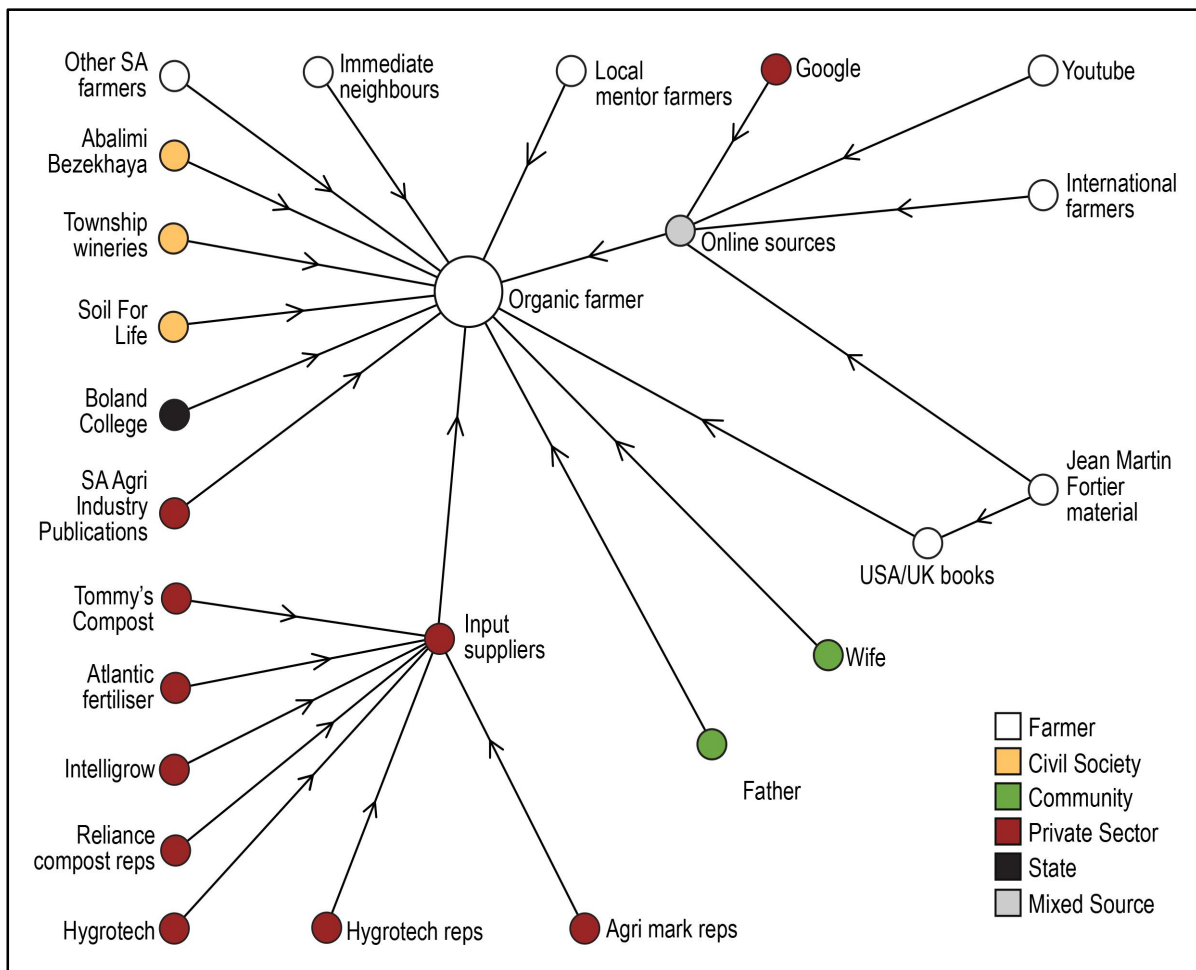
Figure 4.2: Combined network map of all actors identified by farmers as sources of information that influenced their success
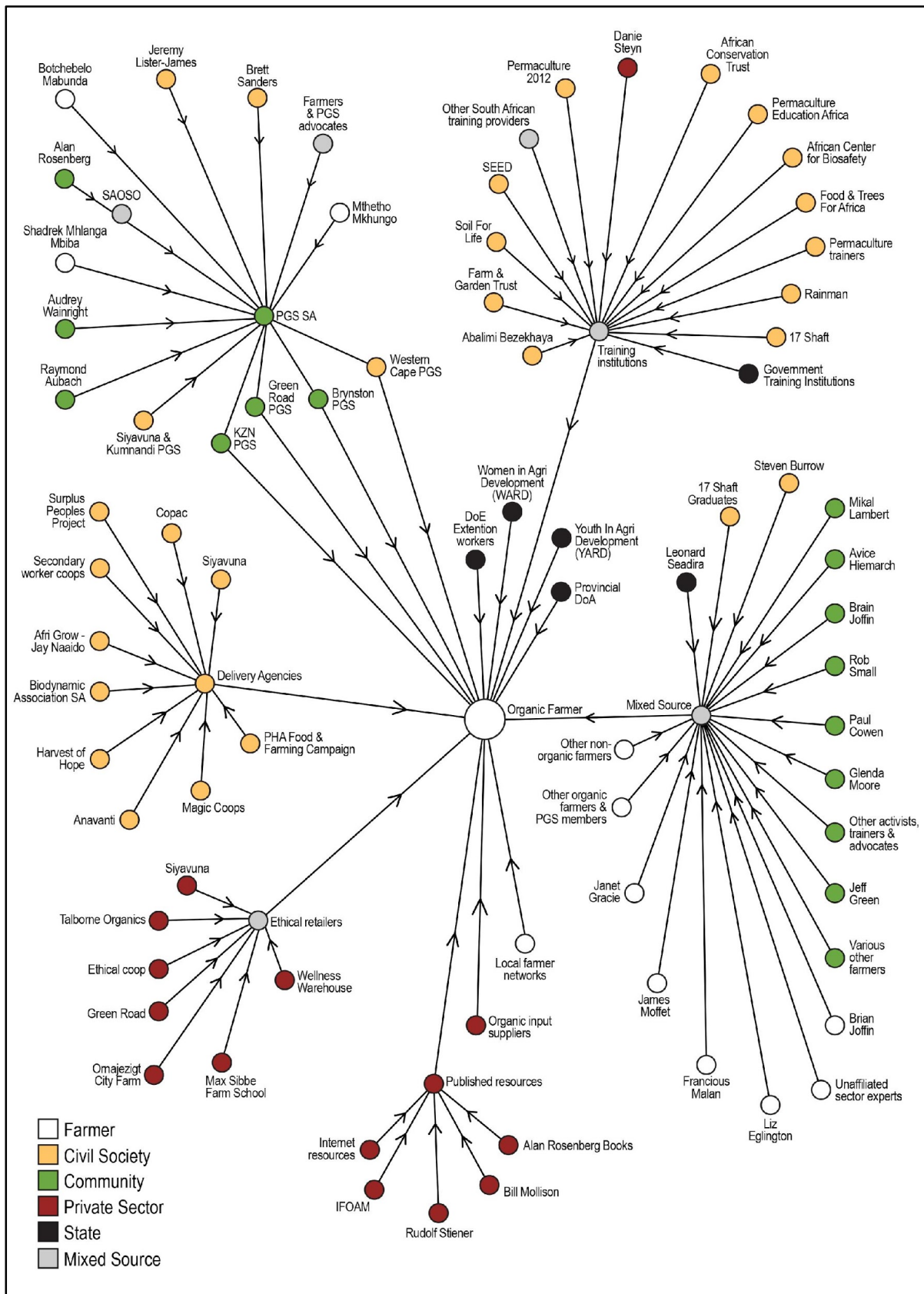
Figure 4.3: Combined network map of actors identified by sector organisations as influential information partners to farmers

Table 4.3: Information sources as listed by farmers and sector organisations

Farmer knowledge resources	Percentage	Number	Example
Private Sector	42%	10	Hygrotech Reps, Reliance Compost Reps
Farmer	29%	7	Immediate Neighbors, Other SA Farmers, Market Gardeners Success Group, Google, YouTube
Civil Society	13%	3	Abalimi, Soil for Life
Community	13%	3	Google, YouTube, Wife
State	4%	1	Boland College
Sector Organization knowledge resources	Percentage	Number	Example
Civil Society	44%	43	Western Cape PGS, Abalimi,
Private Sector	18%	18	Ethical Coop, Internet, Input Suppliers
Community	17%	17	Sector Activists,
Farmer	13%	13	Local Farmer Networks,
State	7%	7	Dept. Of Agriculture, Lenoard Sedira

Comparing these 124 relationships, the following observations can be made:

Firstly, universities and other accredited training institutions (ATO's) are conspicuous by their absence from the knowledge networks of both farmers and sector organisations. Farmers and sector organisations only made one reference to an accredited training institution in the direct knowledge/learning networks of organic farmers. Of these, only one was attributed any influence by a representative of a sector organisation. Universities featured in three of the sector representatives' maps, but not as knowledge partners to organic farmers.

Secondly, although sector organisations recognised the private sector as an important actor overall, they did not recognise its role in the knowledge and learning networks of the farmers,

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with only one representative of a sector organisation making reference to the private sector in the knowledge network. Although representatives of sector organisations recognise the private sector, it seems they may underestimate the role which the private sector input suppliers play. Similarly, they may overestimate the role that civil society plays in farmer learning.

International resources and digital learning channels featured repeatedly in farmers' views on where they sourced knowledge from. Sector organisations made some reference to these and allocated no significant influence to them.

State actors seemed to have the weakest role in farmer training and knowledge networks. Where state actors like extension officers were listed, there was some sentiment that while they had an influence, this influence was not necessarily positive due to the fact that they were not trained in organic agriculture.

4.5 DISCUSSION

As we consider the calls for renewed attention to the role of agricultural training and development for equipping youth with the competencies required to shift and sustain new systems of food production, a number of valuable observations emerge from the niche network. Considered within the MLP heuristic, these help to further our understanding of how learning contributes towards linking fragmented niche actors and coalesces over time, building internal momentum within the niche.

The data clearly indicated that well-established, formal training institutions and extension services played a very peripheral role in the day-to-day lives and struggles of pioneer farmers. In their absence, however, a rich learning network of other actors had emerged. This network comprised predominantly of other farmers, community actors, private companies and civil society organisations which collaborated (often voluntarily) to support the development and dissemination of competence within the niche. While the nature of these relationships differed according to the type of farmer, they generally comprised of a blend of physical and digital learning strategies, with the latter being global in its scope.

The new teachers: Apprenticeship in a digital world

In line with a growing body of international evidence on effective agricultural innovation networks (Hansen *et. al.* 2014; ASSAf 2017; Kelly *et. al.* 2017), information and communication technology (ICT) played an important role in the development and dissemination of competencies within the niche.

For the three farmers with good access to technology, YouTube and Google featured as common problem-solving tools for issues ranging from welding to organic pest management. Discussions with these farmers during the mapping process coupled with an analysis of the

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type of information relationships that appeared in the Net-Maps as a whole indicate that knowledge on a range of relevant subjects was very seldom acquired through formal training. Instead, active problem-solving was adopted until confronted with a challenge that they could not solve alone. At this point, very specific knowledge was acquired on-demand, for direct application to the task at hand[7]. Primarily, this knowledge was sourced from other organic farmers via searchable digital channels such as YouTube and Google, or over the phone. Farmers such as Canadian, Jean-Martien Fortier who had effectively managed to package their knowledge into clear online material featured prominently in this digital learning network. NGO's and private sector input suppliers also featured, but contact with these parties tended to involve personal visits. Learning through visits to other farms also emerged as a less frequent, but highly valuable, practice for two reasons. Firstly, these visits appeared to play an effective and often formative role in farmers' professional development. Secondly, because these visits were often undertaken communally with other non-farming actors from the network (consumers, retailers, certifiers, etc.) the visits appeared to play an important role in developing the kinds of off-farm relationships and competencies that were critical to the development of the network as a whole.

This reflected a blended[8], place-based[9] learning approach, which is low-cost, student-led, individually customisable, project-based and available on-demand. Interestingly, many of these are features that many cutting-edge tertiary institutions (Gruenewald & Smith 2014; Wiek *et al.* 2014; Zheng *et al.* 2015) and extension programmes (Moschiz *et al.* 2015; ASSAf 2017) aspire towards, but which few manage to successfully implement.

However, it was also clear that in the case-study context, situations existed where some farmers were not well-networked to those 'in the know', did not have the same levels of digital literacy (or access to data), did not possess sufficient awareness of knowledge resources, and did not have sufficient financial capital to engage in effective peer-to-peer learning. Farmers in these contexts cited a range of civil society organisations offering basic, mostly unaccredited, training as important contributors to their success.

Formal education and extension: Behind the curve

Moschitz *et al.* have noted that while innovation and learning are key to transition, the 'institutions that are charged with fostering innovation are often locked into old approaches and methods of intervention' (Moschitz *et al.* 2015, p1). Evidence from our data supports this

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[7] The two largest and most established of the five farmers clearly stated that this was a strategy that they had followed since "unexpectedly" finding themselves farming with no formal agricultural qualification.

[8] Singh (2003) defines blended learning as any form of learning which mixes various forms of face-to-face and on-the-job training with distance self-study and/or e-learning.

[9] Sobel (2004) defines place-based education is the process of using the local community and environment as a starting point for teaching. It emphasizes hands-on, real-world learning experiences and helps students develop stronger ties to their community, enhances students; appreciation for the natural world, and creates a heightened commitment to serving as active, contributing citizens.

view. Leading niche actors suggested that those they regarded as having the most valuable knowledge do not exist within accredited institutions or state-led extension service. Despite state and donor backing, the current structures of accredited training and extension appeared to be lagging behind informal (often digitised) learning networks in their ability to support the needs of agricultural pioneers.

Civil society organisations which provided training and support, such as Abalimi Bezikhaya and Soil For Life, seemed to be filling a gap for emerging Black and Coloured farmers, which, by their own admission, should be occupied by established training institutions and an effective state-led extension service (DoA 2017). In many instances these civil society organisations relied on the same set of individual sector specialists[10] as better-resourced farmers. In this sense, part of the role which civil society organisations were playing in niche learning was to act as a broker between the niche's knowledge resources and under-resourced pioneers.

This is not to say that training did not come up as an important factor in farmers' own perceptions of their development. However, where it occurred, training tended to be unaccredited and take the form of either practical short courses of a few days, or longer apprenticeships on existing farms. Only one of the five successful farmers had a formal qualification from an established training centre. What appeared to make the short courses[11] effective was that they had been offered as part of a holistic package of support that extended beyond training and involved the practical application of learning, through the production phase and into market access. This enabled aspirant farmers to start small, providing the time and support necessary for farmers to learn experientially on their own farms. Pedagogically this can be seen as an important shift away from providing training, towards enabling place-based learning.

Anecdotal evidence also suggests that formal training may have been trying to "start too big", offering courses which were too long, too expensive and appeared to prepare students for entry into the mainstream agricultural system rather than the emerging niche. Typically this either prepared students for formal employment in the commercial agriculture sector, or for entry into their own enterprise at scales which were unrealistically large and lacked effective cohesion to all the supporting services required by new farmers. Reflecting on the above within the MLP heuristic suggests the following: Firstly that the current training institutions were contributing to the path-dependency of the current regime. Secondly, the niche organically responded to this path dependency by developing alternative learning approaches outside of the mainstream system.

Pedagogical conundrum - Innovation and educational lag in sustainability niches

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[10] These specialists included other established farmers, input supplier representatives, a small number of independent trainer/activists.

[11] Examples of such courses listed by respondents were offered by civil society organisations like Abalimi Bezi Khaya and Soil For Life

Emerging niches within any social system can be considered as a collection of skills and competencies in the making (Geels & Scott, 2007; Rauschmayer *et. al.* 2015). The extent to which these ways of working have evolved will depend on the age, maturity and particular character of the niche. It will also have implications for the kinds of approaches towards training; during earlier stages more flexible, open-ended approaches may be required than at later stages. The Net-Maps from the case-study niche suggest that the necessary competencies and relationships were coming together more cohesively. As a growing number of actors begin to successfully stabilise livelihoods for themselves within the turbulent and often hostile system, the networks of exchange between these fragmented success stories becomes an increasingly valuable resource for informal learning.

Seen from a place-based perspective, which views practice within community as the cornerstone of transformative learning (Gruenewald & Smith 2014), a strong foundation for effective vocational learning appeared to be developing. However, from a traditional training perspective, particularly during early tertiary phases following high school, this fragmented and emergent knowledge landscape remains a challenging space to engage in. Curriculum development in the traditional sense is reliant on hindsight; tried and tested ways of doing things in a particular context, supported by reliable research, distilled into text books and lesson plans, then passed through accreditation bodies which ensure that what students are taught is *correct*. This in turn is taught to students by those who *know how things work,* operating within formal institutions which incur substantial overhead costs. This is a slow and bureaucratic process that is often expensive.

The scale of the youth challenge described at the start of the paper deepens the pedagogic conundrum. An attempt to work out how to fix the food system and then, over time, institutionalise this understanding so that it may be taught to hundreds of millions of youth across the continent would be futile given the scale and transitional nature of the challenge. This is particularly true given that the intention is not to capacitate youth for roles in an established regime, but rather to support them to participate in the construction of a new, and only partially defined, future.

Current accreditation structures in South Africa, as in most of the world, tend to regard learner engagement with unsolved problems as a linear process through which students progress from learning about established knowledge at lower tertiary levels, to engaging with unsolved challenges only at a postgraduate level (masters and PhD level) (Department of Education 2007). In their book, *Emergent Teaching: A Path of Creativity, Significance, and Transformation,* Crowell and Reid-Marr (2013) describe this as a limiting approach that separates students from active engagement with real world problems and limits the potential for transformative learning within individuals and society. Instead, they argue for curriculums and teaching which actively integrate principles of emergence.

'[emergent curriculums] are built upon student interests and ideas, in a purposeful, aesthetic learning environment and guided by an experiential perspective of learning. This very successful early learning approach [is] rarely continued [beyond pre-school]. In fact it is not

*until one reaches the doctoral or MFA level that this kind of learning reappears. The two of us remember the joy and rigor of these learning experiences and how transformational this kind of instruction became in our overall development.' (*Crowell & Reid-Marr 2013, p13)

In the African context, projections for tertiary enrolment are below 10% and post-graduate enrolments are even lower (Spaul 2013). As a result, the current pedagogic rationale robs all but a smallest fraction of academic elites of a chance to engage in processes of real problem-solving while enrolled at accredited training institutions. It also places this same elite at the head of solving problems from which they are almost completely experientially disconnected because they are so often problems of poverty.

In light of the need to mainstream niche innovation, this raises both a scalar and temporal challenge. It also reveals a pedagogic conundrum for educational practitioners seeking to amplify innovation and competency emerging from within niche environments: How do you teach approaches which, by virtue of their nature, have not been widely proven and lack established teachers?

In response, we argue that there is a need to build emergence into learning design while actively seeking out ways of working with the scattered fragments of what already exists within the niche networks – irrespective of how vague or diffuse this might be – in order to amplify success and begin the process of knitting together the threads of future solutions. In effect taking a networked approach to what Snowden refers to as focusing on the 'evolutionary potential of the present' (Snowden 2010, p223).

The following section takes observations from the NetMap process to explore this in more detail.

Required features of new learning models: Embracing fragmented and emerging understanding

"Drops of waters and rootlets unite! Give me your students yearning to be free! It's a simple proposition really. Bring education back into the neighborhood. Get teachers and students into the community, into the woods and on the streets closer to beauty and true grit." (Sobel 2004, p7)

The absence of established training institutions from the niche network we investigated suggests that these institutions may currently do more to perpetuate the current food regime than they do to support emerging alternatives. Given the scale of the employment and training challenges facing African youth, we see little hope for meaningful youth engagement in a sustainability transition within the food system. That is unless valuable knowledge from pioneering practitioner networks is more effectively brought into play within new broad-based training solutions and established training institutions.

Due to the nature of the youth demographic bulge in Africa and the low levels of formal education among youth in the region, new models for decentralized, broad-based competency

development are needed. These need to be capable of reaching the 90% of youth who will not make it to a formal training institution, actively supporting them build proud careers that respond to regional sustainability challenges.

Engaging learners of all levels in gritty, context-specific problem solving takes learner agency seriously. In the context of niche knowledge systems, it also avoids perpetuating an illusion of established academic knowledge that is disempowering to both students and facilitators. However, it also presents a risk of learners experiencing an overly daunting sense of being set adrift in the unknown.

This implies that in spaces of transition there is a need to consider effective approaches for teaching students how to develop competency within murky and fragmented niche environments. As suggested from our pairing of literature on place-based education with the 12 Net-Maps, this should include learning how to seek out and assemble constellations of partial knowledge from a broad and dynamic network of local and global sources[12]. Our interpretation of the Net-Map data implies the need to focus on methods of street-smart knowledge acquisition and validation which prioritise; personal and organisational relationships, peer-to-peer exchanges, internet-assisted problem solving, and links to carefully selected private sector input suppliers. This supports Goodyear and Carvalho's (2013) assertion that a person's competence is highly dependent on their social relationships as well as their ability to assemble and coordinate the entities needed for the task at hand.

Pursuit of a networked conceptualization of competency implies that students, and in particular those in niche environments, need to be learning about how to foster, develop, and maintain effective learning networks for their local contexts. For example, knowing who to go to for what, and how to structure requests for information in ways that make it simple and rewarding for network actors to support them. These are, in many ways, highly specialised soft-skills that should not be assumed to exist. In much the same way that previously unemployed youth on a learning trajectory toward stable employment in established sectors may need coaching on how to prepare for job interviews, entrants into niche environments need to learn to develop effective learning networks.

Similarly if graduates are expected to be adept at sourcing knowledge from unconventional sources, there is a need for those supporting youth to take into account the resources students from disadvantaged backgrounds require in order to learn how to develop effective networks. For example, weighing up whether access to mobile phone data should take priority over things such as library access.

While we argue that it is important to focus on alternative learning models, established training institutions clearly need to remain part of the transitional movement. In order to accelerate sustainability transitions through the incorporation of valuable niche competencies into mainstream education, these institutions may benefit from seeking ways to

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[12] The use of Netmap as a context specific anchoring device emerged as one potential method which could be used to support this.

constructively leverage the transformative potential of incomplete-knowledge in niche spaces at high school and undergraduate level. At the same time, established institutions may need to improve their ability to work with the latent and fragmented practitioner knowledge that does exist. This is likely to include embracing the fact that very often those most qualified to teach will never have been to university themselves and hold no formal qualifications.

4.6 Limitations

Limited focus to the agricultural segment of the niche system
The niche mapping focussed primarily on the agricultural component of the wider food system niche. From an employment perspective there are a wide range of other career options in emerging niches in the Agri-food system beyond the on-farm jobs - specifically in alternative retail, organic input supply and food processing. Understanding these other opportunities could go a long way to increasing the number of youth able to align their personal interests and aptitudes with careers in the niche food system. Broadening opportunities for youth engagement in food system transitions in this way is likely to be critical in catalyising change.

The Net-Map may overlook a number of foundational and soft skills

Basic skills such as numeracy and literacy were largely assumed to exist as a default condition among respondents. Given the low levels of functional numeracy and literacy in South Africa, this methodological omission needs to be considered during the interpretation of results. Similarly, soft skills including interpersonal skills, personal professionalism, time keeping, entrepreneurial aptitude and self-awareness are also key to success of any small enterprise. For many unemployed youth, these skills are a persistent challenge (NYDA 2015). By the very nature of selecting leading system pioneers to determine the influential actors that affect their success, the inherent soft skills which these pioneers entered their farms with are overlooked.

4.7. Future Reseach

Socio-technical transition frameworks such as the MLP and SNM have articulated the need to consider the ways that niches cross scales and influence the wider system. Currently, the niche food system that was studied reflects a tiny fraction of the total South African food system (INR 2008) and remains largely unsupported by the prevailing institutional funding and support instruments. However, in spite of this the niche was an important site of sustainability innovation and social learning. This raises two questions:

1. With well-placed institutional support and long-term investment, how much more could be achieved?

2. What would a roadmap for achieving this look like?

Future research in this direction could bring together theory and the limited body of empirical research on niches that have successfully challenged the regimes under which they operated, and pair it with an in-depth study into the needs of the alternative food system in South Africa.

An overarching objective of this would be to develop an inclusive and systematic framework to guide coherent and ambitious funding strategies into potentially transformative food system niches.

4.8 CONCLUSION

Three observations emerged from the organic sector Net-Maps. These assist in developing an understanding of how valuable competencies developed within sustainability niches as well as how these niche learning spaces could be more effectively supported in challenging unsustainable regimes.

Firstly, within the case study niche, a substantial volume of valuable new knowledge had been generated. This ranged from knowledge about local adaptations of crop rotation practices and cost effective approaches to certification at a farm level, all the way through the system to the development of new retail models and approaches to local community engagement. However, this knowledge appears to reside in fragmented pockets of partial completeness, distributed across the system among local practitioners. In this way, niche development is hindered by low levels of systemic awareness about what is known and who knows what. The frequency with which specific actors were identified across the twelve Net-Maps, as well as the number and nature of connections attributed to them also suggests that a small number of key actors play a vital role in ensuring that new solutions which emerge in one part of the system are connected to other actors who need them.

In the exceptional cases where leading food system pioneers had managed to document and publish their experiences this had a considerable impact. For example, the video tutorials and downloadable textbook based on Jean-Martine Fortier's highly successful 1.4ha farm in Canada featured more prominently in the organic farmers' knowledge networks than all of South Africa's large agricultural universities combined. These highlight, as countless others already have, the importance of peer-to-peer learning and the role of ICT's in supporting agricultural innovation (Lewis & Aarts 2011). It also indicates the critical need to focus on ways of supporting niche pioneers to record and disseminate their new knowledge quickly and effectively to a much larger audience. We see a clear role for traditional universities in this process.

The second observation in relation to the existing flow of competence was that beyond niche practitioners, few established teachers and experts existed. These practitioners also tended to be in the process of working out solutions themselves rather than having them at hand. While these practitioners may aspire to teach, they appeared to have extremely limited time available to do so. Practitioner interviews as well as feedback from the expert panel both cautioned against placing additional teaching demands on niche pioneers who are often already stretched beyond capacity. This type of human resource pressure has been noted as a common transitional challenge as niches begin to mature (Moore *et al.* 2014*).*

Thirdly, the origins of knowledge that was useful to those within the niche tended to be

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associated with long-standing practitioners rather than research institutions or extension services. This knowledge was hard won through economically risky, on-farm experimentation. In this sense, practitioners and at times the private companies that supplied them on a day-to-day basis were at the forefront of the sustainability innovation curve.

In summary, the development and transfer of competency within the niche network appears to be impeded by the absence of teaching capacity and institutional support combined with the fragmented nature of knowledge. This in turn hinders the niche's ability to carry hard-won lessons and solutions forward into a regime-level transition. However, a substantial volume of knowledge had already been generated and sophisticated informal learning networks existed. Unfortunately, the existence of a network does not ensure that the impact of knowledge it bears will successfully cross the scales and boundaries required to achieve systemic transitions (Moore & Westley 2011). The power within the network needs to be purposefully wielded to ensure the niches do not remain trapped at the fringes of their systems. Investment that supports sustainability niches to structure, record and disseminate their knowledge with greater ease and to much wider audiences may represent a valuable opportunity for accelerating sustainability transitions.

In pursuing this, creative approaches will be required capable of effectively bridging the gaping divide between the many tiny pockets of niche knowledge and the 90% of youth in Africa who will not make it to formal tertiary training.

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5. Net-Map: A frontline tool for supporting place-based learning in sustainability niches

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5.1 INTRODUCTION

It has been extensively argued that sustainability transitions are dependent among other things on the development and diffusion of new competencies. A transition to a global food system based on principles of social and environmental justice, for example, will rely on vast numbers of (predominantly young) people learning how to farm, trade and self-organize in new ways (Yeboah 2018). The prevailing notion that learning for these kinds of transitions will be led by universities, technical colleges and other similar training institutions is a pipe dream and will not hold true for much of the Global South. Of the 800 million youth projected to enter the job market in Africa over the next 30 years (Losch 2016), only 10% will have a tertiary qualification (Minde *e. al.* 2015, Darvas 2017). To say nothing of the type and quality of skills the 10% acquire in tertiary training, the far bigger question is really: *What about the other 90%?* Accepting this 90% will not be formally trained, how then do we consider engaging this overwhelming majority in the imagining and construction of a better future?

This simple question highlights the need for increased research into potentially radical alternatives to the existing capacity building platforms to take us beyond reliance on the formal training sector. It also highlights the need to begin thinking about how to increase the dissemination and diffusion of knowledge and competencies from within emerging sustainability niches; particularly in the Global South, but also in the North.

Theorists from across the fields of sustainability transitions, pedagogy and complexity, increasingly argue for the need to take a networked view on the development and diffusion of competency at an individual and societal level (Carlsson & Stankiewicz 1991*;* Reed *et. al.* 2010; Goodyear & Carvalho 2013; Lotz-Sisitka *et. al* 2015; Kelly *et. al.* 2017; Wals *et. al* . 2017). Concurrently, there is an increase in voices calling for more place-based approaches to learning which embrace the notion of learning through context-sensitive practice (Smith 2002, Sobel 2004, Gruenewald & Smith 2014; Vallabh *et. al.* 2016; Shannon & Galle 2017). This place-based approach asserts that using students' local community and environment as a starting point for learning increases academic achievement while developing a heightened commitment to serving as active, contributing citizens (Sobel 2004).

In response to the pressing need for new approaches, we see a role for increased attention to new methodological tools for curriculum development - methods capable of translating place-based pedagogies into practice at a grass-roots level where institutional capacity is weak and educators themselves lack the very skills they strive to pass on to their students. This work is inspired by our own experiences as teachers and facilitators working within sustainability niches over the past decade. In our experience, bridging the divide between the competencies we knew needed to be taught and the teaching resources at our disposal was a continuous struggle.

5.2 CONCEPTUAL FRAMEWORK

We apply the Multi-Level Perspective (MLP) as an underpinning theory of systemic transition for the study of youth skills development within the niche environments. Initially conceptualised as a heuristic framework for the study of ecosystems and socio-technical systems, the MLP is increasingly applied to the study of transitions within complex, large-scale, socio-ecological systems (Smith, Vos

and Grin, 2010). The MLP provides a systems-based approach to understanding the ways in which small pockets of innovation (niches) can disrupt and transform the mainstream trajectory of a particular dominant system (regime) in the context of wider changes taking place across a given system 'landscape' – see Figure 5.1.
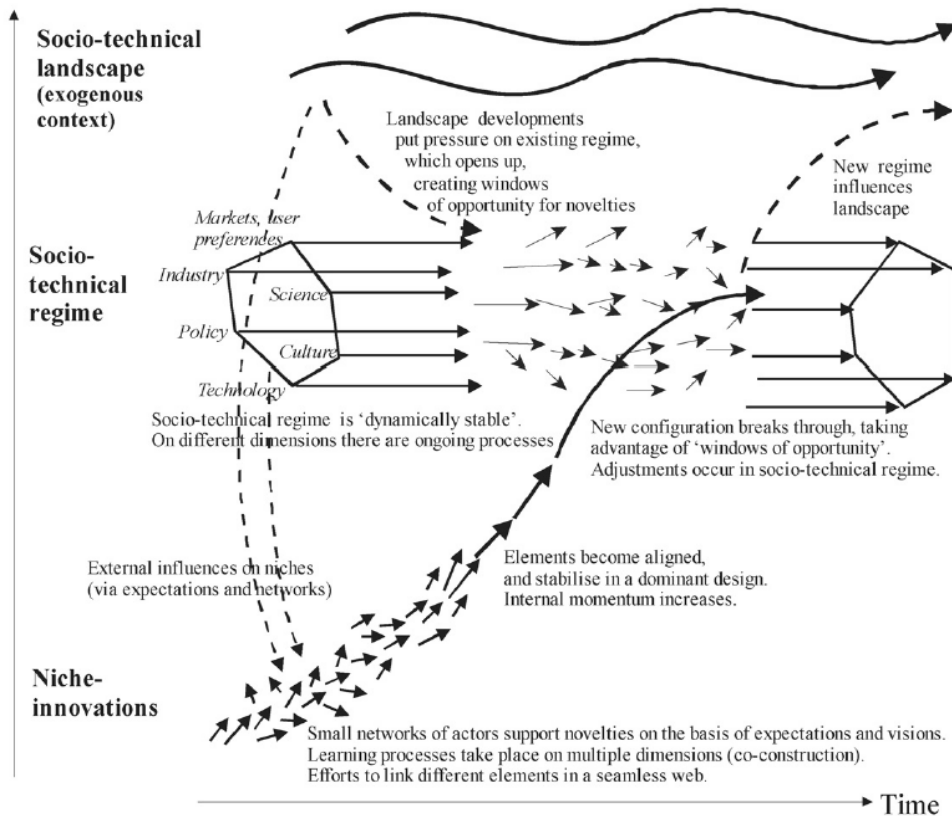
Figure 5.1: Dynamic system change over time from Multi-Level Perspective (Source: Geels & Schot, 2007).

The MLP framework emphasises how experimentation and innovation coalesce at a micro-level into wider movements capable of shifting entrenched regimes at meso- and macro- levels. At the same time it considers how changes taking place within the macro landscape in which a particular regime exists, may create 'cracks' or 'windows of opportunity' which favour (or repel) the ability of a particular niche to shift the current regime. More recent applications of the MLP have extended to include regimes' resistance to change. Geels (2014) cites resistance by the current non-renewable energy regime to new renewable technologies as an example. Geels stresses the need to consider active approaches for regime destabilization when attempting to mainstream green technologies. From the MLP perspective, a systemic transition is considered to have occurred when a particular constellation of niche practices or technologies are fully embedded into society (Genus & Coles, 2008). Van der Bosch and Rotmans (2008) identify three central mechanisms by which this takes place: deepening (learning as much as possible in a specific context), broadening (linking and repeating in different contexts) and scaling up (embedding the experiment in dominant ways of thinking, doing and organising). For the purpose of this paper, the term 'transformation' is applied to describe the process of change that individual elements within the system undergo along these three dimensions in order to

bring about a systemic transition.

5.2.1 CONCEPTUALISING COMPETENCY-INTENSIVE TRANSITIONS

While the MLP highlights that most systemic transitions are likely to rely on a similar mix of ingredients to be successful (technology, institutions, policy, skills, etc.) the weighting of these ingredients may, at times, vary to such a degree as to make them almost incomparable.

Consider shifting the transport regime of a city of 1million people from private to public transport. Considerable infrastructural and habitual changes are required for the transition to take place, but relatively few new competencies are needed. The knowledge on how to build a train system exists and although a few train drivers and other system operators may need to be trained up, almost every one of the million inhabitants will know how to catch a train (or could learn within a day). It is safe to say no new colleges of train travel would need to be opened.

Now let us imagine the agricultural system which surrounds that city consisting of an equal number of farmers. And, let us suppose a desire existed to shift this from intensive chemical production to organic farming. Some small infrastructural investments may be necessary in terms of returning organic matter from the city to the farms, and some habitual shifts may be needed in terms of the seasonality of what people cook with. However, the new competencies required to successfully farm organically are considerable at an individual level, and would need to be acquired by each and every farmer in the system. This would demand years of study and practice from each and every one of the 1 million farmers. It is a competency-intensive transition in that is disproportionally reliant on large numbers of people acquiring complex sets of skills and competencies they do not currently possess.

Unlike the transportation transition, many new centers of learning would be needed and ways of supporting the long-term competency development of each and every one of the million farmers would need to be developed. In a perfect world, budgets would exist to build these centers, competent trainers with the relevant skills would be on hand *en mass* to staff them and farmers would be able to put their businesses on hold while they re-skilled. On return to their farms, tens of thousands of extension workers would be on hand to support the farmers as they worked through the teething problems of applying their new knowledge in practice.

In reality this is not the case. Despite an ever-increasing awareness of the need for transformation within the agricultural sector in much of Africa (NEPAD 2013; NPC 2012; FAO 2017; SDGC/A 2017), training budgets are shrinking (Minde *et al.* 2012*;* Gómez *et al.* 2016; FAO 2017), extension services are plagued with staffing problems (Aliber & Hall 2012; Minde *et al.* 2012*;* Mohamedbhai 2014; FAO 2017), and farmers are often stretched to the limits battling to make ends meet. The skills to adequately train and support farmers within the *current* agricultural dispensation are in woefully short supply, not to mention the kinds of training and support capacities needed to underpin a mass up-skilling implied by a sustainability transition.

5.2.2 THE NEED FOR NEW METHODS

Under the current tertiary education system, the funds, institutions and teaching capacity are battling to reach more than 10% of Africans as they enter their working lives (Spaul 2013, Minde *e. al.* 2015,

Darvas 2017). At the same time, much is said about the potential for Africa to overcome many of its developmental challenges by leap-frogging (Maumbe & Okello 2013; Juma 2015; Njoh 2017). The region's uptake of cellular phone technology and mobile banking technologies are frequently-cited examples (Kikulwe *et al. 2014;* Onsongo & Schot 2017). However, given the current status of educational institutions on the continent, there is a particularly acute need to differentiate between transitions that are heavily reliant on the widespread development of new competencies and those that are not.

How does an awareness of the competency-intensive nature of a given transition better equip us to achieve it? We argue that a realistic appreciation for extent to which a particular transition is or is not reliant on extensive competency development, increases our chances of success.

In thinking about systemic transitions, Carlsson and Stankiewicz highlight the need to consider the centrality of competency flows and the institutions that enable them:

'Technological systems are defined in terms of knowledge or competence flows rather than flows of ordinary goods and services. They consist of dynamic knowledge and competence networks. [N]etworks of agents interacting in a specific technology area under a particular institutional infrastructure to generate, diffuse and utilize technology.' (Carlsson & Stankiewicz 1991, p.111).

Similarly, in their seminal book relating specifically to food system transformation, Goodman *et. al.* (2012, P.248) highlight the fact that 'network processes of knowledge transmission are the catalyst for expansion by horizontal replication'. Horizontal (or peer-o peer) knowledge networks are the means through which pioneer projects multiply their effect.

Viewing systemic transitions from this perspective 'highlights more explicitly the importance not only of understanding the creation of technology, but also its *diffusion and utilization*' (Geels 2004. 898. Own emphasis). This emphasis on the networked nature of competence is shared by a range of pedagogical theorists (Hakkarainen *et al.* 2004; Lorentzen 2008; Moore & Westley 2011; Hakkarainen *et al.* 2013; Torre *et al.* 2016).

5.2.3 CONSIDERING WHERE TRANSFORMATIVE KNOWLEDGE RESIDES

Taking this a level deeper, theory from the field of Transitions Management suggests that transitions within complex systems require a mix of three distinct types of knowledge: systems, target and transformative knowledge (Pohl & Hadorn 2007; Rauschmayer; Bauler & Schäpke 2015). Pohl and Hadorn describe these in Table 5.1 below.

Table 1: Three forms of knowledge (Source: Pohl & Hadorn 2007)

Form of knowledge	Research questions
Systems knowledge	Questions about the genesis and possible further development of a problem, and about interpretations of the problem in the life-world
Target knowledge	Questions related to determining and explaining the need for change, desired goals and better practices
Transformation knowledge	Questions about technical, social, legal, cultural and other possible means of acting that aim to transform existing practices and introduce desired ones

Formal research institutions tend to do better at developing Systems and Target knowledge than Transformative knowledge. That is to say, as sustainability scholars and educators, we tend to have a better idea of what the current issues are and where we would like to be than we have of how to get there – uncertainty is inherent in the complex challenges and transformations targeted here. The path is not clear yet, it needs to be created as the system's actors experiment with new behaviors. This suggests that in our attempts to identify and access transformative knowledge for teaching purposes, we need to be looking beyond the formal channels of institutionalised innovation – particularly in economies where public research institutions are under-resourced.

While the MLP does not explicitly differentiate between these three types of knowledge, it does emphasise that experimentation and learning coalesce at a micro-level - illustrating how, over time, this local level learning becomes increasingly influential as different elements within the emerging niche connect, align and stabilise (Geels & Schot 2007). This implies that the generation of new competencies for transformation (transformative knowledge) is a bottom-up process, which occurs at the fringes of the established system, outside of the dominant institutional cannon.

Unfortunately, however, the existence of a localised network does not ensure that the impact of the transformative knowledge it bears will successfully cross the scales and boundaries required to effectively support a systemic transition (Carlsson & Stankiewicz 1991; Moore & Westley 2011). The power of the learning that has taken place within the network needs to be purposefully wielded to ensure the niche does not remain trapped at the fringe of its system. One challenge here is that naturally developing networks have a tendency toward homophily, the connection of similar and like-minded actors. Spreading of innovation beyond the initial network often requires boundary spanners who are different from the network mainstream and have connections beyond the core of the initial network. It is often not the farmers themselves, but an external actor (e.g. extension agent, trainer, input trader, researcher) who will spread new knowledge beyond the niche (Klerkx *et. al 2009;* Kilelu *et. al.* 2011).

Furthermore, the development and transfer of competency within the niche network appears to be impeded by limited time and networking capacity among niche actors (Spielman *et. al.* 2008*, Moore et al.* 2015*)*, insular organisational cultures (Spielman *et. al.* 2008), self-referencing network connections (Lorentzen 2008), funding limitations (Minde et al. 2012), the fragmented nature of niche knowledge (Metelerkamp *et al.* in prep.) and problems developing trust (Spielman 2009). These pressures in turn limit a/the niche's ability to carry hard-won lessons forward into regime level

transitions (Moore *et al.* 2014*).*

In the context of Sub-Saharan agriculture (the focus of this study), one of the main hurdles that diminishes small farmers' innovative capacity is their inability to integrate into beneficial networks due to human and social resource limitations (Spielman *et. al.* 2009).

5.3 RESEARCH OBJECTIVE

Within the context of knowledge-intensive transitions, there is a need to better understand how the experiential and often fragmented knowledge of niche pioneers can be more effectively brought to bear in accelerating wider systemic change - specifically through learning.

This paper explores Net-Map's potential utility as a supportive tool in the promotion of learning for sustainability transitions. In doing so, the paper builds on research by Metelerkamp *et al.* (in prep) in which Net-Map was used to understand the learning networks of grass-roots sustainability pioneers. While the work explicitly targets agricultural training institutions operating at a grass-roots level in Southern Africa, there are implicit links to larger formal training establishments, extension services and educational investors.

5.4 DESIGN AND METHODOLOGY

5.4.1 OVERVIEW OF NET-MAP PROCESS

We applied Net-Map to an emerging sustainability niche within the food system in order to understand the learning networks of successful system pioneers.

Net-Map was originally developed to better understand multi-stakeholder systems by gathering in-depth information about resource networks, goals of actors, and their power to influence system outcomes (Schiffer & Hauck 2010). Net-Map merges two existing methods, namely social network analysis and power-mapping. As a research method, it is well-suited to the collection of qualitative and quantitative information in a structured and comparable way (Schiffer & Waale 2008).

Net-Map enables participants within a particular system to surface and explain the diverse and often obscure spectrum of actors who exert influence over the outcome of a particular objective or process within that system. The resultant network maps indicate who the relevant actors are, the ways in which they are connected to one another and their perceived power within the system (Schiffer & Waale 2008. p1).

Step 1. Prompting Question
A clear prompting question is required to demarcate the boundaries of the Net-Mapping process for participants.

In considering the prompting, question the research focussed on the full spectrum of actors influencing the success of farmers rather than asking a direct question about who their knowledge resources were. This was done for two reasons: Firstly, we wanted to construct a holistic picture of the full range of actors at play in their lives because, from a capacity-building perspective, these would be instructive of the kinds of actors that would need some form of coverage in a training offering targeting this career path. Secondly, approaching the topic of learning directly could, to some extent, bias responses and result in the exclusion of valuable insights due to differences in respondents' understandings about what constituted a useful knowledge resource. Also, as mentioned above, learning is only one aspect of successful transition, so by having a broader question, the mapping was able to illustrate how the learning is embedded in a network of other interacting connections.

The prompting question posed to interviewees was:
"Who are the actors that influence the success of an organic farmer in South Africa and how[/to whom] are they accountable?"

This was posed to key informants on an individual basis. The facilitator would write this prompting question up as a heading of the large sheet of paper used in the mapping process to ensure participants remained aware of the guiding question at all times.

Step 2. Listing actors
Working together on a large sheet of paper, the interviewer assisted the interviewee to list all of the actors whom the interviewee felt influenced the success of an organic farmer. At the discretion of the respondent, each actor was classified into one of five categories: Farmer, Community, Civil Society, State and Private Sector.
Examples: Civil Society actors listed included non-governmental organisations supporting farmers with training and other support services. State actors reflected the different spheres of government at local/ district, provincial and national levels, and a cross section of different state sectors from (primarily) agriculture to rural development, water and sanitation. Private sector actors tended to include local input suppliers, ethical retailers and privatised information resources. Community actors included spouses, consumers, international online forums and local families. Importantly, respondents were not unified in their classifications of actors. For example, Farmer 5 listed '[the] internet & YouTube' as a farmer-based actor because they were using it to access others farmers' knowledge. Whereas Farmer 3 listed it as a community-based actor because of the general spirit in which it was created and shared. To ensure simple category differentiation in the final map, different coloured sticky notes were used.

Step 3. Network mapping
The interviewer then guided the interviewee to establish the nature of the linkages between each of the identified actors based on a set of five pre-determined types; information, finances, resources, advocacy and authority. Each of the five types was listed using a

different colour. Respondents denoted the direction of the relationship as to/from/bidirectional.

Step 4. Allocating influence

Once the actors and their links with other actors were established, the influence of these actors was determined using checkers pieces to construct *influence towers*. This allowed the abstract concept of power and influence to be tangibly represented in a three-dimensional form. A limited number of checkers pieces were provided so interviewees had to carefully consider who the most influential actors were.

Step 5. Reflection and discussion

Net-Maps serve as useful boundary objects for anchoring complex discussions (Hauck *et al.* 2015; Stein & Barron 2017) and the process naturally tended to evoke substantial reflection and explanatory discussion from the participants. Allowing participants to embark on tangents and enter into storytelling mode as they were developing their networks appeared to increase the amount of actors and connections they listed. At the end of the process, as time allowed, participants would be invited to step back from their network maps and reflect on what they had laid out and make any amendments they felt were necessary.
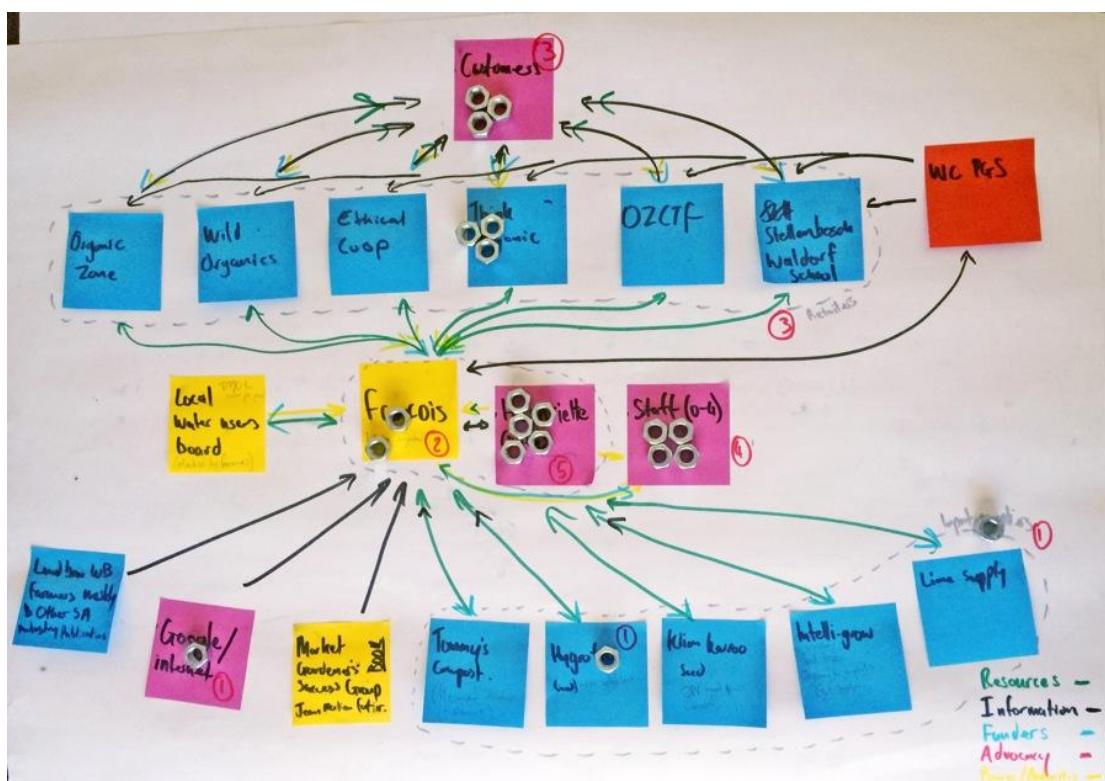

Figure 5.2. Example of the completed farmer Net-Map.

Sample

The Net-Map method was applied by individually interviewing a sample of organic farmers and related sector organisations.

A snowballing sampling process was used to develop a shortlist of 50 organic farmers in the Western Cape province of South Africa. These farmers were considered successful by their peers and related sector organisations. Each of these 50 actors were then rated against a common set of criteria to produce a short-list of five farmers, each representing a different scale of operation (see Table 1.) The Net-Mapping process was conducted on-farm and lasted between one-and-a-half and three hours per farmer, followed by a farm tour and broader discussion on each farm.

Table 5.1 List of farmer respondents

Farm Type	Years in operation	Farm size
Urban Community School Garden	1	0.1 ha
Peri-urban micro vegetable farm	2	0.5 ha
Rural vegetable farm	10	1.5 ha
Peri-urban vegetable farm	14	10 ha
Urban vegetable farm	11	24 ha

A similar process was followed for sector organisations, of which seven were selected (see table 5.2). Each represented different sector elements and were interviewed for between two and three-and-half hours.

Table 5.2 List of Sector Organisation Respondents

Organisation Type	Respondent years' experience
Retail Cooperative	7
Sector Activist	7
Sector Representational Body & Trainer	44
Local Fresh Produce Market	25
Rural development and Organic PGS	10
Provincial Dept. Agriculture	9
Farmer Advocacy and Training	40

The twelve Net-Maps were subsequently presented to an expert panel of 25 regional and

international sector representatives and farmers. Through facilitated small-group engagement with the Net-Maps, this panel provided reflection on the 12 Net-Maps. Their inputs informed the over-arching analysis of the Net-Maps.

5.5 RESULTS

The maps varied greatly in nature. In total the respondents listed 380 actors and 880 relationships. On average, farmers listed 17 actors in their Net-Maps, while sector organisations listed 43. The level of connectivity and complexity depicted in individual Net-Maps also varied greatly. On the whole, farmers tended to list individuals and identify the factors influencing their success in simpler, more direct terms than sector organisations. Sector organisations for their part considered much wider sets of relationships, extending to as many as seven intermediary actors separating farmers from those seen to be influencing their success. Differences such as this highlight that the process is not so much about mapping reality, but rather mapping network perceptions which provide the basis for behaviors and decision-making – the difference in perspective can be helpful for understanding why the other actor acts as they do.

Prevalence and influence were considered in the analysis. Prevalence refers to the frequency with which an actor or category of actors appeared. Influence refers to the weighting that the interviewees allocated a particular actor or grouping of actors.

General actors and influencers

The most influential actors in the eyes of farmers were members of their community (36%) and the private sector (24%). The least influential were civil society (16%), state actors (11%) and other farmers (11%). These two groups of actors along with other farmers were also the most commonly listed; private sector (42%), community (19%) other farmers (19%). The state and civil society were listed least frequently at 12% and 9% respectively.

The most influential actors in the eyes of sector organisations were civil society (27%) and the private sector (23%). These were also the most commonly listed at 28% and 24% respectively. The least influential were other farmers (12%) and community actors (11%). Community and other farmers were also listed least frequently at 13% and 10% respectively.

Focus on learning networks

The Net-Maps indicate to whom farmers turn for knowledge, as well as those to whom they do not. They provide an initial indication as to whether there are particular concentrations of knowledge and experience in the system and which specific individuals or institutions appear to be making substantial contributions to the learning taking place within the niche. Of the 380 listed actors, approximately 30% (124) were identified by interviewees as having knowledge or information flowing to organic farmers. Figures 2 and 3 provide a distillation of the farmer and sector organisation Net-Map data filtered for information exchange and coloured by classification. Table 5.3 provides the related numeric breakdown.
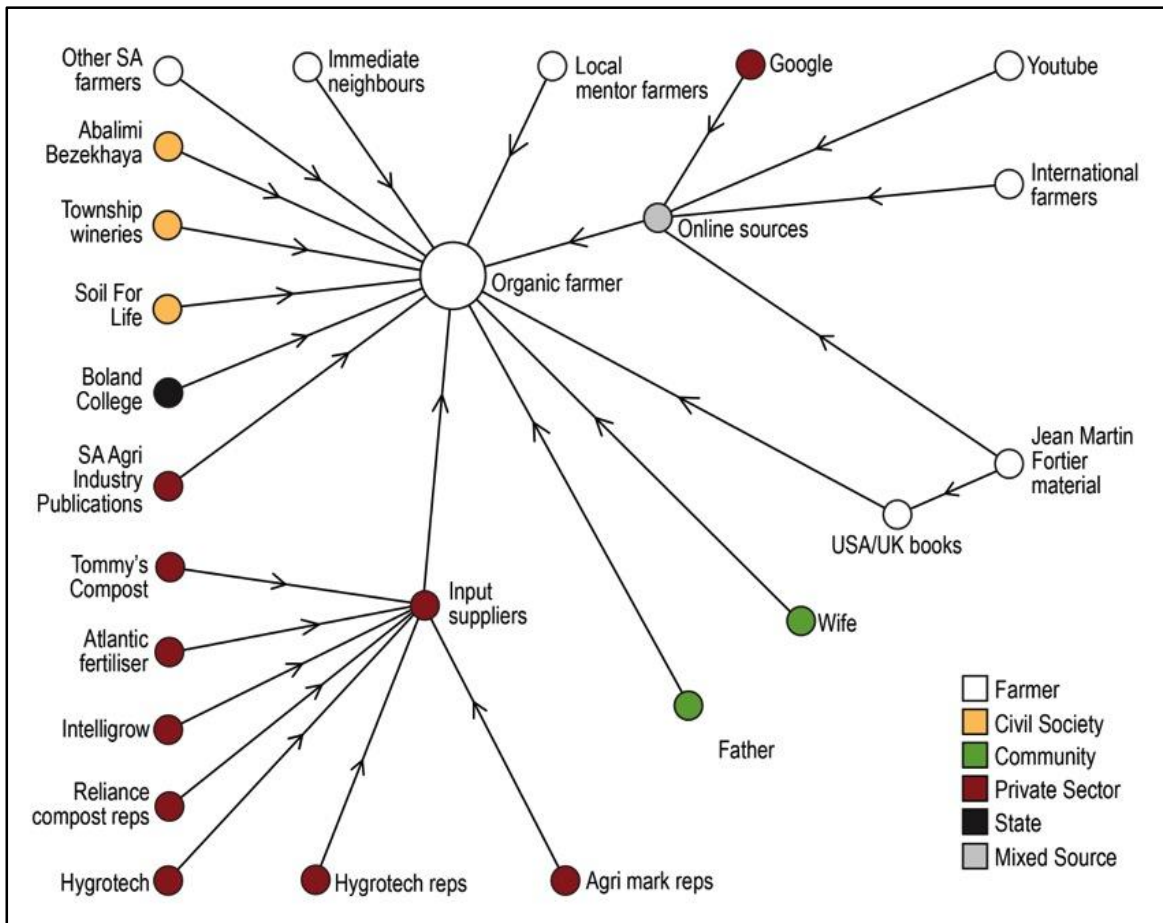
Figure 5.3: Combined network map of all actors identified by farmers as sources of information that influenced their success
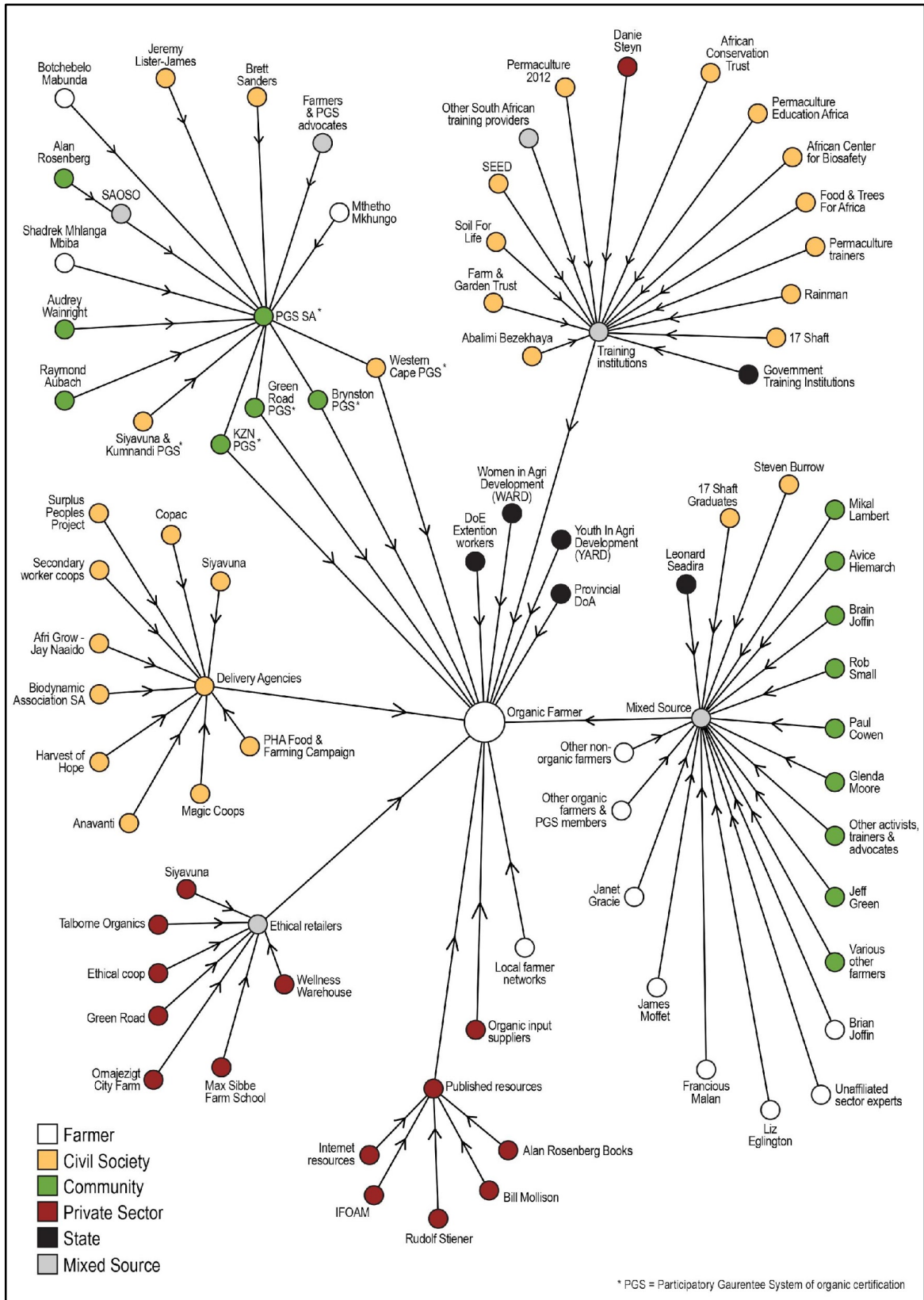
Figure 5.4: Combined network map of actors identified by sector organisations as influential information partners to farmers

Table 5.3: Information sources as listed by farmers and sector organisations

Farmer knowledge resources	Percentage of total actors	Number	Example
Private Sector	42%	10	Hygrotech[13] sales representatives, Reliance Compost sales representatives
Farmer	29%	7	Immediate neighbours, Other SA Farmers, Market Gardeners Success Group, Google, YouTube[14]
Civil Society	13%	3	Abalimi, Soil for Life
Community	13%	3	Google, YouTube, Wife
State	4%	1	Boland College
Sector Organisation knowledge resources	Percentage of total actors	Number	Example
Civil Society	44%	43	Western Cape Participatory Guarantee System, Abalimi Bezikhaya
Private Sector	18%	18	Ethical Co-op, Internet, Input Suppliers
Community	17%	17	Sector activists
Farmer	13%	13	Local farmer networks
State	7%	7	Dept. Of Agriculture, individual departmental advocates

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[13] Hygrotech is a local supplier of seedlings, irrigation systems and agricultural inputs. The company approach is sensitive to ecologically friendly agriculture.

[14] While Google and YouTube were not knowledge actors in their own right, they featured repeatedly as the primary portals for the online problem solving

Comparing these 124 relationships, the following observations can be made:

Firstly, universities and other accredited training institutions are conspicuous in their absence from the knowledge networks of both farmers and sector organisations. Farmers and sector organisations only made one reference to an accredited training institution in the direct knowledge/learning networks of organic farmers. Of these, only one was attributed any influence by a representative of a sector organisation. Universities featured in three of the sector representatives' maps, but not as knowledge partners to organic farmers. Instead, universities were seen to play an advocacy role for the organic sector - although this was attributed low influence overall.

Secondly, although sector organisations recognised the private sector as an important actor overall, they did not recognise its role in the knowledge and learning networks of the farmers; only one representative of a sector organisation made reference to the private sector in their knowledge network. Although representatives of sector organisations recognise the private sector, it seems they may underestimate the role which the private sector input suppliers play. Similarly sector organisations may overestimate the role that civil society plays in farmer learning.

International resources and digital learning channels featured repeatedly in farmers' view on where they sourced knowledge. Sector organisations made some reference to these and allocated no significant influence to them.

State actors seemed to have the weakest role in farmer training and knowledge networks. Where state actors like extension officers were listed, there was some sentiment that while they had an influence, this influence was not necessarily positive due to the fact that they were not trained to support organic agriculture.

5.6 DISCUSSION

Considering the implications of Net-Map as a supportive tool within sustainability transitions suggests that the method could serve as a useful tool to support curriculum designers, facilitators and students. The discussion to follow is presented in two sections: strengths of the method, followed by its weaknesses. Based on this, a revised version of the standard Net-Map method is provided aimed specifically for use in the educational context.

5.6.1 STRENGTHS OF THE METHOD

Surfacing system structure and relationships

Firstly, Net-Map proved to be a simple and relatively rapid means through which a training organisation seeking to engage the knowledge embedded within an emerging niche could surface critical relationships relating to the particular competency or career trajectory they are seeking to support.

This not only provided a useful lay of the land in terms of how a wider community of actors influences success within a given discipline, it also helps to protect against the potential blind-spots within existing curricula. In our case study, for example, sector organisations appeared to be overlooking the important role that supportive partnerships at home, online learning and the specific private sector actors played in the success of pioneering farmers.

Identifying keystone knowledge brokers

Having established a basic model of the relationships that were important to success for organic farmers, the Net-Map process provided a simple means by which to identify regional actors who are particularly central to what Carlsson and Stankiewicz (1991) refer to as the diffusion and flow of knowledge across the network. These keystone knowledge actors appear to play a pollinator role, joining the dots in connecting new solutions to common problems. By their nature they tend to be connected to far more nodes in the system than the average actor, and they tend to feature consistently in different kinds of actors Net-Maps. Ethical Co-op, for example, appeared as a richly connected actor in 7 of the 12 Net-Maps suggesting that it held a central role within the network economy. From an educational perspective, understanding who these actors are is important as they may serve as enabling allies providing advice and access to network resources.

Identifying subject specialists

Following on from this, the utility of the method for curriculum designers, facilitators and students is its ability to assist in identifying content specialists in contexts where knowledge is both fragmented and poorly archived. The Net-Maps generated in the process provide a quick and easy reference point for facilitators and course coordinators seeking to bring in specialist guest presenters, plan field trips or organise internships. Table 5.4 provides an example of how data from the Net-Maps can be distilled down into a local competency catalogue. Central to the power of these kinds of competency catalogues is that they are practitioner peer-reviewed through the Net-Map process (we elaborate on this in the following section).

Table 5.4: Abbreviated example of local competency catalogue

Key Competencies	Competency specialists
Organic vegetable production	Francios Malan, Jacques Olivier, Skye Felman, Market Gardeners Success Group
Seed and seedling production	Hygrotec and Klien Karoo Seed
Compost production	Tommy's Compost, Reliance Compost,
Record keeping and accounting	Henriette Malan
Alternative retail systems	Ethical Coop/Anique van de Vlugt, Wild Organics, Audrey Wainright, Market Gardeners Success Group
Philosophy of agroecology	Alan Rosenberg, Raymond Aubach
Communal farming and urban food gardens	Soil For Life, Rob Small

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Using the different colour lines to indicate different forms of connection between actors also provides an easy way for educators and students to understand which kinds of actors hold knowledge on specific aspects of the system. While the influence weighting attributed to each actor in the individual Net-Maps can provide an indication of the potential importance of the knowledge particular actors have to offer.

Verifying practitioner knowledge in absence of formal qualifications

The case study suggested that very often those most qualified to teach within transitional spaces are practitioners and activists who possess a proven ability to function within the system but have no formal qualification relating to their expertise. This raises the need for ways of validating expertise and establishing who subject specialists are.

When attempting to support competency development within niche spaces, which by their nature attract radical thinkers, the challenges faced by students and facilitators in discerning fact from fiction should not be underestimated. The difficulties of working out how to discern between radical actors purveying passionate but unproven pseudo-science and unconventional approaches that actually work, should not be taken lightly. For training organisations, getting this wrong can set youth up for failure, ultimately doing more damage to youth and transition movements than not doing anything at all.

To overcome this, the Net-Map process provides a form of grass-roots peer review for knowledge sources within a given network. As they seek to overcome their day-to-day challenges, niche actors are continually trialling solutions. In doing so they are continually evaluating the ability of solutions proposed by others to hold up to the demands of their context. Over time, sources of information that yield results are retained and those that do not are discarded. Based on this, we assert that the level of influence attributed to a particular knowledge source and the number of niche actors who make reference to a given information source, can be used as a means of verifying the degree to which a particular knowledge source (or type of knowledge source) can be depended on in a given context.

As a supportive tool in the absence of formal articulation frameworks

While the validation of knowledge is important, this also needs to be pitched at the relevant level. The kind of information sources that yield value for an actor with 10 years' experience, may differ significantly from the needs of a young entrant taking their first tentative steps into a new career.

Progression through conventional education programmes is based on the premise of a learner articulation framework. This serves as a guideline for the level of competency a learner has achieved and what following courses of study their current level of competence equips them to progress onto. A Diploma in agriculture enables entry to an Advanced Diploma and so forth. For facilitators this provides guidance on what kinds of knowledge students require to achieve a certain kind of practical outcome. However, for those attempting to teach new subjects in informal contexts, outside of established articulation frameworks, making informed decisions around what to teach when and what to leave out can be difficult.

While it was not a direct aim of our study to test the application of Net-Map for this purpose, a reflection on our process suggests potential.

Our study covered a broad spectrum of farmers ranging from a fledgling 0.1ha community garden to a well-established 24ha commercial operation (see Table 5.1).

We noted that, as the nature of each operation changed, so too did the kind of knowledge and

supporting knowledge resources. While more data points for each scale of farming would clearly be necessary before conclusions could be drawn, an initial review of the Net-Maps of the five distinct farm types displayed substantial differences. For example, farmers in the earlier stages of their careers tended to turn more towards civil society organisations and more established farmers. In turn, these more established farmers appeared to have outgrown the available local resources and resorted increasingly to a smaller handful of international knowledge resources.

Assisting in understanding the learning resources students require

Once a list of key knowledge resources has been defined, an assessment can be made to determine the kinds of learning resources required in order to access these resources. The dual emergence of online learning resources paired with a contextually sensitive, place-based approach shifts the kind of planning required to link students with these resources.

Understanding the nature of knowledge resources operating within a given niche or career field allows facilitators to begin asking the relevant questions: if key online resources are available for free, then do students have access to smartphones or computers to access these? Do they need mobile phone data to be able to work from home, and so forth. For students for whom English is not thier home langauge, translation of material may be an additional consideration.

When it comes to human teaching resources, it may be helpful to consider which resources are most time stressed: differentiating between resources that should be visited as a group to avoid over burdening the teacher, and where might it make sense to encourage students to build independent relationships with a particular resource? And, in both cases, consider what institutional support is needed to support this network building.

 Building on this, Table 5.5 provides examples of case study specific insights for localised agroecological food systems. The research identified six particular groups of influential knowledge partnerships that could be of value to educators seeking to support aspirant farmers.

Table 5.5: Examples of case study specific learning insights from Net-Map process

Knowledge actor	Notes for educators
Online knowledge communities and resources	Wide range of free and high value learning material exists online. However, for those without extensive practical knowledge in the field, sifting through the plethora of international sources to determine the true utility of information and its local applicability can be a minefield. Probing successful farmers for the online resources they trust and use most frequently provides a reliable screening and validation approach. Once these online resources have been curated, sharing this information with other, less experienced or less online-savvy farmers could highly increase their effectiveness and efficiency of accessing useful information online
Alternative retail outlets and consumer cooperatives	These are keystone actors in the system that tend to be very well networked potentially making them critical knowledge brokers. Because they engage with quite a large number of farmers, they tend to have to most the accurate picture on who the most successful farmers are and where they are based. They are also well positioned to provide information on other markers of agricultural success, about which farmers supply most consistently and at what scales. Also, it is in retailers interest that more farmers manage to produce organic products reliably and efficiently, thus they would have a business interest in sharing information with the farmers.
Home relationships	Successful farmers didn't make it alone, most appeared to have succeeded as a close-knit husband/wife team. This suggests that farmers should not be trained in isolation. Thought should be given to jointly capacitating husbands/wives/families in other aspects of farm business. This appeared to be a major blind spot among supporting organisations.

Private sector input suppliers	Expecting farmers to be achieving the idealistic goal of total farm sufficiency in terms of generating on farm inputs such as seedlings and compost is setting them up for failure. Relationships with good compost and seedling suppliers came out as particularly important to success not just because of the critical materials they supplied, but also because they unlock access to important specialist information. Private sector input suppliers like these play an important role in the niche and should not be underestimated. As with retailers, input suppliers share a vested interest in farmer success. Unlike agricultural extension agents, farmers beyond the subsistence level tend to see input providers and retailers on a regular basis, so both can be effective connectors to a large base of farmers.
Other successful farmers in local context	In the organic context, given how few farmers exist, care needs to be taken not to overwhelm those that offer help. Working to document and digitize this pioneer knowledge may be one way of greatly expanding access to valuable knowledge resources without over burdening practitioners with teaching requests. Involving farmers' spouses in training processes may also assist in exampling teaching capacity.
Civil society organisations	Play an important role in the learning landscape of some niche actors – particularly emerging farmers. This is probably particularly true in contexts of high inequality.

5.6.2 LIMITATIONS OF METHOD

Net-Map was not originally intended for use in an educational context. Despite this it proved well suited to supporting learning within niche environments. In order to refine its efficacy in these spaces we reflect on a number of potential limitations that were observed.

Blind spots & social bias

The method was good at identifying where exchanges of information were and were not taking place. However, in the case where no connection was present, this could have been for a number of reasons. This ranged from not having useful knowledge to contribute, to not having time to contribute knowledge or intentionally withholding information. Net-Map in its default format may at times struggle to differentiate between these unless a large sample of actors is taken from different corners of a network. In smaller sample sizes, this has the potential to create blind spots in the knowledge landscape where actors who are not richly connected are assumed not to have valuable knowledge.

Similarly, the weighting of particularly vocal and/or extrovert actors within a system may be skewed

because they enjoy social interaction and connectivity.

While the risk of blind spots is common to most methods, remaining cognoscente of the blind spots in this case can help guide Net-Map facilitators to use the qualitative discussion that happens during the mapping, to discuss the quality of the linkages and the reasons why links do or don't exist.

Overlaps between competence and incompetence

If network connectivity, frequency and influence are to be used as a frontline proxy for knowledge validation in the absence of scientific or curriculum review processes, care needs to be taken in determining which specific competencies the network is ascribing to a specific actor and which they are not. The process as it currently stands is not designed to do this and requires modification if it is to be applied in this context (see Revised Net-Map Approach in Annexure A).

Discussions with participants during the Net-Map process about the type of knowledge particular actors had which they deemed to be valuable became a critical component in the process. Without careful documentation of this qualitative, actor-specific information, there is a risk that competence in a specific area results in false assumptions of competence in other fields. The fact that an actor has become a knowledge resource through their mastery of one aspect of a system does not mean their knowledge around other aspects is deemed credible by the network.

We found that adding simple notes to the connection arrows enabled us to ensure this information was reflected in the final maps. Depending on the level of detail required, investigators may find it useful to include this step in this overall process as respondents ascribed the connections between the various actors.

Lacks some general educational elements

The basic Net-Map method which we applied to this process lacked some features that would have been useful to potential students and teachers alike. For example, while it indicated who the valuable knowledge resources were, it gave very little specific information of:

- The availability of these resources. How willing was a specific actor to share their knowledge and did they have time?
- Their level of teaching experience.
- Nature of potential teaching resource (eg. digital, institutional, individual)

However, we found a notable strength of the Net-Map method to be the ease with it can be adapted and customised. In our revised method presented in Annexure A, we provide simple 'fixes' to the aforementioned gaps.

Reliant on social capital

As the strength of the process rests on being able to get direct information from the most successful actors within a given system, the absence of sufficient social capital required to access these actors could make the Net-Map process difficult and time-consuming to execute effectively.

In our experience, the social capital of the NGO we represented, paired with existing relationships with certain actors, assisted substantially in enabling access to the full spectrum of actors we sought to interview. It also made the process of securing actor participation quick and easy despite the

substantial time pressure and research-fatigue faced by some actors within the system.

From a sampling perspective, the application of the method in the field was also made easier by our intermediate awareness of the system to which we applied the method. Awareness of keystone actors who can act as filters for the kinds of skill sets you are looking to profile was particularly useful. In our example, the alternative food retailers served this function. In cases where less is known about the system, a snowball approach to sampling can assist in overcoming this challenge.

5.6.3 CUSTOMISED NET-MAP APPROACH

In weighing up the strengths and limitations of Net-Map as a support tool in educational contexts, a noteworthy attribute of the method is the ease with which it can be adapted on the ground, to fit the needs of a specific context. Thus, while Net-Map in its current form yielded some useful insights, customisation of the method to improve its utility to educators is relatively simple. As alluded to earlier, gathering education-specific baseline information during the mapping process could make a big difference in the use of the Net-Maps to support learning processes.
 An indication into some important educational characteristics of the listed actors could include:

- The availability and/or interest of an actor to be involved in teaching
- The level of teaching experience
- Nature of the potential teaching resource (Digital/Institution/Individual)
- Specific area of competency

The main challenge in customisation is balancing the desire to add new layers of data collection with the need to retain the simplicity that made the method so effective. Therefore, in thinking about process customisation, as much thought needs to be given to which layers of data collection can be discarded, as to those which can be added.

For example, the original Net-Map approach suggests listing actor goals or objectives. However, in our experience, this added a layer of data which was not warranted in this context. The process moved more smoothly and freed up time for inclusion of more relevant data when this step was excluded. In this context, we suggest removing listing actor goals/objectives to make time for more education specific information.

Naturally, the larger the number of actors reflected in respondents networks, the more important this point of retaining simplicity becomes.

In Annexure A we propose a customised Net-Map process, *The Net-Map Learning Landscape*. This provides a foundational customisation for educators working with Net-Map as an exploratory planning tool for curriculum development for emerging career fields.

5.6.4 REFLECTION ON THE MULTI-LEVEL PERSPECTIVE HEURISTIC

In considering how these findings link back to the MLP heuristic around systemic transitions, we note that the MLP views learning taking place at a niche level as a prerequisite to the mainstreaming of emerging sustainability innovations. In the context of what we refer to as

knowledge-intensive transitions – such as in agriculture – the need to support the development and diffusion of new knowledge at a grassroots level is particularly great.

The Net-Maps from this research process validated the MLP heuristic in so far as they confirmed that the knowledge network of the case study niche existed almost entirely outside of the mainstream institutional cannon. The existing socio-technical regime (e.g. state departments, academic institutions and extension services) scarcely featured in the niche's knowledge economy.

Conversely, informal grass-roots networks were engaging in a range of pro-active learning processes on multiple fronts. These consisted predominantly of fringe actors although in some cases well-established private sector actors played an influential role.

From a methodological perspective, these findings highlight the need for new tools to support the weaving together of emerging skill-sets into bodies of knowledge capable of disrupting prevailing socio-technical regimes. Our findings suggest that Net-Map could be one such tool and that the method warrants further investigation in this regard.

5.6.5 *JOINING THE DOTS IN PRACTICE*

The effectiveness of niche networks depends on the collective capacity to facilitate exchanges of information and resources. In the terminology of network analysis, this capacity is known as the network's ''navigability'' (Nexus 2002; Spielman 2009). For those working in emerging knowledge environments, Net-Map, quite literally, provides a means to map out uncharted actor networks so that they can be effectively navigated.

For learning

Place-based education is an orientation that depends most of all on who the "educators" and "learners" are and how, where, and why they are coming together. Net-Mapping has the ability to support and structure this coming-together of actors within a local system around particular learning goals which they themselves define. In the context of emerging career fields, where pioneer knowledge is fragmented and poorly documented, Net-Map could prove useful as an entry point during the preparatory phase curriculum planning and design - particularly in assisting training designers, course conveners and facilitators to move beyond flawed assumptions and uncertainty in order to provide contextually informed insights into:

1. What should be taught?
2. Who/what are the most suitable actors and resources are for teaching this?
3. What kinds of networks of relationship matter most for the local working context students are entering?
4. Pathways for supporting students to cultivate these relational networks

In doing so, Net-Map enhances the navigability of locally grounded networks of practice by providing answers to some of these 'who', 'how' and 'where' questions.

Furthermore, we believe there to be a secondary opportunity for the use of Net-Map by students. Our experience, in South Africa, is that training institutions working to support bottom-up sustainability

innovation tend to be under-resourced and thinly spread on the ground. This means that students often travel long distances from their homes in order to attend relatively short training courses in larger towns or cities. On arrival, students may find that training institutions have neither the time nor the locally relevant knowledge to support each individual student to develop knowledge relevant to their home context. Furthermore, reliance on distant training centers also perpetuates disempowering social narratives among youth that the knowledge necessary for change will come from outside, rather than within.

In the hands of students such as these, Net-Map offers a way to ameliorate these challenges. Firstly, its simplicity means it could be taught to students over the course of a single day, empowering them with a simple means of structuring a continued learning process on return home. Secondly, it empowers and encourages students to focus on the existing local knowledge within their own communities.

For students it is a practical tool for answering questions like:

1. Are there existing informal networks within my context that can support my journey?
2. What kinds of things do I need to be learning about in order to succeed in my context?
3. Who/what are the best available resources I can draw on for this learning that have worked for others like me?
4. When faced with a particular kind of challenge, who can I turn to?

For investing

Beyond the immediate learning applications, Net-Map provides a sense-making framework for various types of funders and investors seeking to support the evolution of niche spaces. By identifying who the niche believes to be the most important and influential actors are, as well as illustrating the relationships between them, Net-Map provides a suite of useful information such as: which actors warrant investment and why, as well as what the knock-on effects of such investments might be for other actors in the network.

5.7 CONCLUSION

This paper presupposes that in order to accelerate sustainability transitions, broadly applicable, cost-effective tools for mainstreaming niche innovation are needed. It acknowledges that the practical challenges of achieving this at scale for knowledge-intensive transitions (such as agriculture) are daunting. Remembering that 90% of the 800 million youth predicted to enter the African job market by 2050 are predicted to have no form of tertiary training, we assert that in regions with weak educational infrastructure and rapidly growing youth populations, the need for new methods of knowledge dissemination is particularly great.

With regards to the need for new methods, our findings suggest that Net-Map could serve as one such method. Placed in the hands of educational practitioners in grass-roots civil society organisations and other training providers, Net-Map serves as a navigational aid in connecting learners to fragmented practitioner knowledge - particularly so in emerging career fields where formal curricula have not yet been developed. In the case study, Net-Map proved useful in identifying knowledge networks and

actors that influenced the successful establishment of new livelihoods. It also demonstrated that it could assist in validating informal learning resources.

These attributes make Net-Map a potentially low-cost method for circumventing traditionally costly approaches to curriculum development and accreditation – assisting community-based actors to make sense of the confusion surrounding emerging career fields. The method's ability to connect learners to communities of practice also implies alignment with the kinds of place-based pedagogies advocated for by educational theorists (Sobel 2004; Parr & Horn 2006; Spielman *et. al.* 2008; Wals *et al.* 2017) engaging with questions of socio-ecological sustainability.

While the method held promise in its existing form, we note that it was not originally designed specifically for use in the education sector. To improve the method's utility in educational settings, some basic adaptations were proposed under the banner of the *Net-Map Leaning Landscape*.

Importantly, the research did not go on to test the application of the method's traits empirically with students. Nor did it undertake a direct comparison with other approaches. As such, we suggest cautious experimentation with this tool in educational contexts in parallel with existing approaches. Empirical testing of the revised method is needed to begin developing a more comprehensive understanding of the potential efficacy of Net-Map in an educational setting. That said, the easy-to-use, open-source nature of the method suggests that it would be easy for grass-roots activists, educators and students to customise and deploy.

5.8 ANNEXURES

Annexure A:

Net-Map Learning Landscape

The Net-Map Learning Landscape method is divided into two phases: A primary network overview to which a secondary educational layer is then applied.

The first phase of the process seeks first to develop a holistic understanding the structure of the overall influence network determining the success of a specific individuals within a given career field - in our case the success of an organic farmer. This exercise extends beyond the way that the network learns, to include exchanges in funding, resources, political pressure, etc., because we for the success of organic farmers their learning network is one of a number of factors.

The second phase then seeks to understand the intrinsic nature of the influencing factors first. Then, secondly, to understand how this network of actors operates in a learning capacity. The learning orientation of the exercise is not stated up front. Stating the learning intention upfront is likely to bias the responses of the respondent and exclude a wide range of potentially critical learning resources which are not typically associated with educational outcomes in the respondents mind. Furthermore, it is important to remember that two levels of relevant data are being collected.

1. A compendium of important influencing factors within the system
2. A compendium of potential learning resources

These may or may not overlap in the same actor/resource. Therefore, only once a holistic picture has been mapped out by the interviewee should the interviewer then move on to overlay a learning focus over the network.

Preparation

1. Define parameters
   a. Define question – Who influences the success of [insert career role here] in [insert geographic boundary here]?
   b. Define links that are relevant – e.g. Resources, Advice, Information, Command, Funding
   c. Decide who should be interviewed [Typically this can target niche actors who have excelled in the relevant career field, as well as experienced niche actors closely connected to them]
   d. Define actor categories relevant to your field – e.g. Farmer, Civil Society, Private Sector, Public Sector, Community, Online Resource [This step can cause confusion and is not always helpful. It can be left out to streamline the process]

Network mapping

2. Actor selection

    a. Ask: "Who is involved in this process?"
    b. Write names on actor cards and distribute on empty Net-Map sheet

Market Women

Women's Groups

Ministry of Evironm.

Irrigation Farmers

District Assembly

NGO

Ministry of Agric

Fulani Herdsmen

Fishermen

Name: Moses Ayemba
Date: 12.07.2007
Study: Impact on local irrigation
Kinds of links:
Red: Money
Black: Command
Green: Advice
Blue: Information
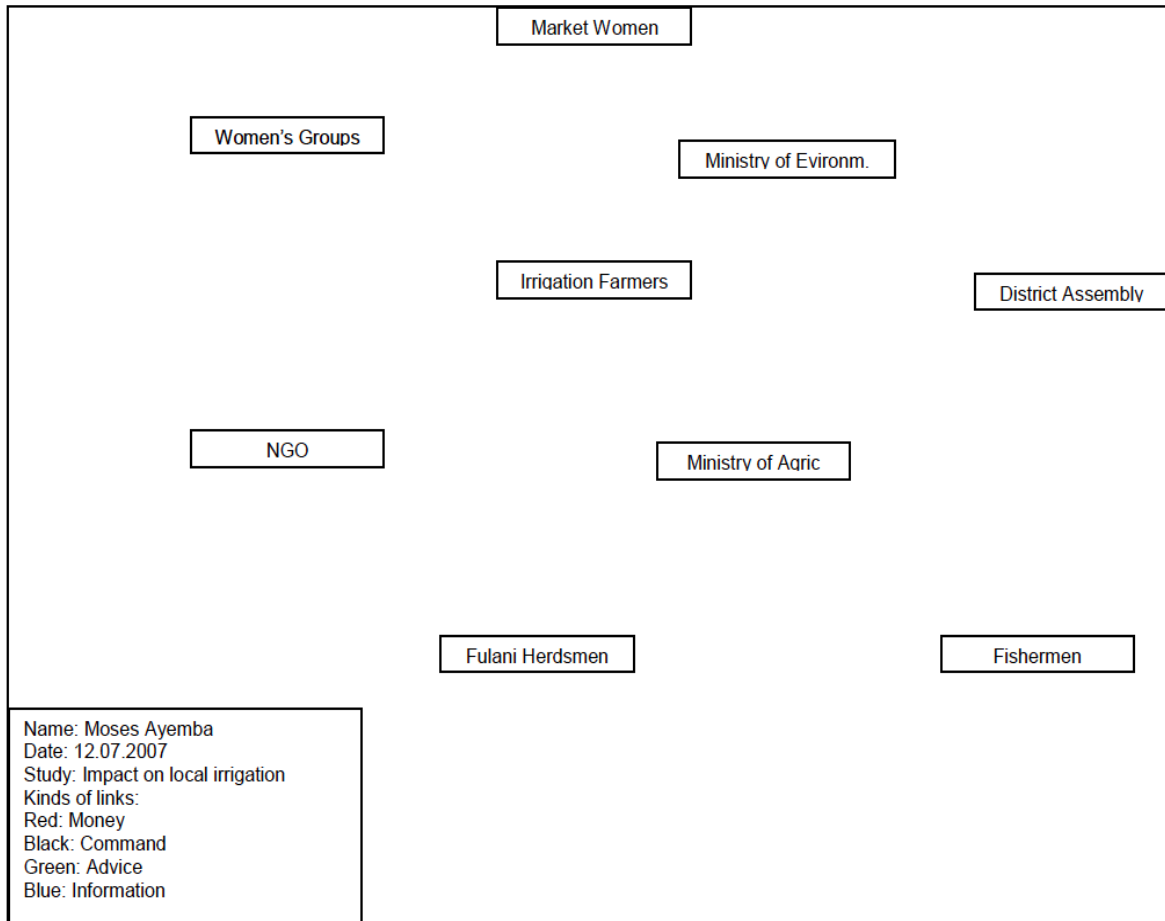
3. Drawing of links

    a. Ask: "Who is linked to whom?" Go through the links one by one (e.g. "Who gives money to whom? Who gives information to whom?")

    b. Draw arrows between actor cards according to interviewees directions.

    c. If two actors exchange something (e.g. information) draw double headed arrows. If actors exchange more than one thing, add differently colored arrow heads to existing links.
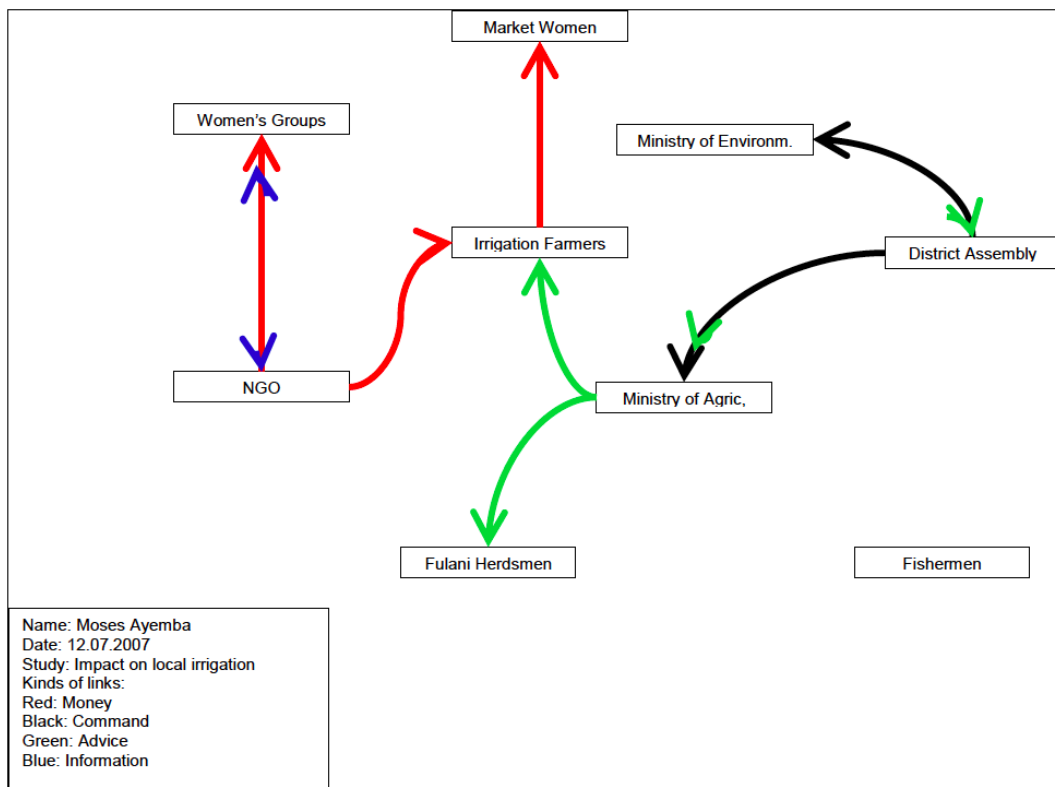
Note, that it is important in this step that interviewee and interviewer have the same understanding of what a link means. Sometimes it is helpful to ask for examples, e.g.: If there is a formal command line between A and B, what is their relationship like in practice, what does this mean?

4. Influence Towers

   a. Ask: "How strongly do actors influence [*for example*] *the success of an organic farmer in your region*?"
   b. Explain / agree on a definition of influence with your interviewee, clarify that this is about influence on [*for example*] *the success of an organic farmer in your region* and not influence in the world at large. Also, remind interviewee that this is not a question about how it should be but how it actually is.
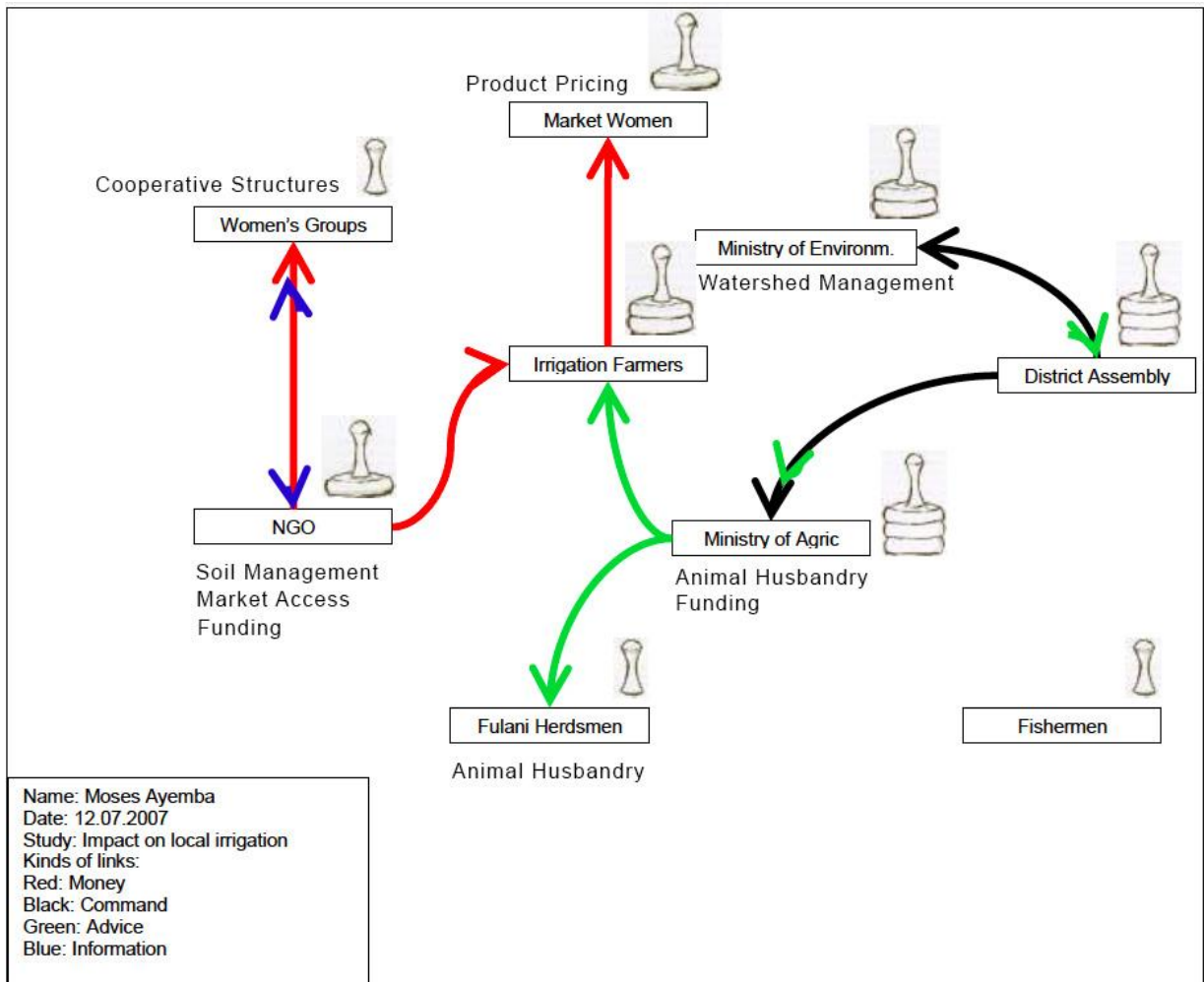   c. Ask interviewee to assign influence towers to actors using checkers pieces, bicycle ball bearings, Lego ™ blocks or other stackable pieces to build these towers: The higher the influence on the issue at stake, the higher the tower. Towers of different actors can be of the same height. Actors with no influence can be put on ground level. Towers can be as high as interviewees want.
       i. Place influence towers next to actor cards (see picture 3)
       ii. Verbalize set-up and give interviewee the chance to adjust towers before noting height of tower on the Net-Map (important for documentation purpose)

Name: Moses Ayemba
Date: 12.07.2007
Study: Impact on local irrigation
Kinds of links:
Red: Money
Black: Command
Green: Advice
Blue: Information

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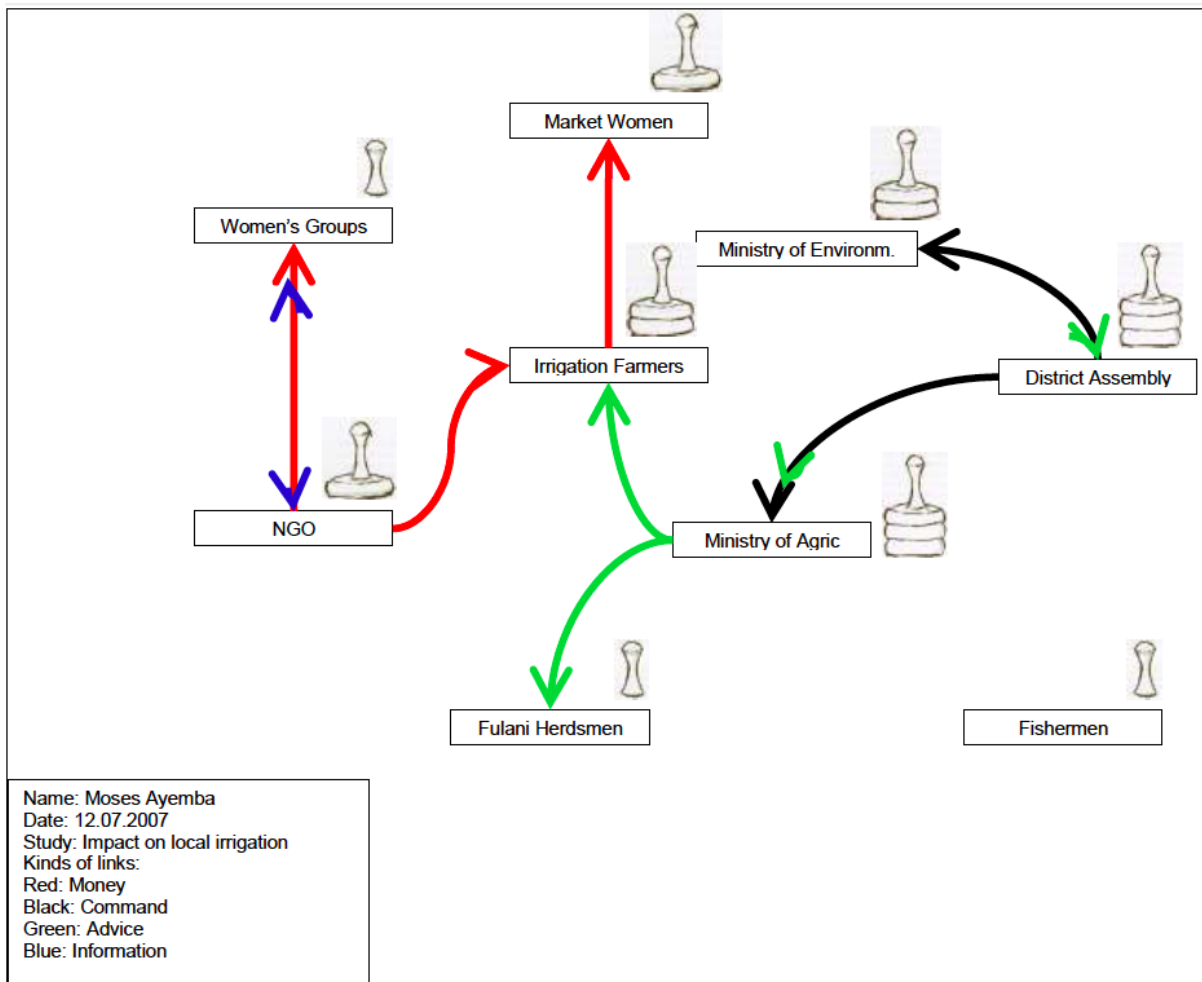
Learning landscape

5. Attribute competencies. Ask: 'What valuable competencies does this actor have?' Or, 'In what areas is this actor particularly proficient?'

Product Pricing

Market Women

Cooperative Structures

Women's Groups

Ministry of Environm.
Watershed Management

District Assembly

Irrigation Farmers

NGO

Soil Management
Market Access
Funding

Ministry of Agric
Animal Husbandry
Funding

Fulani Herdsmen
Animal Husbandry

Fishermen

Name: Moses Ayemba
Date: 12.07.2007
Study: Impact on local irrigation
Kinds of links:
Red: Money
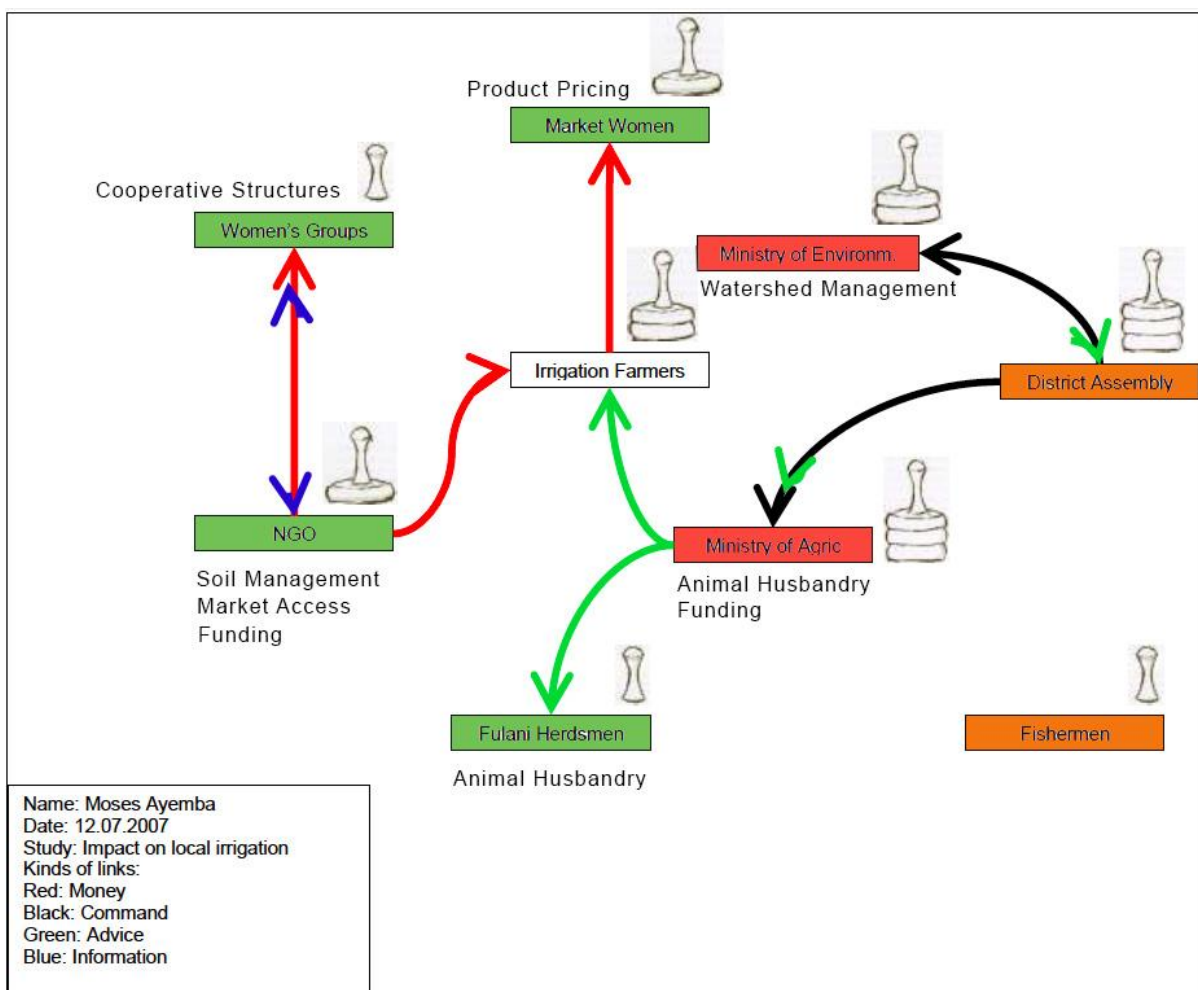Black: Command
Green: Advice
Blue: Information

6. Rate resource availability. On a scale of 1-3 how accessible is this resource to students? This can be colour coded.

Green: Willing and able to teach/share/help – good resource
Orange: Willing but time stressed – proceed with care
Red: Unlikely to be able to assist – last resort

7. Identify star teachers: Provide 5 gold stars to interviewees. Ask them to imagine themselves as a student [you may want to specify the students level] and then use the stars to indicate which actors/resources have most to offer. Tell them they can allocate more than one star to a single actor.

Remind them that a book, or an experience of place (seeing something revolutionary with their own eyes) can be as effective as a person conveying information.
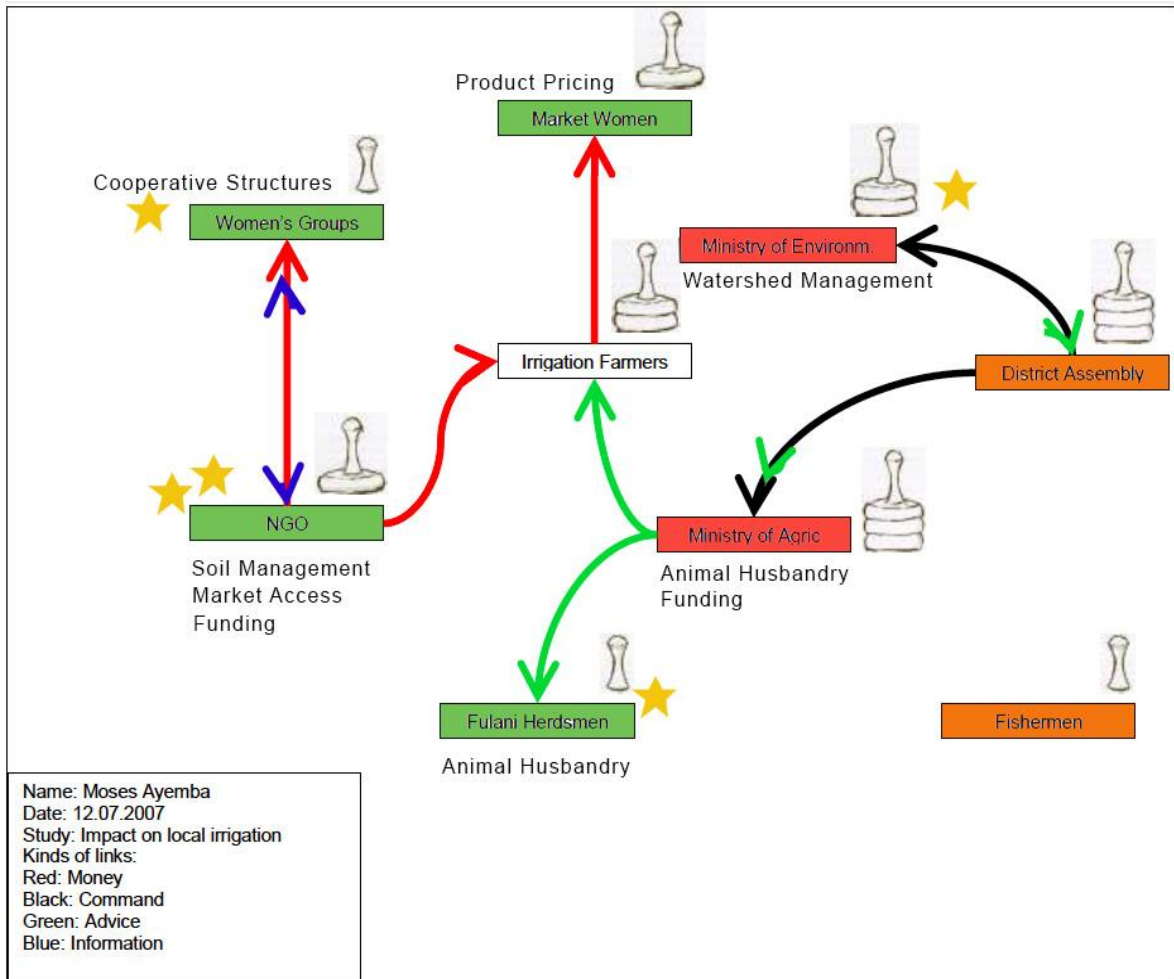
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6. CONCLUSION

This research is set against the backdrop of a growing youth crisis and a broken food system that exacts an untenable toll on the environment while increasingly marginalising people - particularly black youth and the poor.

Thus the overarching aims of this study were to enhance the understanding of youth perspectives on agricultural careers specifically in South Africa as well as to better understand how and where transformative food system knowledge is developing.

In light of the paradoxical turn away from land based livelihoods in the face of exceptionally high levels of youth unemployment in South Africa, this thesis argues a seemingly obvious but often overlooked point: Support to youth in agriculture should be responsive to the perspectives and aspirations of young people. This means stepping back from a narrow focus on how to integrate young people into the existing system, and asking instead, what it is about agriculture that resonates with youth and what kind of food system they envision for their futures?

What emerged from Chapter 3 was a strong set of negative social stigmas relating to agricultural careers. However, in juxtaposition to this many youth held a deep passion towards working sustainably on the land, a desire to be entrepreneurial and placed value on work that made a social contribution to their community and country. It was recognised that the prevailing corporate food regime was becoming increasingly unequal and did not resonate with the aspirations of the majority of young South Africans. Furthermore, Chapter 2 suggested that the agricultural sector under the corporate food regime is shedding jobs and is unlikely to be able to make a meaningful contribution to addressing youth unemployment without significant structural reforms. This fact was mirrored in both the literature and strategic policy documents such as the National Development Plan.

With this in mind, Chapters 4 and 5 set out to investigate alternative spaces in the food system. Niche environments, in particular, where things worked in ways that aligned with youth aspirations, as well as providing an ecologically sustainable model for what employment intensive food system reforms could look like. A broad survey of various transitions literatures indicated that understanding and supporting niche innovation and growth through collective learning is vital to leveraging niche's role in wider systemic transitions. Therefore, to avoid becoming too broad in scope, the research focussed specifically on the transformative competencies. Interestingly, formal training institutions and state-led extension services were completely absent from the niche knowledge economy. However, in their place dynamic, informal and often digital learning networks had risen to fill the gap. Despite their many challenges and limitations, these loose learning networks appeared to operate at a very low cost despite displaying a high degree of pedagogic sophistication.

Thus, my unique contribution to this broader debate around youth and food system transformation has been to twofold. Firstly to explicitly recognise, seek, obtain and understand youth's perspectives on agricultural careers so as to better inform work intended to engage them in such careers. And, secondly, to better understand how the experiential and often

fragmented knowledge within niche spaces can be more effectively brought to bear in accelerating wider systemic change - specifically through youth competency development.

Contributing to this, the four main objectives of the study have been to:

1. Provide empirical data regarding youth attitudes towards agricultural careers in South Africa (Chapter 3).

2. Create space for youth perspectives to inform visions for what agricultural futures should look like (Chapter 3).

3. Contribute toward an improved understanding about where the knowledge for transformative change within the food system will come from (Chapters 4 and 5).

4. Contribute towards the development of practical approaches for connecting youth to this knowledge (Chapters 4 and 5).

The subsections of Chapter 6 draw together the novel contributions of the three research papers as well as the literature discussion. These will be presented under four subheadings, as follows:

o   Key overall findings
o   Summary of three papers
o   Synthesis of Novel Contributions
    -   Theoretical Contributions
    -   Empirical Contributions
    -   Methodological Contributions
o   Implications for Decision Makers

Following these, a retrospective reflection on the limitations of the overall study is presented. It concludes with recommendations for future research.

6.1 KEY OVERALL FINDINGS

This thesis highlights that the aspirations and needs of youth is an opportunity for transformation in the food system. It shows that livelihoods in the current food system are associated with shame and hardship, but argues that food system transformation provides opportunity for youth to craft dignified and sustainable livelihoods in the future. However, the narratives collected in Chapter 3 as well as the learning networks which emerged in Chapter 4 also suggest that youth and support organisations underestimate how hard successful sustainable farming actually is. Furthermore, when it comes to alternative types of farming (organic/agroecological), the thin knowledge base underpinning these presents an additional systemic disadvantage. This dearth of experienced practitioners as well as appropriately qualified teachers and extension agents is a restraint on youth and training institutions. It also has has serious implications for food system transitions.

Accepting that the transition to a socially just and ecologically sustainable food system is a knowledge intensive undertaking, raises questions about how to equip youth for this challenge. In the first instance: Where will the knowledge for an agrarian transition come from? And, given the current focus and limited reach of conventional training institutions, how can a significant number of youth be connected to the requisite knowledge? This question of where the knowledge for transitions will come from requires radically different approaches given that 90% of African youth will have no formal tertiary qualification when they commence their working lives.

Seen from the MLP perspective, the youth employment crisis in South Africa, as well as more broadly on the continent, represents a exogenous 'landscape level' pressure which will impact on the way in which the current food regime evolves.

By and large, current training and support services in the food system already are, or are being encouraged to become, employment focussed (Minde *et al.* 2015). However, in striving to align training and support services with the changing employment needs of a corporatised food regime, well-intended training institutions may contribute towards underpinning the unsustainable trajectory of the current food system. While the logic of matching training with work opportunities may seem logical in the short term, taking a longer, systemic view on unemployment and the failing food system suggests this logic is flawed and that it will reinforce the negatives of unemployment, poverty, inequality, injustice and unsustainability.

Presently the flaws in this logic, along with the trend towards agricultural job-shedding that characterises the current food regime, may be more apparent in places like South Africa than in countries with more vibrant smallholder farming sectors. This is due to the advanced stages of food system consolidation and industrialisation brought about, in part, by apartheid and the opening up of the sector to "market forces" after democracy. However, while this difference in national levels of consolidation may be the case at present, 'growth opportunities [beyond South Africa] have driven both farming and agribusiness capitals to move into other African countries, attempting to reproduce agro-food systems similarly centred on the dominance of large capital' (Hall & Cousins 2018, p12).

The evidence reviewed in this thesis suggests that nurturing and scaling the transformative potential embedded within sustainability niches is central to achieving positive systemic transitions. Yet, because a transition to a sustainable food system will be a knowledge intensive process (as argued in Chapters 2, 4 and 5), achieving a meaningful transition to a sustainable food system will require training that breaks current systemic lock-in and builds the skills needed to disrupt the current unsustainable trajectory. Due to the significant numbers of people in need of employment, and the shortage of trainers with the necessary transitional competencies, radical new models of capacity development are required. These models need to be able to amplify and transfer tiny pockets of place-based experience to very large audiences in a cost-effective manner. To do this, these new capacity building models will need to be able to operate both within the struggling formal training and extension sectors as well as beyond them in new formations. In thinking beyond existing formal capacity building models, the research suggests the need to think specifically about how to support and empower local civil society, farmer-led organisations and aspirant farming communities with new tools for amplifying latent and fragmented knowledge resources in their specific contexts.

6.2 OVERVIEW OF THESIS

This thesis was divided into three distinct but complementary journal articles, supported by a literature review that provided the theoretical grounding for the thesis. The discussion presented in Chapter 2 drew together a diverse set of literature on systemic transitions, the food system, youth and learning. From this it presented a conceptual framing for investigating potential training opportunities to empower the youth in driving systemic change in the food system, while at the same time creating sustainable employment opportunities.

Chapter 3 presented the first article entitled *We're ready, the system's not – youth perspectives on agricultural careers in South Africa*. In recognition of the absence of empirical data on youth attitudes towards work in agriculture the paper sought to understand young people's attitudes, experiences and expectations of work in the agricultural sector. In the simplest terms, it posed the question: Are South African youth interested in careers in the agricultural sector? It took a narrative based approach based on a sample of 573 youth from across the KwaZulu-Natal, Limpopo and Western Cape provinces of South Africa.

Chapter 4 presented the second article entitled *Learning for transitions: A niche perspective,* which built on the findings of the first paper. It sought to understand how successful sustainability pioneers learn and innovate outside of mainstream training institutions. A particular emphasis was on the ways in which new skills and competencies are developed and disseminated within emerging niches. A network and power-mapping tool was used to investigate this in an emerging sustainability niche in the South African food system.

Chapter 5 presented the third article entitled *Net-Map: A frontline tool for supporting place-based learning in sustainability niches,* which sought to better understand how the valuable, experiential knowledge of sustainability pioneers can be more effectively used to accelerate wider systemic change. This paper explored the potential use of the Net-Map approach as a supportive tool in promoting learning for sustainability transitions.

The key findings and implications from each of these three articles are laid out in Table 6.1 below. The findings and implications presented in this table are drawn together in the remainder of Chapter 6.

Table 6.1: Key findings and implications from each of these three articles

Paper # & focus	Key findings	Implications	Cross cutting links to next paper
Paper 1. Youth Narratives on careers in the food system	• Youth attitudes towards careers in agriculture vary greatly. • Approximately one third of the surveyed youth expressed a clear interest in agriculture. • There is a vocational element to youths' interest in agriculture which persisted in spite of a range of pervasive social norms and stigmas. • Youth's positive aspirations for work in the sector tended to differ to the kinds of jobs created by an increasingly corporatized food regime. • Currently the agricultural sector remains a source of disappointment, uncertainty and humiliation for enthusiastic youth who attempt to engage in farming on their own as well as those seeking wage labour on commercial farms. • Black youth and their families have very few positive role models to draw on in the agricultural sector, largely becasue so few success stories exist in their communities, and big agriculture is still dominated by distant white farmers.	Primary recommendation: Interests and expectations of youth are sufficient to warrant state investment into engaging them as active co-creators in the re-design of the food system based on the principles of accumulation from below (see section 2.2.4). Youth recommended: • Career guidance and information at school level to assist them in making informed decisions about their futures. • Support to study agriculture and other related fields. • More job opportunities in the sector. • Better support in the form of start-up inputs, extension services and drought relief to those who do start their own farms. Additional recommendations: • Increase the visibility and access to mentors and role models to youth and their families. • Improved support and investment into a relatively prolific set of aspirant micro-farmers and agricultural entrepreneurs. • Methods of grassroots learning and information sharing are needed that are capable of transcending education and extension services beset with long-term structural challenges. These need to focus on holistic learning at a family level instead of focussing on the notion of an individual farmer.	Youth are interested, but a new kind of food system will be needed for this to work.

Paper 2. Knowledge Networks in a South African niche	• Practitioners such as farmers, input suppliers, and alternative retailers lead innovation within South African food system niche networks • Formalised training institutions and state supported extension services were absent from niche knowledge networks • Niche knowledge in the SA food system is often fragmented and poorly documented, which limits diffusion • The absence of teaching resources and capacity within the niche environment impedes the spread of niche innovations within and beyond the niche • Niche learning networks offer valuable insights for wider educational innovation	• Support the documentation of validated practitioner knowledge in niche environments • Empower and support youth to connect to informal communities of practice within sustainability niches • Support trainers within existing training institutions appreciate the value of niche spaces and support them to navigate these • Encourage investment into knowledge/information brokerage in niche spaces • Invest in initiatives that niches map, record and disseminate their knowledge – eg JMF Market Gardeners Success Group / Document and digitise pioneer knowledge	Rich and relevant knowledge exists in the niche, reflecting the kinds of careers that youth were looking for in paper 1. However, there are very few opportunities for youth to access this niche knowledge and develop the relationships and competencies they require to succeed. New ways of connecting youth to niche spaces are needed.
Paper 3. Net-Map tool for navigation niche learning	• Experience with the tool allowed for modifications to improve its effectiveness in educational contexts - Net-Map Learning Landscapes • Net-Map in its current and/or adapted form could serve as a potential low-cost support tool for niche knowledge brokers to achieve recommendations 1-5 above	• Pilot Net-Map Learning Landscapes among training institutions, civil society organisations, government extension workers and other knowledge brokers working in niche environments • Feedback results to develop an empirical basis for further improvement of the toolkit	Net-Map Learning Landscapes could assist in linking youth to niche knowledge as well as supporting knowledge brokerage within niche environments

6.3 NOVEL CONTRIBUTIONS: SYNTHESIS & SUMMARY

6.3.1 THEORETICAL CONTRIBUTIONS

This thesis drew together a diverse set of literatures on systemic transitions, the food systems, and youth and learning. From this it presented a conceptual framing for investigating potential training opportunities to empower the youth in driving systemic change in the food system, while at the same time creating sustainable employment opportunities.

Chapter 3 drew on this broad framework in order to present a more specific theoretical framework for understanding youth experiences surrounding agricultural career choices in South Africa, one of the first studies of its kind. This framework reflects youth narratives and incorporates factors that motivate and demotivate aspirant youth along a progression between total ignorance of agricultural careers and successful engagement with farming.

Using the food system as an example, the thesis built on existing research on knowledge transfer in Sustainable Niche Management (SNM) to develop the concept of knowledge intensive transitions (in Chapters 4 and 5). Chapters 4 and 5 suggest the need to consider the breadth (how many system actors need to acquire new knowledge), depth (the volume/load of new knowledge each actor requires) and accessibility (the availability of relevant knowledge and teaching capacity) of knowledge required for a transition as a defining factor in systemic transition theory. The importance of considering knowledge intensity is particularly acute in contexts where educational infrastructure is weak and base levels of literacy are low. This related specifically to the food system, where institutional capacity to support knowledge acquisition appears to be failing despite the substantial depth and breadth of new knowledge acquisition required to successfully achieve an agrarian transition.

Building on this perspective, the work presents new insights to reconsider approaches to sustainability education in developing country contexts. Pairing data from Chapters 4 and 5 with work on sustainability transitions (Van de Bosch & Rotmanss 2008; Moore *et al.* 2015), and sustainability education (Sobel 2004; Gruenewald & Smith 2014; Moschitz *et. al* 2015, Lotz-Sisitka 2017), it demonstrated the need for low-cost educational methods that were simultaneously place-based and scalable.
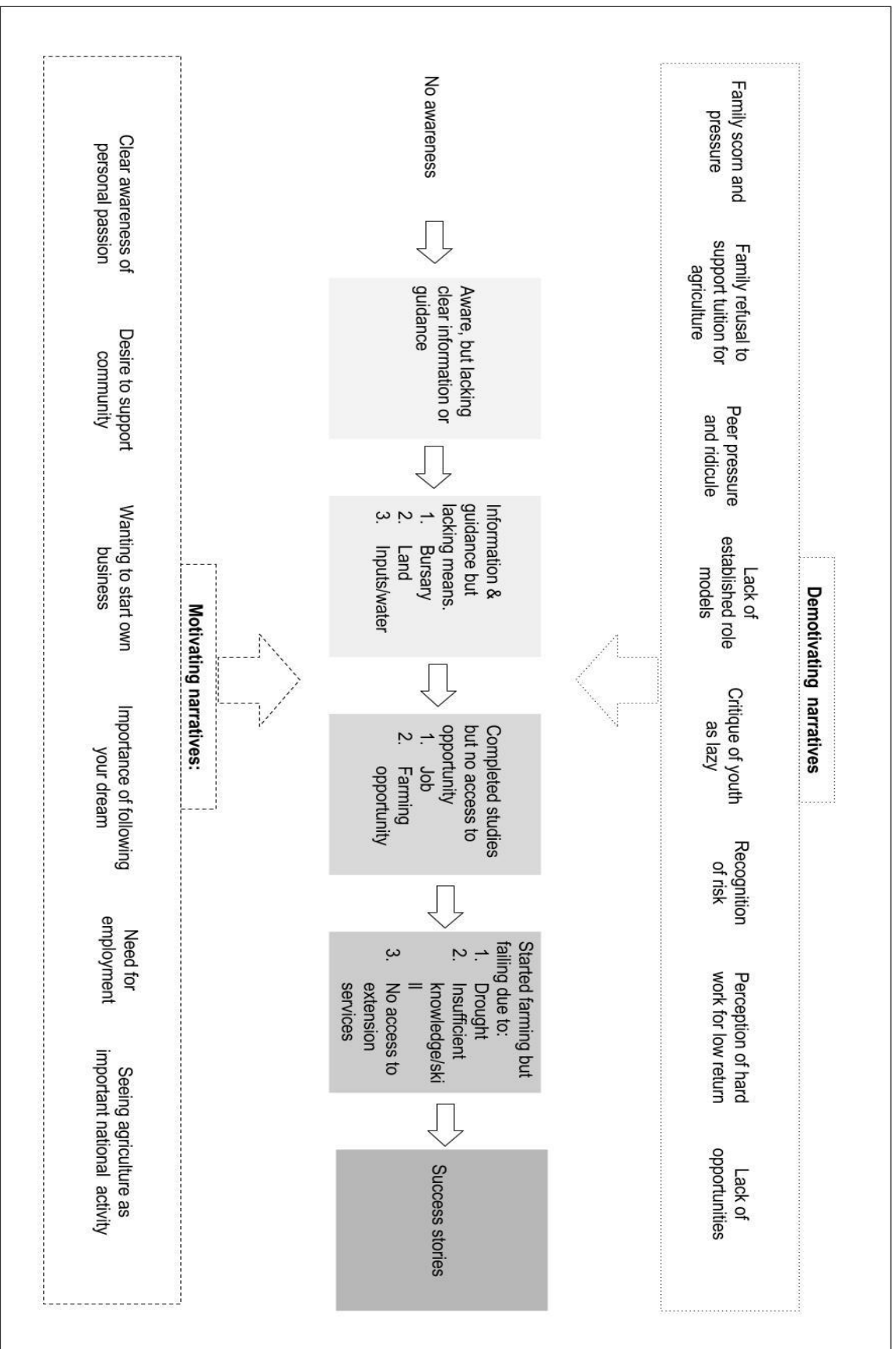
Figure 6.1: Conceptual synthesis of youth experiences as they pursue careers

6.3.2 *METHODOLOGICAL CONTRIBUTIONS*

This thesis used two existing methods, Net-Map and SenseMaker, and applied both in contexts. It also applied Net-Map in a novel way. In doing so, it expanded the set of tools available for investigating.

Net-Map

Chapters 4 and 5 present a new approach for mapping the learning component of a niche's ability to challenge the prevailing regime. Using Net-Map, this thesis presents a novel approach for identifying actors, relationships and influencers at a niche level. This was applied specifically to the consideration of knowledge transfer and learning at a niche level, and the effects this had on that niche's ability to 'stretch and transform' the current food regime. This novel application of the social network and influence mapping abilities of Net-Map led to the development of the NetMap Learning Landscape (in Chapter 5). This presents a modified version of the standard Net-Map approach into an easy to use tool in order for grassroots educators. It incorporates power, place and informality into a networked understanding of the knowledge resources and relational competency networks that that underpin emerging sustainability niches.

From a learning perspective, the Net-Map process can be seen as way to broker knowledge through the co-creation of a tangible artifact in the form of a network map. This is open to various means of analysis and interpretation allowing system stakeholders to shift from participant, to observer and back, blurring the lines between objectivity and subjectivity. Through this, the Net-Map process enables the evolution and production of both a learning artifact and a narrative. These artifacts and narratives demonstrate practical ways to transcend social and educational boundaries and arrive at coherently relatable stories, reinforcing the utility of this methodology. The process enables the production of accessible artifacts to act at boundary objects to readily interrogate how to manage transitions.

Furthermore, this thesis demonstrated that it offers a structured approach through which niche knowledge brokers and activists can themselves come to understand the state of knowledge within the spaces they work and then in turn, connect this valuable pioneer knowledge to much wider audiences in a simple and cost-effective way. Because, as Chapter 4 demonstrated, sustainability niches are fringe spaces occupied by radical and unconventional thinkers, knowledge in these spaces is often fragmented and confusing. The effectiveness of participatory mapping in these contexts is that the system becomes clearer to its stakeholders through the process; the co-sensing of the system and 'seeing others seeing' to allow new ideas to emerge.

As with all field methods, there are dangers in this too. Net-Map creates an 'understanding' framed by a question, a facilitator and the participant(s). This ability to frame collective understandings, makes the method vulnerable to manipulation by facilitators and intentional misrepresentation by participants.

SenseMaker

SenseMaker is a method supported by a software package that is designed for the collection and self-signification of micro-narratives. Self-signification, is used in reference to SenseMaker to describe the process of respondents attributing meaning to their own stories.

The importance of niche narratives as political and educational devices has been referenced throughout this thesis by transition theorists (Van der Bosch & Rotmanss 2008; Smith and Raven 2012; Moore *et al*. 2015). Smith and Raven (2012) in particular, speak of narratives as the political devices through which transformative niches link to wider processes of social change. Nilsson, in considering spaces of social innovation, describes narrative as being part of the 'invisible elements' that are essential to the quality of transformative spaces (Nilsson 2013).

Having applied SenseMaker to this study of youth narratives at a landscape level, the method helped shed light on prevailing social narratives at this macro-level. For niches this enables local-level interpretation of these prevailing narratives. From a transition perspective, it offers a means of amalgamating stories from individuals affected by a particular social issue into a resonant socio-political framing of societal beliefs and opinions. These attributes may make it useful to those seeking to identify pertinent social values and concerns as they lobby for change within regime-level institutions and the broader cultural landscape.

An important strength of SenseMaker compared to other exclusively qualitative narrative methods was the relative ease in which narrative collection and signification could be done at scale, across a system. Because the SenseMaker software permits people sharing their narratives to code their narratives themselves, the need for intensive retrospective coding required by other narrative analysis packages, such as AtlasTI, is eliminated.

6.3.3 EMPIRICAL CONTRIBUTIONS

Chapter 3 provides the first empirical study showing substantive interest among youth in agricultural careers at a national level in South Africa. This data challenges the commonly held belief that youth are not interested in agricultural careers. While this belief does appear to be representative of around two thirds of South African youth, the data also clearly indicate a substantial number of South African youth are interested in careers in agriculture - but largely not in its current commercial or traditional forms. Over and above the social norms and pressures emerging from the narratives, these youth perspectives indicate that "turning away" from agricultural employment is not paradoxical; it is the result of a complex set of pressures which outweigh their own internal desires. In essence, youth feel trapped between two opposing forms of "slavery" when it comes to land-based livelihoods.

On one hand, trapped in a system dominated by 'white bosses' in a supposedly 'advanced' commercial agricultural sector in which 90% of jobs are at a minimum wage and that require no more than matric and often minimal primary education. On the other hand, trapped in an historically under-resourced and marginalised traditional farming sector which is poorly supported by the state in a challenging, free-market economy.

Beyond questions of political and social will, it is recognised that there are numerous barriers facing youth relating to aspirations in agriculture. In addition to the substantial structural challenges such as access to land and markets (Aliber & Hall 2010), Chapters 3 and 4 highlight that a key barrier to this kind of transition are the competencies youth require to realising their aspirations.

The Net-Maps presented in Chapter 4 also highlight the positive influence of symbiotic partnerships between spouses who take on different roles within a farming enterprise. Along the same vein, communal social networks of support and reciprocity also influenced farmer's success. This is important in considering the competencies required for transitions because it suggests that competencies required are not realistically going to be manageable by a single individual. The knowledge, time and personality demands are simply too broad. Success, Chapter 4 suggests, demands dual personality types with individual competency specialisations. This points toward the need to invest in local knowledge networks building symbiotic collaborations across scales: from the individual, to the immediate family, to extended family and wider community.

These research findings also present the first look into the structure of the learning networks within niche spaces in South Africa. This yielded a number of insights which were presented in Chapter 3:

- Practitioners lead innovation within sustainability niche networks and are most often the most qualified to teach although they have limited capacity to do so
- Traditional formal knowledge actors are absent (state & universities)
- Niche knowledge is often fragmented and poorly documented, which limits diffusion
- The absence of teaching capacity impedes the spread of niche innovations
- The absence of teaching resources impedes the spread of niche innovations
- Niche learning networks offer valuable insights for wider educational innovation

This implies that there is need to:

- Support the documentation of existing practitioner knowledge
- Connect youth to informal communities of practice
- Support existing training institutions to appreciate the value of niche spaces and support them to navigate these
- Encourage investment into knowledge/information brokerage in niche spaces
- Invest in initiatives that assist niches to map, record and disseminate their knowledge – eg. JMF Market Gardeners Success Group
- Recognise and promote the contribution that food system niches make to agricultural innovation and research - particularly in emerging economies where public research is under capacitated.

These and other implications are discussed in more detail in section 6.4.

6.4 IMPLICATIONS FOR DECISION MAKERS

The overarching research findings support an agenda for strengthening capacity among local food system niches (along with the informal and formal institutions in close proximity to them) to better support youth into commercially oriented agriculture that is capable of intensifying production sustainably without the need for consolidation of farming operations. The findings from Chapter 3 indicated that the attraction to agricultural careers is about more than making a decent income. Young people care about the communities they live and work in. Many see

growing food as a chance to support these communities and realise a greater sense of social purpose in their lives. .

Supporting this is a far reaching undertaking that will require, among other things, the recognition of the following points.

6.4.1 YOUTH INTEREST ALIGNS WITH SUSTAINABILITY TRANSITIONS - CELEBRATE YOUTH & ALIGN WITH THEIR INTEREST

Considering the findings relating to youth values and aspirations in Chapter 3 against the literature reviewed in Chapter 2, points to an alignment between the kinds of careers youth are interested in and a food system transformation based on the principles of the principles of accumulation from below. The fact that more youth were interested in starting their own business than finding stable employment and just over a third of youth conveyed positive attitudes towards careers in agriculture is significant in the context of the region's agricultural future.

In spite of pervasive stigma, the agricultural sector represented a potentially interesting and symbolically rewarding career path for as many as one third of youth respondents. However, youth do not dream of becoming minimum-wage labourers on large commercial (and white-owned) farmers. They aspire to owning small businesses that generate a decent income while supporting their communities and connecting them to the land. The values youth aspired in their careers also suggests alignment with the types of socially just and, to a lesser extent, environmentally sustainable forms of agriculture, which agroecology and food sovereignty movements advocate for (La Via Campesina 2007; Altieri 2009).

Beyond the innumerable intrinsic benefits of nurturing spaces in which young people can productively engage in practices of 'soul, society and the economy', there are two significant reasons why youth interest in alternative food systems represents an important opportunity for food system transitions. Firstly it could dramatically expand the number of actors constructively engaged in bringing about change - providing young energy, creativity and a healthy dose of idealism to an ageing sector (Sihlobo 2015). Secondly, from a transitions perspective, youth interest in a different kind of food system represents a powerful political narrative around which to mobilise political impetus for change.

6.4.2 FOR POLITICAL WIN-WINS ALIGN NICHE AND YOUTH NARRATIVES

Understanding the youth employment dynamic as a landscape-level influence on the food regime, as viewed through the MLP (as well as other transition frameworks reviewed in Chapter 2), implies that leveraging this landscape level pressure to the advantage of sustainability niches will require the construction of bridging narratives. These narratives connect niche solutions and values to landscape-level realities of what it means to be a youth in South Africa today. Youth's explicit interest in community orientated small agri-business (covered in Chapter

3) is one such narrative. This narrative has the potential to constructively politicise the sustainability niches in the food system to the benefit of youth, society and the environment.

Beyond the price of food and land reform, questions of food system sustainability are not high on the policy agenda, but the youth employment crisis is. Positioning sustainability niches within the food system as a potential solution to the challenges faced by youth may assist in building political and societal momentum around food system transformation.

However, growing the niche to a scale that makes a significant difference to youth at a national level require a range of social, political and institutional changes to the current structure of the food system. The political momentum around the dreams and livelihoods of youth could become a leverage point from which to push through systemic barriers in order to 'stretch and transform' the existing food system to enable the growth of existing sustainability niches.

In considering leverage points for niches in the food system, Chapters 2 and 3 argued that the crisis faced by youth is one particularly compelling political narrative. However, the question of youth is not the only such leverage point. There may be equally compelling (and complementary) narratives to be built around the ability of food system niches to support broad based land reform, and, in light of recent water shocks, the employment intensity of available agricultural water. However, in order to politicise narratives that question corporate consolidation at an ideological-level, alignment with much broader social narratives around decolonisation may need to be made. Having established youth's interest in the food system, the most logical next step in building a powerful ideological narrative may be in that direction. The argument that may still need to be clearly and empirically articulated is 'A consolidated food system is a colonized food system'. This narrative surrounding the decolonisation of the food system offers a potentially powerful basis for mainstreaming agroecological approaches that foster independence from intensive external farming inputs.

Linking these points on the politicisation of the niche, it is important to refer back to the three policy documents covered in section 2.5. The National Development Plan, The National Youth Policy and the new National Extension and Advisory Services Policy all contain the necessary 'hooks' onto which more politically assertive niche narratives could be hanged. The potential value of this should not be overlooked. However, because these documents are broad and inclusive they also contain hooks onto which counter narratives are also being woven - often by powerful interests with interests in the dominant food system. The space is deeply contested and the work of contestation is taxing. For a niche space in which financial and institutional resources are often scarce, finding ways to fund and support this critical niche activity is an area of concern.

6.4.3 KNOWLEDGE INTENSITY IS A SCALING CHALLENGE

Wider systemic challenges notwithstanding, part of the reason many previous attempts to foster new agricultural enterprises among emerging black farmers have failed (Aliber & Hall 2010; Lahiff & Li 2012) is that existing initiatives in policy and capacity building have underestimated the knowledge intensity that success requires. The depth and breadth of

competencies required to transition from subsistence to livelihood farming in the current market environment are substantial. Achieving financial profitability through climatic ups and downs requires skills that span small business management, financial planning, agronomy, chemistry and physics. In total, a far broader skill set than most other careers. Achieving financial profitability in ways which are socially and ecologically regenerative demands that on top of these skills farmers (or perhaps more accurately families and communities who farm) possess a deep ethical commitment paired with tenacity, creativity and sensitivity. Yet despite its highly demanding nature the traditional image of agriculture is of something primitive and antiquated; a career path 'of the elderly' to use the words of many of the youth surveyed in Chapter 3.

The learning networks in Chapters 4 and 5 demonstrated the that informal learning networks in the food system niche that was studied were highly adaptive and efficient. However, as effective as they are in context, the work of scaling out and deep will place a hugh teaching burden on the existing niche. In order to scale out the knowledge and competency sets that underpin alternative systems new grass-roots approaches to transfer and *amplification* are needed.

One-on-one farm apprenticeships, as desirable and effective as they are, cannot remain the primary means through which pioneering practitioners pass on their knowledge. There is a need to consider how to increase the 1-1 nature of this engagement to factors of 1-100 and more. Given the need to increase the impact of pioneer knowledge exponentially, the documentation and digitisation of pioneer knowledge seems like a particularly low-hanging fruit. New methods should be capable of working in partnership with existing regime actors such as state led extension services and established tertiary institutions, but without reliance on them.

Chapters 4 and 5 suggest that this may mean further developing civil society organisations while concurrently providing investment and support into niche networks and the pioneering system activists that drive them. Examples of this from the South African context could include national and provincial participatory gaurentee system (PGS) networks and sector bodies like the South African Organic Sector Organisation (SAOSO). It may also mean academia in particular could play a critical 'pollinator' role. By shifting from a knowledge creator to a knowledge pollinator specically in the South Africa food space, academia could lead efforts to validate, document and disseminate practitioner led innovation. This could accelerate the pace at which niche innovation can find its way into institutional curricula. Chapter 4 also indicates a potentially important role for private sector input suppliers.

However, in considering approaches to scaling, Nilsson cautions that, 'It's not only about scaling the visible, but also the invisible. We can't just look at observable, tangible things like projects, products, programmes, organisations.' (Nilsson, 2013 p1). He draws attention to the need to consider the people, experiences, stories and relationships at the heart of what it is we are trying to scale.

6.4.4 RECOGNISE THAT MOST EXISTING TRAINING AND SUPPORT INSTITUTIONS REINFORCE THE DOMINANT REGIME TRAJECTORY

Chapter 4 demonstrated that whether by design, circumstance or neglect, the established institutions tasked with supporting the knowledge needs of a transformative and innovative agricultural economy (universities, extension programmes, agricultural research centres, etc.) were absent from the knowledge economy of the niche. Chapter 3 corroborated this evidence. It suggests that when it came to youth narratives on agriculture, these established institutions *also* appeared to be largely absent from the lives and struggles of marginalised youth.

Recognising this does not imply an indictment on these actors. In many cases there are clear reasons for this. While the research did not explicitly explore these reasons, literature suggests these may result from a focus on aligning training with existing sectoral employment opportunities within the current food regime ('realities of where jobs are'), lack of understanding of alternatives, differing economic ideologies and lack of relevant skills.

However, the fact that such a clear gap exists suggests some degree of institutional lock-in is taking place that is serving to perpetuate the existing structure of the system . Through this systemic lock-in the dominant system reinforces itself through its pervasive influence over existing institutions and actors.

By definition, attempting to spread niche knowledge implies that the majority of actors in a system will not possess a working knowledge of the new skills and competencies emerging from within the niche environment. If support organisations are serious about supporting innovation with transformative potential, this implies two things:

Firstly, that for those mandated with supporting innovation, there is a need to develop capacities of support that are focussed on methodologies for knowledge brokerage rather than transfer. This means understanding that to support knowledge transfer, one does not have to possess complete knowledge oneself. What is required is the ability accurately to identify, validate and share the knowledge embedded in a particular niche. Place-based pedagogies speak of the genius loci - the spirit/wisdom of place - which implies that the best learning emerges when one is able to deeply connect learners to context and the diverse experiences that exist there (O'Connor 2004, Gradel 2007).

From a developmental perspective this place-based approach exhibits clear parallels to Asset Based Community Development (Kretzmann and McKnight 1993). Asset Based Community Development asserts that the primary responsibility of the developmental practitioner is to support the communities they serve to bring to bear the knowledge and experience already embedded in their context.

In this case however, the findings from the Net-Mapping (in Chapter 4) indicate that the notion of a contextual community of practice needs to be broadened to include global digital resources available to local actors. This would extend the community assets to include regional and international actors to form part of the niche community of practice. While the scope may include more distant actors, the starting point for the exploration begins with identifying successful pioneers within a given context and then mapping out the knowledge networks

relevant to them in their context. These will in turn, lead the educational practitioner to the most relevant global resources to that context.

Secondly, given the current institutional lock-in there may be a need to reconsider conventional assumptions about which kinds of institutions are best placed to support niche knowledge transfer. Choosing to direct support for niche scaling through existing niche actors who are aligned ideologically and practically with that niche may yield better results than utilising institutions considered 'reputable' under the current regime.

6.4.5 RECOGNISE THAT SYSTEM CHANGE IS BEING SUPPORTED BY UNEXPECTED ACTORS WHO LEARN COLLECTIVELY AS THE NICHE MATURES AND GROWS

Chapter 4 indicated that a substantial volume of valuable new knowledge had been generated to fill the vacuum left by the formal training and research. This ranged from knowledge about local adaptations of crop rotation practices and cost effective approaches to certification at a farm level, all the way through the system to the development of new retail models and approaches to local community engagement. However, this knowledge appears to reside in fragmented pockets of partial completeness, distributed across the system among local practitioners.

The latent knowledge in these spaces is a significant resource in the drive to transform the food system, one that is being underutilised at present.

This knowledge resides across a range of actors in the system. These actors included input suppliers, civil society organisations, local farmers, digital resources from other parts of the world and alternative retailers. Considered collectively these constituted a collaborative economy based on a deeper set of loosely defined shared goals and values. Displaying a level of co-dependence and reciprocity that went far beyond economic rationalism, they reflect work and sacrifice aligned with a values driven vision for the food system.

Chapter 4 suggests that in the exceptional cases where leading food system pioneers had managed to document and publish their experiences, this had a considerable impact. For example, the video tutorials and downloadable textbook based on Jean-Martine Fortier's highly successful 1.4ha farm in Canada (Fortier 2014), featured more prominently in the organic farmers' knowledge networks than all of South Africa's large agricultural universities combined (see www.themarketgardener.com). Similarly, local agroecologically oriented input suppliers like seed, compost and pest control representatives played a big role in supporting sustainability pioneers.

Both of these points suggest that small community-level investments into pioneer knowledge documentation and organic/agroecological input supply could yield better returns than investing into large central training and research institutions. By helping to identify which actors are making a real difference to the niche, Chapter 5 suggests that as a method, Net-Map can also serve as a useful tool in guiding investment into these grass-roots resources.

In brokering access to these kinds of network resources, civil society organisations played an important role, particularly for poorer farmers with less experience and fewer networks.

The power and importance of intimate family and friends came out in both the SenseMaker (Chapter 3) and Net-Map (Chapter 4) data in different ways. For both youth yet to enter the farming system and the farmers already in it, the intimate social networks with whom they shared their lives were highly influential in both their decisions to enter agriculture in the first place, as well as their success once in it. Conclusions drawn from both the Net-Map and SenseMaker processes pointed to the need to consider learning for transitions as a collective, and communal process which needs to happen across the social network in which individuals who seek to build careers within the niche are embedded. Parents need to be sensitised to, and assured of the potential to deliver stable and dignified livelihoods from the niche space. At the same time, in existing or aspirant farming families there is a need to consider investing in more than just the skills of the main farmer alone. Chapter 4 pointed to the need to invest in the husbands and wives of farmers, focussing on the business and administrative aspects of the agricultural enterprise. Put simplistically, there are two sets of specialist knowledge that require two different people - one focuses on growing a marketable product while the other focuses on the rest. Investing in capacity building should mirror this.

Finally, it was very clear from Chapter 4 that the financial viability of these niche farming enterprises was almost entirely dependant on the existence of an alternative retail sector. These alternative retailers were, without doubt one of the most influential factors in the overall success of the niche. Despite this, they existed with no state protection or investment. Finding ways to support these alternative retail systems which tend to be driven by values before profits, offer far better terms to small farmers than conventional retail chains do. And, amidst the failings of the large commercial retail sector to equitably incorporate small-scale farmers into their value chains, these alternative retail models could have valuable lessons for the wider system. The increasing success of these models pose awkward questions for the formal retail sector. If a single mother with very limited capital and no institutional support can establish a localised retail model capable of not only of accommodating, but actually actively supporting a diverse range of small-scale emerging farmers, then why are the big retailers failing the small-scale farming sector so badly?

6.4.6 INVEST INTO KNOWLEDGE AND INNOVATION BROKERAGE FOR YOUTH-CENTRIC TRANSITIONS

Investment into knowledge brokers with a mandate to support youth centric agricultural innovation within sustainability niches is needed. It has been widely argued that knowledge brokerage is central to innovation in agriculture (see reading notes)(Klerkx *et al.* 2009; Kilelu *et al.* 2011). As leaders in the agricultural innovation, much of the literature around innovation intermediaries and knowledge brokers emanates from the Netherlands. Consequently, increasing focus is being placed on the potential transferability of the Dutch experience into emerging economy contexts. The Dutch experience suggests that the best brokers emerge from the bottom up, and work at the fringes of the system outside of established research and extension services was important to innovation. According to Klerkx *et al.*:
'A striking feature of the Dutch case is that centrally-designed blueprints failed, and that successful innovation brokers (even if eventually subsidised) emerged in a self-organised manner, building on local, regional or sectoral initiatives, and resulting in a very diverse landscape of contextually-embedded innovation brokers.' (Klerkx, Hall & Leeuwis 2009, p32).

The findings from Chapter 4 support this, indicating that in South Africa the most important actors exist outside of established state or university systems.

However, this does not negate the need for stable state support and finance for knowledge brokers and innovation intermediaries, as was also evidenced in the Dutch experience. This suggests need to invest more in supporting emerging niche actors to support innovation. This is a potentially challenging funding objective, but is by no means impossible. As suggested in chapter 6.3.2 above, the insights provided by Net-Map Learning Landscapes (in Chapter 5) may be able to enable and simplify this kind of investment - primarily by identifying influential and valid knowledge brokers in loose and often chaotic networks.

6.4.7 RECOGNISE THAT WORK REPRESENTS MORE THAN JUST AN INCOME

Work is about far more than simply putting food on the table, it is central to the construction and expression of personal and collective identities (Christiansen 1999). Chapter 3 tells us not to underestimate the motivational power that doing work that has social value represents. Work of collective social value matters to young people as they draw meaning from their work and construct identities around their careers. Yes, making a good living matters, but if the narratives of youth are anything to go by, making a social contribution to society is equally important. The data was clear that young people care about more than just the income that a career in agriculture represents. The fact that this aligns with the ethos and practices of the niche network is a potentially powerful force for change within the agricultural sector and should not be overlooked as naive or insignificant. It should also not be overlooked that as the current corporate agriculture sector expands, the kinds of jobs youth will be able to find in the agricultural sector are unlikely to enable or celebrate this communal sensibility. Instead, the contribution youth make to their communities and societies throughout their working lives will be limited to the often meager wages they bring home at the end of a monotonous day's labour. At the same time, however, the apparently low levels of concern for the environmental elements of the food system represents a potential mismatch between the general values of youth and those of the niche.

Decision makers need to think about building on the ways that public messaging and support mechanisms are used to honor and develop youth's holistic motivations for involvement in the sector. In other words, to demonstrate that developing a small farming business affords an opportunity to secure a livelihood while supporting one's community and environment. There is a well-developed language and conceptual grounding for this within the field of agroecology which could be drawn on in efforts to coherently unify the agricultural and anthropocentric elements.

6.5 LIMITATIONS OF THE STUDY

This section covers two main areas of limitations this study. Firstly the limitations to the scope of the research and secondly, some reflections on the limitations of the methods in this context.

6.5.1 LIMITATIONS IN SCOPE

Limited focus to the agricultural segment of the niche system

Both the niche mapping and youth narrative data focussed on the agricultural component of the wider food system niche. From an employment perspective there are a wide range of other career options in emerging niches in the Agri-food system beyond the on-farm jobs that were the focus of this study - specifically in alternative retail, agroecological/organic input supply and processing. Currently, the findings of this paper suggest that around 30% of youth surveyed are interested in careers in agriculture. However, when thinking about the food system more broadly, to include the input supply chains, value adding, transportation, marketing and retail for example, many other opportunities open up. Some of these jobs may be attractive to youth not interested in on-farm jobs. Understanding these other opportunities could go a long way to increasing the number of youth able to align their personal interests and aptitudes with careers in the niche food system in ways that can also contribute to sustainability transitions in the sector.

The Net-Map Learning Landscape may overlook a number of foundational and soft skills

Basic skills such as numeracy and literacy were largely assumed to exist as a default condition among respondents. Given the low levels of functional numeracy and literacy in South Africa, this methodological omission needs to be considered during the interpretation of results. What this means in practice, is that the competency networks which the Net-Map Learning Landscape generates cannot be considered as a guide to what success in a particular field requires. They are indicative of a set of vocation-specific competencies. The underlying educational foundations (such a mathematics and literacy) that may need particular attention should be evaluated and supported in parallel.

Similarly, soft skills including interpersonal skills, personal professionalism, time keeping, entrepreneurial aptitude and self-awareness are also key to success of any small enterprise. For many unemployed youth, these skills are a persistent challenge (Harambee personal Comm 2016; NYDA 2015). By the very nature of selecting leading system pioneers to determine the influential actors that affect their success, the inherent soft skills which these pioneers entered their farms with are overlooked.

Limited discussion on the role of power

As was shown in section 4.3 Net-Map serves as a network and power analysis tool. In the context of this thesis, the ability to map out power relationships was limited to understanding the influence which actors had on the knowledge landscape. Given the power of Net-Map and the nature of the data that was collected, more could have been said about the power relationships within the niche. Given the limitations of this work and the need to retain a clear focus, an editorial decision was made to limit the scope of the papers and discussion with regards to power more broadly.

For those interested in discsussion on power in relation to the MLP, Grin *et al. (*2010) provide a detailed exploration of this topic.

6.5.2 LIMITATIONS OF METHODOLOGY/APPROACH

SenseMaker:

Four observations around the limitations of the SenseMaker method emerged from its application in this thesis.

Firstly, the narratives shared are micro-narratives, not long and detailed accounts. While this facilitates a level of scalability not afforded by approaches that favour more extensive narratives, the limitation of this needs to be recognised. It does not yield the kinds of detailed, in-depth narratives that many narrative-based researchers may be used to working with. The method does allow for individual narratives to be considered. But, it is ultimately geared towards the collection of narratives symbolic of a community or broader social narrative. As such it is not well-suited to the collection of narratives where an understanding of the individual characters is the primary intention. Nor, in situations where less than 80-100 narratives are available (Stanbridge 2016).

Secondly, the foundational principle of the method is that the signification framework (developed by the researcher) allows respondents to self-signify their own stories. However, the link between the answers provided in the signification framework and the story itself were tenuous at times. In practice this meant that respondents would sometimes use the signification framework to express their own opinions about the questions being posed, independently of the story they had shared. While it could be argued that in most cases opinions of the respondents and the opinions implicit in the stories they shared are likely to be one and the same, a subtle difference remains.

This did not fundamentally undermine the overall intention of the process (which was to gleam insights into the opinions of youth through the narrative based survey). However, it did undermine the integrity of the method to some degree because it blurred the connection between the quantitative signification framework data and the qualitative narrative data. This limitation meant that in the interpretation of the data, care needed to be taken not to draw conclusions that were overtly dependant on the nature of the connection between the story and the signification framework.

Thirdly, while the method does attempt to use story sharing as a way to reduce gaming by participants, substantial room still existed for gaming. This was particularly true in our case, where respondents were often unemployed youth who were eager to please anyone they felt might provide access to an opportunity for training or employment.

Lastly, the software is costly to licence and the backend system is reliant on a software support team in Singapore. Although the support team were very helpful, the centralized/proprietary management and processing of the overall dataset was a barrier at times. For example, there

were instances where retrospective disaggregation of the sample would have enabled deeper insights than were possible with the current setup.

6.6 FUTURE RESEARCH DIRECTIONS

A number of future research directions emerge from the work in this thesis. Sections 6.6.1 to 6.6.4 outline four key strands. These cover:

- The generation of further data to support niche narrative building in 6.6.1
- The development of a roadman for growing food system niche niches as sites of innovation and learning in South Africa in 6.6.2
- Piloting alternative learning approaches in 6.6.3
- Improving understandings collective competency in small scale farming in 6.6.4

6.6.1. NEW DATA FOR TRANSFORMATIVE NARRATIVES IN THE FOOD SYSTEM

This research has begun to build an argument and a narrative around the need to transform the corporate food regime in order to respond to the politically salient problem of youth unemployment in South Africa and beyond, as well as pressing environmental sustainability issues. The food system niche was then presented as one potential alternative that aligned with this politically relevant and socially sensitive issue. However, there is a need to explore other opportunities for deepening the empirically-based arguments to support transformative political narratives in the food system (referred to in section 2.1.5).

Based on the gaps in the current literature, research that advances a transformative narrative in the food system could include:

- **Quantifying the number of livelihoods the alternative food system could generate** relative to the current food regime to understand the employment intensity of niche food system in comparison to conventional food system. Because jobs and land are at the heart of the South African political economy, new agricultural niches need to respond to these issues if they are to succeed
- **Economic modelling of alternative food system enterprises** in order to better understand the financial dynamics of organic/agroecological farms, alternative retail chains, and input suppliers. Providing clear data to support activist claims that these can offer stable and remunerative career pathways
- **Mapping agroecological input supply chains.** The presence of input suppliers who were aligned with the values and ethos of the emerging niche was show to be highly influential in farmer success (see chapter 4). However, in comparison to the agroecological farming sector, and to a lesser extent the alternative retail system, these supply systems have not been clearly mapped
- **Building an ideological bridge** between resistance to food system consolidation and broader social narratives around structural decolonialisation in South Africa.

6.6.2. DEVELOPING COHERENT FRAMEWORKS FOR SYSTEMIC, MEDIUM TO LONG TERM INVESTMENT INTO THE NICHE

The MLP and SNM have articulated the need to consider the ways that niches cross scales and influence the wider system. Currently, the niche food system in question reflects a tiny fraction of the formal food system and remains largely unsupported by the prevailing institutional funding and support instruments. However, in spite of this the niche was an important site of sustainability innovation and social learning. This raises two questions:

3. With well-placed institutional support and long-term investment, how much more could be achieved?
4. What would a roadmap for achieving this look like?

Future research in this direction could bring together theory and the limited body of empirical research on niches that have successfully scaled, and pair it with an in-depth study into the needs of the alternative food system in South Africa. An overarching objective of this would be to develop an inclusive and systematic framework to guide coherent and ambitious funding strategies into potentially transformative food system niches. Some of the work in Chapter 2, building on the MLP could be a starting point for this.

This framework could also assist diverse stakeholders in the niche to understand the complementarity of their particular activities in relation to others. This would enable potential conflicts surrounding mandate, priority and ethos to be ameliorated, thereby supporting stakeholders to operate in a more harmonious and complementary manner.

6.6.3. PILOTING APPROACHES TO SUPPORTING KNOWLEDGE BROKERS AND PLACED-BASED COMMUNAL LEARNING

Connecting to the roadmap alluded to in section 6.6.2, this research indicated a clear need for more active support to existing knowledge and innovation brokers within the niche environment. Building a clearer picture of what kinds of brokerage already exist and how better to support these would be valuable.

In addition there was a clear need to identify and pilot new approaches to skills development in rural and urban areas that focuses explicitly on learning at household and communal level.

This could include, approaches for:

1. Identifying and ultilising local knowledge resources for teaching
2. Embedding teaching resources in rural communities to teach in situ
3. Facilitating better peer-peer knowledge exchange - digitally and otherwise

6.6.4. UNDERSTANDING WHAT HAPPENS IN THE HOUSEHOLD AND WHAT THIS MEANS FOR TRAINING

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Spousal and immediate family partnerships emerged as very important and under-recognised component of success amongst niche pioneers. It received scant attention in the literature, and none of the support organisations in this research identified these relationships as significant. However, according to some farmers, this was *the* most influential actor in determining their success. Yet in spite of this, spousal and family support was completely off the radar of *all* support organisations. This interesting mis-match of perceptions suggests the need for further research into the dynamics of the farming household, and perhaps a reframing of the notion of the 'Farmer Hero', with something more akin to the 'Farming Alliance'.

From a knowledge and learning perspective, there is a need to understand whether there are patterns in the ways in which certain types of specialisation emerge within a farming household. For example: Do certain members of the family consistently do better at certain things? Are there patterns in the way successful farming families organise and relate to one another that could inform more effective training?

6.7 PARTING REFLECTION

The fact that food system niches are emerging to provide increasingly viable alternatives to the dysfunction of the current food regime is a fact to be celebrated. The hard work of proving what is possible, at least at the niche scale, has, for the most part, been done.

In the process of crafting this niche, a school, a classroom and a curriculum have been developed by an unlikely but visionary collection of growers, composters, seed breeders, processors and retailers. The fact that this new *School of Food System Transformation* is not yet visible is a matter of little concern. In fact, perhaps, that's the way it's meant to be.

The real question is what we choose do with the educational potential of this seed? This study suggests that there is a hunger among millions of South African youth, and potentially hundreds of millions of African youth, for participating in the next steps of this journey over the coming 50 years.

So, perhaps as South African musicians Joey Rasdien and HHP say, its now time to 'make the circle bigger'.

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