

**EVALUATING PEOPLE-ENVIRONMENT RELATIONSHIPS: DEVELOPING
APPROPRIATE RESEARCH METHODOLOGIES FOR SUSTAINABLE
MANAGEMENT AND REHABILITATION OF RIVERINE AREAS BY
COMMUNITIES IN THE KAT RIVER VALLEY, EASTERN CAPE PROVINCE,
SOUTH AFRICA**

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ABSTRACT

International evidence clearly indicates that water shortages and the enhanced value attached to water and aquatic ecosystems are key concerns faced by many countries. International experience, since the mid-1980s, has emphasised the importance of addressing political, social, environmental and economic issues through active stakeholder participation in riverine and water resource management.

These trends and issues are relevant to South Africa, where integrated water resource management (IWRM) is now a cornerstone of water resource policy and the National Water Act (NWA). Apartheid excluded communities in former homelands (racial reserves) from participation in IWRM. The research presented in this thesis was based on the search for philosophies and methods to involve the rural, former homeland people of the Kat River Valley in South Africa in IWRM. Post-modern, humanist and some logical positivist geographical philosophies were used during the research.

This research applied Participatory Rural Appraisal (PRA) philosophy and methods and was influenced by the seminal work of Paolo Freire (1972). In addition, the use of innovative methods for engagement of the oppressed, using theatre methods developed by Augusto Boal (1995, 2000) was explored to add value to PRA. In addition, the application of Action Research ensured that community participants were actively involved in the research being conducted for this thesis.

The applied research in the Kat River Valley in South Africa evolved through three key phases. In Phase One quantifiable data on the Kat River Valley and its residents was sought. This investigation did not empower the resident communities of Fairbairn and Hertzog – a lesson that influenced the move to more participatory methods in subsequent phases of the research.

Lessons learned from using surveys encouraged exploration of participatory methods to enable participants to become “co-learners”. Phase Two of the research commenced with a series of feedback meetings, in which participants recognised that they faced an environmental crisis. Through a series of participatory workshops, residents came to acknowledge and affirm their environmental knowledge. Residents then committed themselves to gaining a deeper understanding of their environment and their lives. My role changed from that of a researcher to a facilitator.

Phase Three of the research and the shift to Action Research commenced after local residents identified the need to personally take charge of their environmental challenges in the Kat River Valley and recognised the need to collaborate at a catchment scale for effective IWRM. This eventually led to the formation of a Water User Association and Catchment Forum.

The key theoretical contribution of the thesis relates to the identified relationship between the development orientation and ecological paradigm, and an assessment of the impact this has on the inputs, processes, outputs and outcomes of IWRM. This theoretical contribution is equally valid in other countries, where the tradeoffs are essentially the same, but the framework for making the choices is different because of varying socio-economic and biophysical circumstances

PREFACE

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ACRONYMS

AIDS	Acquired Immune Deficiency Syndrome
AR	Action Research
ANC	African National Congress
ASPT	Average Score Per Taxon
CAMPFIRE	Communal Areas Management Program for Indigenous Resources
CF	Catchment Forum/For a
CMA	Catchment Management Agency
CMP	Catchment Management Projects
CRG	Catchment Research Group
CCRG	Catchment Creative Research Group
ULIMCOR	Ciskei Agricultural Corporation
CBO	Community Based Organisation
CSIR	Council for Scientific and Industrial Research
DFID	Department for International Development (UK)
DWAF	Department of Water Affairs and Forestry
\$	Dollar (United States of America)
FSR	Farming Systems Research
GIS	Geographical Information Systems
GEF	Global Environmental Facility
KAT CO	Kat River Co-operative
HACOP	Hertzog Agricultural Co-operative
HIV	Human Immune-deficiency Virus
IDS	Institute for Development Studies
IUCN	The World Conservation Union
IWR	Institute of Water Research, Rhodes University
IWRM	Integrated Water Resource Management
LDC	Less Developed Countries
KRVP	Kat River Valley Project
MC	Management Committee
MSc	Master of Science
NDA	National Department of Agriculture
NWA	National Water Act (36 of 1998)
NRM	Natural Resource Management
NRF	National Research Fund
NRHP	National River Health Program
NGOs	Non-Governmental Organisations
PhD	Doctor of Philosophy
PM&E	Participatory Monitoring & Evaluation
PR	Participatory Research
PRA	Participatory Rural Appraisal
R	Rand
RRA	Rapid Rural Appraisal
RDP	Reconstruction and Development Program
RU	Rhodes University
TLC	Transitional Local Council

TRC	Traditional Rural Council
SADCC	Southern African Development Coordination Conference
SANCO	South African National Civic Organisation
SAADYT	South African Association of Drama and Youth Theatre
SASS4	South African Scoring System Version 4
SC	Steering Committee
UNCED	United Nation Conference on Environment and Development
UNCHE	United Nations Conference on the Human Environment
UNDP	United Nations Development Program
UNEP	United Natation Environment Program
USAID	United States Agency for International Development
WMA	Water Management Area
WRC	Water Research Commission
WRM	Water Resource Management
WUA	Water User Association
WWF	Worldwide Fund for Nature

1 Introduction

“The dictionary describes water as colourless, tasteless and odourless – its most important property being its ability to dissolve other substances. We in South Africa do not see water that way. For us water is a basic human right, water is the origin of all things – the giver of life” (South African White Paper on Water Policy in Calder, 1999, p. 144).

1.1 Background to the Research

The research for this thesis took place during a time of transition in South Africa. It was a period in which the South African Government began implementing the socio-economic policy supported by the Reconstruction and Development Program (RDP) (Karar & Seetal, 1999). In addition, the South African Department of Water Affairs and Forestry (DWAF) published White Papers (DWAF, 1994; DWAF, 1997) calling for the empowerment of rural people in riverine and water resource management. Reinforcing the significance of this, water has long been recognised as a resource that limits human and economic development in South Africa. While models for best practice riverine and water resource management are available from countries such as Australia, Great Britain and the United States (DWAF and Water Research Commission, 1996), South Africa is faced with a situation in which the majority of the rural population are marginalised in terms of access to water resources and participation in decision-making institutions.

At the same time, other countries and the international community as a whole were debating the way riverine and water resources are managed. The move towards ecologically sustainable development promoted by the Brundtland Commission (Janse van Rensburg & Paxton, 1998) and the Rio Earth Summit (Janse van Rensburg & Paxton, 1998) as well as the changing approach to property rights for water (Calder, 1999) in addition to increasing devolution of decision-making power to water resource users (Calder, 1999) all contributed to a new operating environment for riverine and water resource management in many countries.

The national transition and the international debate led DWAF to recognise that South Africa has a shortfall of relevant capacity, skills and knowledge to implement best practice riverine and water resource management. A major challenge voiced by DWAF is to find effective ways to empower formally marginalised communities so that they can participate meaningfully in the management of

riverine and water resources on which they and others depend for their livelihoods (DWAF & WRC, 1996). This led to calls for research strategies and systems that focus on methods for capacity-building and information transfer to empower marginalised people to enable them to participate and implement riverine and water resource management (DWAF & WRC, 1996; Water Institute of Southern Africa, 2000).

This thesis acknowledges the existence of a gap in participatory methods for riverine and water resource management in South Africa and searches for ways in which formerly marginalised groups can participate in, and actively become part of, management of these resources.

The research started with a focus on riverine management, and evolved towards integrated water resource management (IWRM) at a catchment scale. The research also acknowledges the international benchmarks for IWRM that emphasise the importance of local knowledge and active participation by stakeholders¹. This thesis aims to adapt and trial ideas of integrated catchment management (ICM) and IWRM from other countries to match the social and environmental circumstances in post-apartheid South Africa.

This chapter introduces the physical, social, global, institutional and personal environment in which the research was conducted. It begins with a discussion of South African riverine and water resource management issues in rural areas, building on the policy and priority setting environment expressed by the RDP (ANC, 1994a) and the DWAF White Papers (DWAF, 1994; DWAF, 1997). These encourage rural people to take responsibility for their riverine and water resource management responsibilities in collaboration with other stakeholders.

An outline of the aims and objectives of the study follow this discussion. A participatory philosophy was adopted. As the research unfolded, the intentions, contributions and research design were adapted depending on the local situation and as the limitations in the research data became apparent. In the participatory mode of research, it is important to be explicit about these shifts in order to enable the reader to share in and understand, firstly, the researcher's intentions and, second, how the research evolved and was adapted over time (Popkewitz, 1984; Lincoln & Guba, 1985).

¹ The term 'stakeholder' is one that has been adopted by the DWAF to refer all people living in the catchment, including beneficiaries, institutions, DWAF and other governmental departments communities (DWAF & WRC, 1996).

Further, this chapter introduces my six-year research journey as a process that developed through 'learning-by-doing'. It explains the structure of the thesis as a research map. It then reviews the guiding principles that affected how research questions and issues were approached and comments on the writing of the text, such as the use of 'I', the use of a particular tone of voice, breaking away from the conventional format of theses, the input of grassroots facilitators, the need for confidentiality and the terminology used.

1.2 Setting the Context for the Research

This section provides a background to the physical, social, global and national contexts of riverine and water resources at international and national scales. It then introduces the institutional structures that framed this research. Broad activities are explained and the point is made that the research took place at a time of great change in IWRM in South Africa. Finally, the development of the research into a catchment project providing a platform that allowed further research into the tools and implementation strategies for IWRM is also traced.

1.2.1 Global Trends in Water Resource Management

The freshwater system component of the Pilot Assessment of Global Ecosystems (PAGE), published in 2000 by the World Resources Institute, identified the following trends for global freshwater ecosystems (Revenga, 2000; WRI, 1998):

- Water consumption is rapidly growing
- The value of water is increasing
- Water is already scarce
- Environmental flows are decreasing
- The flow of water is slowing
- There are few wild rivers left
- Wetlands are disappearing
- Biodiversity is at high risk
- Freshwater animals are especially vulnerable to extinction
- Nutrient pollution is a problem
- Groundwater is also important
- Freshwater aquaculture is big business
- Investment in rehabilitation is a growing trend
- Stakeholder participation is essential for effective riverine and water resource management

Recent work by the World Bank (World Bank, 1999; World Bank 1997; World Bank, 1992) identified the following key political, environmental, economic and social issues affecting water resource management:

- **Political issues**
 - Creating political will and good governance for water resource management
 - Balancing competing interests for riverine and water resources
 - Balancing market and regulatory approaches
 - Phasing activities over time and across stakeholders
- **Environmental issues**
 - Biodiversity conservation in aquatic and water-dependent ecosystems
 - Adopting an ecosystem approach to riverine and water resource management
 - Intrinsic values of aquatic ecosystems
 - Low water use efficiency
 - Degrading resource base at a catchment scale
- **Economic issues**
 - Rising price of new water allocations
 - Subsidies and distorted incentives for water use
 - Secure property rights to riverine and water resources
 - Identifying multi-use strategies for riverine and water resources
- **Social issues**
 - Delegating responsibility to lowest level possible by enabling active participation
 - Raising awareness and building capacity amongst all stakeholders
 - Developing and sharing knowledge and technology with marginalised groups
 - Developing a culture of protection for water

These riverine and water resource trends and issues are consistent with those effecting other natural resources in the public domain, including forests, sea fisheries and extensive grazing lands (WRI, 1998). In response to these trends and the growing realisation that environmental degradation is caused by people and so requires a socio-economic solution (Blaikie & Brookfield, 1987), several researchers have developed methods to enable community participation in natural resource

management (Chambers, 1992a; Chambers 1994a; Dudley, 1993; Erade, 1997; Lincoln & Guba, 1985; Boal, 1995; Pretty & Frank, 2000). These are explored further in the literature review in Chapter 3.

1.2.2 Water resource management in South Africa

The global trends and key issues identified in Section 1.2.1 are all relevant to South Africa and have been largely recognised in the policy and regulatory frameworks affecting riverine and water resource management in the country (DWAF, 1997; DWAF, 1994).

Previous approaches in South Africa saw communities primarily as possible recipients of ‘top-down’ policies and programs relating to riverine and water resource management. Under the new National Water Act (Act No. 36 of 1998) (NWA) a new approach has been adopted in South Africa, which seeks to promote more active community participation for enhanced accountability and improved responsiveness to riverine and water resource management (Greyling, 1998; WISA, 2000).

The timing of the global commitment to riverine and water resource management paralleled the South African political transformations of 1994 as the post-apartheid government committed itself to readdressing the socio-economic, resource and political imbalances of the past (ANC, 1994b; Greyling, 1998; WISA, 2000). DWAF developed policies designed to have a positive effect on the poorest people of South Africa, particularly those who live in the rural areas (Greyling, 1998). The NWA states that an essential purpose of the Act is to redress the result of past racial discrimination, to promote the sustainable use of water in the public interest, and to facilitate social and economic development (Jaarsveld, 2001). South Africa’s political will to address and resolve inequities has been recognised and acclaimed as courageous and is characterised by its intent to honour people’s basic needs as well as the spiritual aspects of water (Calder, 1999).

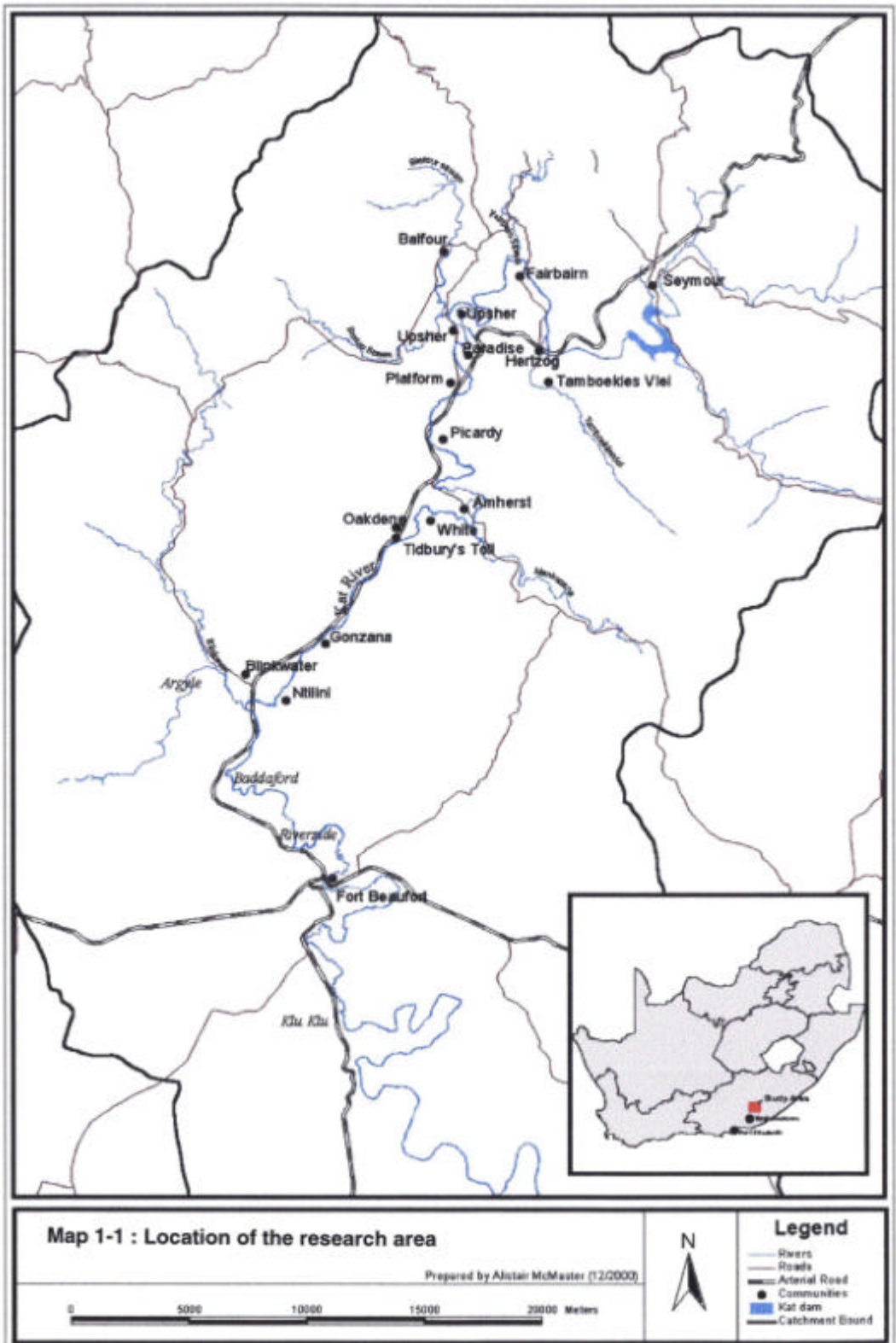
The Water Institute of Southern Africa (WISA) conference held in Pretoria (2000) considered IWRM as the philosophy, processes and “an implementation strategy to achieve equitable access to and sustainable use of water resources by all stakeholders at catchment, regional, national and international levels, while maintaining the characteristics and integrity of water resources at the catchment scale within agreed limits” (WISA, 2000, p. 3). Therefore, IWRM has moved away from a narrow focus on engineering to an understanding that people and the environment cannot be neatly separated nor one aspect ignored at the expense of the other. IWRM is concerned with current and

future generations, as it relates to the long-term sustainability of the water resource and the basic needs of people and ecosystems. It relies on the coordinated planning of water resources for efficient, equitable and sustainable use. IWRM has a strong social component that takes into account economic aspects and acknowledges participatory approaches, consultative processes, stakeholder knowledge and the need for good communication (Calder, 1999; WISA, 2000). The stronger the “convergence between ecological, economic and social requirements, the greater the likelihood of sustainable resource use” (WISA, 2000, p. viii). This thesis focuses on a new understanding of the interrelationships between marginalised people and the environment and explores it in a context of developing and adapting methods for enabling local people to become part of environmental care, specifically as it relates to water.

1.2.3 The geographical context

The research for this thesis was carried out in the Kat River Valley, in the Eastern Cape province of South Africa between 1996 and 2001. As shown in Map 1-1, the broader Kat River Valley is some 80 kilometres in length and some 1600km² in area, encompassing a wide range of water user groups (Motteux, 2001). The Kat River Valley catchment includes the urban municipalities of Seymour and Fort Beaufort and many smaller communities and villages. In addition, the catchment includes extensive, privately owned citrus estates, some of which have environmental management systems that have been certified to international standards (ISO14001). The research area includes many thousands of poverty-stricken, black community members who desire improved, regular domestic and agricultural water supplies.

Before the change of government in 1994, the research area was part of the Ciskei homeland – one of several black racial reserves created during the apartheid era, which were regarded as being nominally independent states.



Map 1-1 : Location of the research area

Many of South Africa's major rivers flow through former homeland areas. In these areas degradation of riparian zones are both a socio-economic concern and a widespread cause of perceived low ecological integrity. Rural areas in the former homelands are characterised by dense settlement and environmental stress. These areas lack electric and water supply infrastructure and are characterised by high levels of illiteracy, low human development indices and economic dependency on livestock grazed on communal lands and government transfers in the form of pensions. The communities in these areas are marginalised both politically and economically (Motteux & Rowntree, 1999a).

The main problems observed in these riverine and water resources can be summarised as follows:

- **an impaired riparian zone** due to the removal of riparian vegetation for fuel wood collection and grazing;
- **deteriorating water quality** due to the common presence of livestock in the water, in-stream bathing, laundry, run-off from pit latrines and degraded grazing lands;
- **high catchment sediment yields** in most catchment areas due to dirt roads and unsustainable land use practices lead to gully and sheet erosion; and
- **flow regulations** that are designed to meet the needs of upstream and downstream irrigators (Motteux & Rowntree, 1999a).

The political legacy of South Africa has also had a significant impact on riverine and water resource management in the former homeland areas. Apartheid served to strengthen divisions between the white, male, technocratic water resource manager and the black, often female and illiterate, traditional resource user (Rowntree, 1994). The apartheid era was characterised by a 'top-down' system of management, which encouraged the attitude that the DWAF "knows best" (Motteux & Rowntree, 1999a, p. 457) and gave the impression that black rural dwellers were not concerned with conservation or expected to become involved in the rehabilitation of their environment. Conservation has traditionally been seen as an elitist, western philosophy that strives for what is referred to as "single, universal and simplified explanations, strategies and schemes ... the grand theory, grand plan" (Janse Van Rensburg, 1995, p. 23).

A paradigm shift has since occurred in South African riverine and water resource management, from a purely technical approach towards the more participatory approach required by IWRM. In acknowledging this transformation the environmental experts, personnel from DWAF and other resource managers are asking the following questions:

- How do we engage disempowered, illiterate or semi-literate rural communities in riverine management when such communities have never officially been involved or encouraged to become active in environmental care before?
- How do we elicit and utilise local riverine and water resource management knowledge and give the rural people a voice (IAWQ, WISA & NPB, 1995)?

The research presented in this thesis set out to answer these questions.

1.2.4 The Social Context

There are increasing international and national calls for social transformation and involvement of local stakeholders in management with respect to the sustainability of riverine resources in response to the severity of ecological crises, both regionally and globally (DWAF & WRC, 1996). Significant recognition is now evident for the socially constructed nature of the environment, with socio-cultural, political and economic features being recognised as important aspects of the environment (Blaikie & Brookfield 1987; Fairhead & Leach, 1996; Janse Van Rensburg & Paxton, 1998; Sibanda, 1999). Instead of viewing the “environment as just ‘nature’ and natural systems, people are acknowledging that the environment is a human creation, a result of the way we use nature and its resources to satisfy our needs and wants” (Kirkby *et al.*, 1995, p. 3). This definition has led to an emphasis on “understanding the complexities of environmental issues, and on their roots in society’s structures and ways of thinking” (Janse Van Rensburg & Paxton, 1998, p. 2). Therefore, there has been an acknowledgment of the importance of socio-cultural, historical and economic forces in shaping the earth and communities as co-managers of the earth.

Within traditional communities, resource utilisation practices and knowledge have evolved and adapted in response to, and as a means of coping with, economic crises and hostile ecological conditions. This local knowledge is frequently ignored and suppressed by external change agents (Binns, 1995). In this thesis, discussion will focus on the need to search for appropriate solutions and strategies for sustainable resource management that recognises indigenous knowledge and the local situation (Sibanda, 1999) but which does not fall into the trap of the ‘noble savage’ (Rousseau, 1754; Nader, 2001). This latter philosophy contends that indigenous knowledge is intrinsically correct and should always be selected in preference to scientific knowledge learned through reductionist observation and experimentation. Rousseau (1754) held that indigenous communities were idealistically perfect and that western civilisation was harsh and evil by comparison. Almost 250 years later, it is necessary to avoid assuming that indigenous knowledge is always inherently

correct or present and acknowledge that it needs to be used appropriately if it exists. For example, people may have traditional rights to water or traditional ways of managing water resources that are no longer valid because of changes in flow regimes, water quality or land uses. Consequently, local knowledge needs to be seen as living and adaptive. In addition, it needs to be recognised that damaged or translocated communities, such as those in the research area of the former Ciskei homeland, have largely lost their local knowledge.

The 1994 political transition in South Africa has helped force a shift from a 'top-down' emphasis to a more people-centred approach. This has given rise to a demand for ways in which stakeholders can become part of riverine and water resource management. Marginalised communities do not have the same access to water resources or IWRM skills that 'white' South Africans have, therefore this thesis focuses on research approaches to redress the results of racial discrimination enforced by apartheid on people of colour. From the outset, the research aimed to work with marginalised people of colour and develop a partnership that recognised and worked within their social, cultural and economic contexts and knowledge base. This was perceived to be an effective way of meeting the objectives of this research.

1.2.5 The Institutional Context

The development and establishment of the National Water Act (NWA) influenced this research. Between 1996 to 1998, the NWA was in the process of being formulated by a team of specialists. During this period a task group was set up to research and review the concept and philosophy of IWRM. In the development of the NWA, both the policy makers and the researchers recognised the need to involve marginalised groups of people in riverine and water resource management. It was in 1998, two years after commencement of this research, that the NWA was completely drafted and subsequently enacted.

The purpose of the NWA is "to ensure that the nation's water resources are protected, used, developed, conserved, managed and controlled in ways which take into account amongst other factors, meeting of basic human needs, promoting equitable access to water; readdressing the results of past racial and gender discrimination; promoting the efficient, sustainable and beneficial use of water in the public interest" (National Water Act, Act No. 36 of 1998, Section 2). The NWA initiates regulation of water resources through the establishment of institutional structures (detailed below) to ensure community, racial and gender representation that enables the devolution of decisions and participation to local statutory institutions.

The NWA provides for establishment of statutory water management institutions at catchment, regional and local scales (National Water Act, Act No. 36 of 1998, Section 82. 5). These statutory water management institutions are vehicles for mobilising and implementing the purpose of the Act. They include statutory bodies such as Catchment Management Agencies (CMA) and Water User Associations (WUA). A CMA manages water resources within its Water Management Area (WMA). South Africa has been divided into 19 WMAs – large water basins demarcated for administrative reasons and comprising a number of contiguous river catchments. A CMA has responsibility for the strategic management of water resources including their ecology, engineering and distribution, allocation and sustainable use for a whole WMA. WUA on the other hand normally have a localised interest such as a specific irrigation area or dam command area (DWAF, 1999) and are mostly replacing Irrigation Boards that were established under previous legislation. In addition, the Act provides for non-statutory institutions such as a Catchment Fora (CF) that represent an important mechanism for broader community involvement in riverine and water resource management through using participatory and consultative approaches (Pegram, 2000). CF provide an opportunity for non-irrigators and others who do not use large quantities of water to participate in water resource management.

Participation is considered essential in ensuring that IWRM activities are implemented and marginalised groups are enabled to become part of this process (WISA, 2000). During 1999 and 2000 WUA and CF became the institutional focus of this research since they offered an opportunity for riverine and water resource stakeholders in the Kat River Valley to become formally involved with management activities prescribed under the NWA. The intent was to empower marginal and disadvantaged groups to enable them to participate in these institutions.

DWAF required the transformation of Irrigation Boards, established to manage irrigation infrastructure under the Water Act of 1956 (Act 54 of 1956), into WUA under the NWA. WUA normally operate at a local or regional level. They are required to be representative and inclusive of the water users within a catchment or sub catchment. The features of a WUA include:

- DWAF or water using stakeholders may initiate the process for WUA formation;
- WUA provide a mechanism that, with a CMA, can devolve the implementation of aspects of a catchment management strategy to the local level;
- management is delegated at the local level;
- functions allocated to a WUA are guided by local circumstances;

- a localised community should be enabled to pool their resources in order to carry out water-related activities;
- WUA may be concerned with a single purpose or may be multi-sectoral, dealing with a variety of water uses;
- the Minister may support initiatives, such as supporting emerging farmers in IWRM issues; and
- WUA are monitored by DWAF (DWAF, 1999; Khorommbi, pers. comm., 1999).

The purpose of a Catchment Forum (CF) “is to provide a platform to discuss water-related issues of common concern to people living in the catchments and seeking ways of addressing these. A CF is seen as an important requirement for the effective operation of CMA. The NWA does not refer specifically to CF, but indicates that voluntary grassroots structures are critical to the catchment management process. Such structures would provide channels for people to be actively involved in managing water resources” (Karar & Seetal, 1999, p. 1). It was against this background that in 2000, a specialist group was formed by DWAF to provide a coherent approach to bring about the establishment and management of CF (Pegram, 2000). The experiences gained during the implementation of this research contributed to that work.

1.3 Phasing the Research

Implementation of research activities to achieve the aims and objectives set out in Section 1.4 was undertaken in Three Phases, as set out in Table 1-1 and Figure 1-1 between 1996 and 2002. Phase One and Two focussed on the rural villages of Fairbairn and Hertzog which are situated in the Mpopfu district of the former Ciskei homeland (see Map 1-2).

Table 1-1 : The Three Research Phases from 1996 to 2000

	TIME				
PHASE	1996	1997	1998	1999	2000
Phase One					
Phase Two					
Phase Three					

In Phase Three, participants from Fairbairn and Hertzog communities acknowledged the need to operate at a broader catchment scale, resulting in a shift to include the broader Kat River catchment

area. It was in Phase Three that the communities of Fairbairn and Hertzog renamed the research project the Kat River Valley Project (KRVP). The project provided a platform for the Phase Three research. Lessons learned during implementation of the project informed the theoretical and methodological contributions resulting from this research. This thesis is not a write-up of the KRVP, but the KRVP provided the opportunity for the Kat River Valley people to benefit from the thesis research through the establishment of the CF and WUA. The KRVP was initially seen as an extension beyond the research presented in this thesis, but in fact became the phase in which the thesis research came to maturity.

The sources of funding changed during the life of the research. Phase One and Phase Two were funded by student bursaries from the National Research Fund and the South African Water Research Commission (WRC) and were managed as a small-scale student research investigation. Phase Three was funded as a research contract with the WRC.

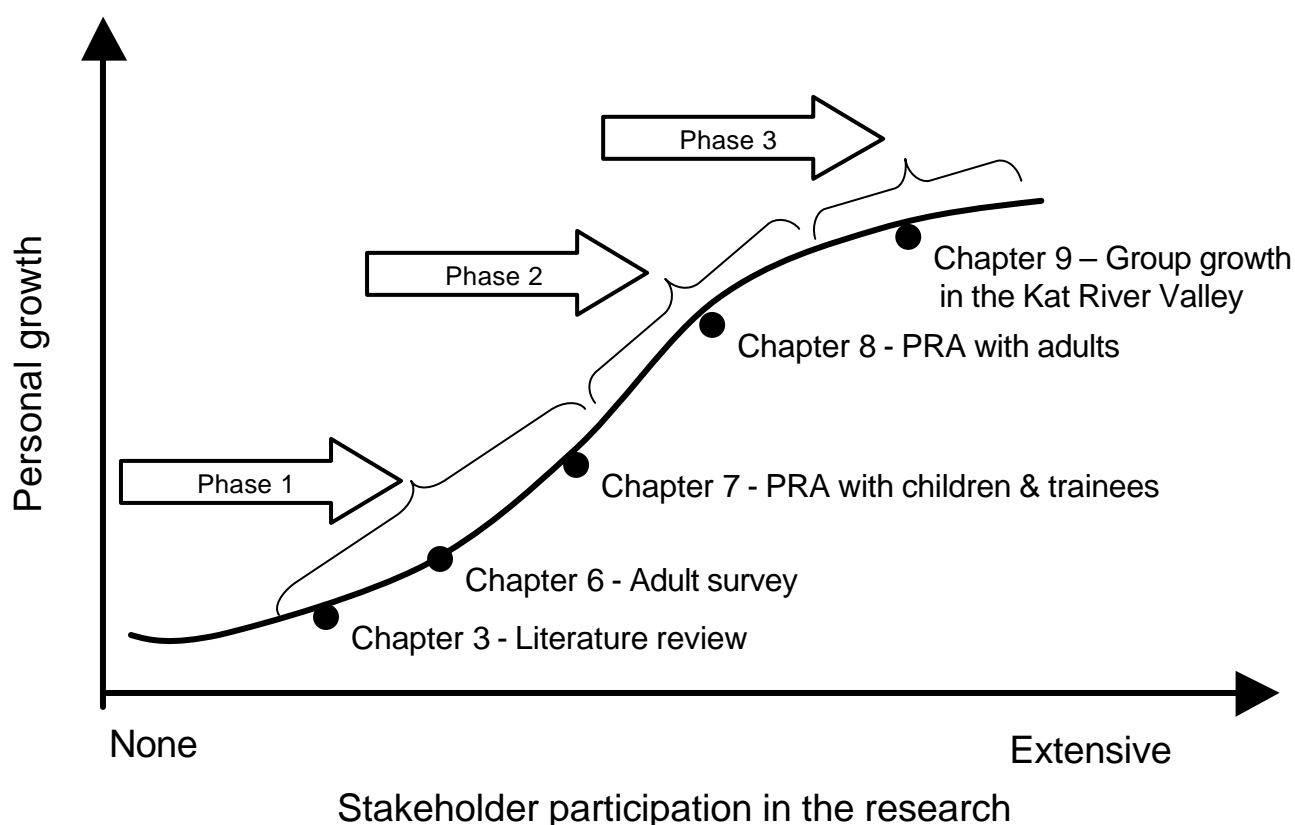
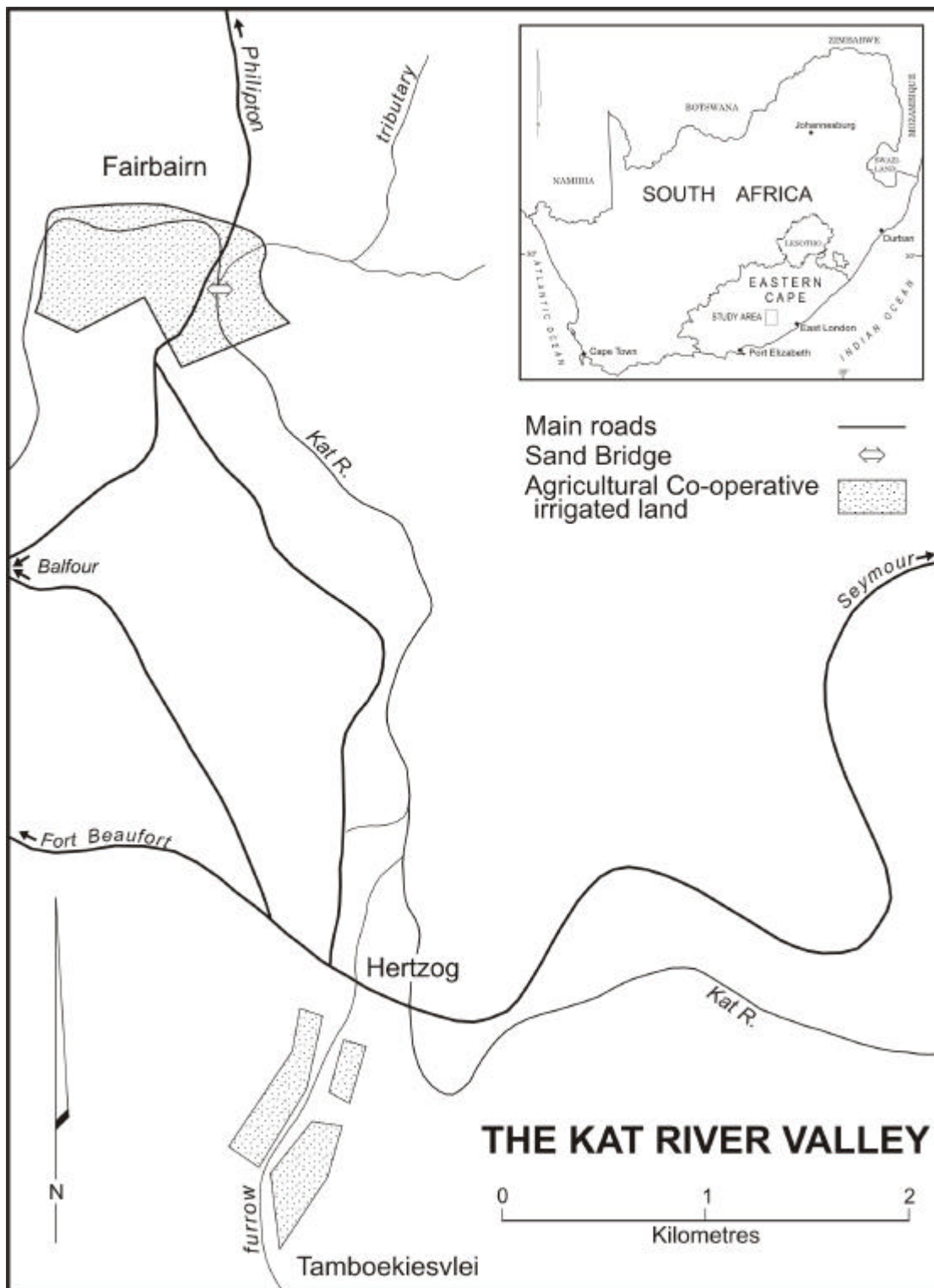


Figure 1-1 : Schematic Representation of Phased Evolution of the Research

The activities of the research included: understanding the relationship between participants and the environment; raising environmental awareness; mobilising people and building their capacity to

manage their own riverine and water resources. As shown schematically in Figure 1-1 the research evolved over time. This emphasises that it was a research process characterised by learning-by-doing and discovery. The thesis is presented chronologically to capture the essence of the learning as it evolved. This thesis is essentially a personal account of the rich experience of working in and with communities on water-related issues in a particular rural area. The thesis also seeks to reflect the dramatic shifts taking place in South Africa as well as the admission that the IWRM journey is a complex one in which the destination or final outcome is not always known. Further, this research was rooted in the quest to implement participatory methods. In this, it was crucial that I constantly reflected on my work and methods, in order to ensure a healthy self-critical mode promoting accountability.



source: Modified from Nel, 1998.

Map 1-2 : Location and Context of Fairbairn and Hertzog

1.4 Aims and Objectives of the Research

This section details the aims and objectives of the research and comments on the fundamental changes in the approach to the work. The process sought to enable the research to embrace errors, learn, try, share, adapt and be brave enough to change or pursue a particular direction. This research journey was one of co-learning with village participants, led by the core vision of enabling and understanding how to assist marginalised people in becoming part of riverine and water resource management.

1.4.1 Evolution of the Research Aims and Objectives

Consistent with the phasing of the research and the evolving nature of the institutional and social environments in which the research was implemented, the aims and objectives of the research also evolved over time. The aims of the research and the objectives were in fact achieved, but the path taken to achieve this changed with each phase and unexpected lessons were learned and additional outcomes were achieved through the course of the work. The research started with a focus on riverine management, and evolved towards integrated water resource management (IWRM) at a catchment scale.

1.4.2 Research Aims in the Original Proposal

In the original proposal, the aims of the research were identified as follows:

The aim of this research is to analyse and understand how the particular rural community's structures, local knowledge, attitudes and needs effect the riparian zone. The community study will be assessed against a baseline provided by a scientific study. It will assess the degree of degradation, or ecological integrity, in a selected river system in the Eastern Cape. The research will examine the potential for its management conservation through the development of appropriate research methodologies. The blend of community-driven methods and the integration of scientific approaches will aim at facilitating the community knowledge and scientific knowledge to have an applied development outcome. The research will endeavour to make a theoretical contribution to broader development principles, practices and future research that takes cognition of local knowledge, perceptions, community socio-economic cultural structures and the physical environment.

1.4.3 The Research Aims as they Evolved

The research aims cited above have a strong focus on comparing and contrasting scientific and local knowledge in order to develop a platform on which water resource managers could work with rural people. In order to realise this aim, both rural communities and water resource managers needed empowerment to ensure matching capacity for participation in the processes of IWRM negotiations and discussions. This was achieved by using a range of philosophies and associated methods, including PRA, Theatre for Development and Action Research, as detailed in Chapters Four and Five.

As the research evolved, the approach shifted from a focus in Phase One on the identification of peoples' local knowledge with the intention of informing policy, to a focus in Phase Two on the rural people collectively sharing and analysing their environmental knowledge. The shift in approach between Phase One and Phase Two resulted from the realisation that local knowledge for riverine and water resource management was limited as a result of recent history and that activities designed to enable active participation were required if the research aims were to be realised. This reasoning was re-emphasised in Phase Three when the approach evolved further to focussed on capacity building. This was intended to enable participants to enter into a range of situations with stable abilities and self-confidence, allowing them to actively engage in seeking agreements and solutions.

The unfolding approaches to achieving the aims of the research through the different research phases can be summarised as follows:

- Phase One: To understand rural people's relationship with their riverine environment and to identify local knowledge of water resource management.
- Phase Two: To encourage local people, through the development of a catchment forum, to recognise their local knowledge and encourage behavioural change.
- Phase Three: To build the capacity of stakeholders to participate in the management of the Kat River Valley catchment through the development of a WUA and a CF.

1.4.4 Implementation of Research to Achieve the Aims – 1996 to 2001

While the aims themselves did not change over the six-year research process, the methods of achieving them did. This evolution is supported by the theses of Lotz (1996) and Burt (1999). In the initial proposal, the aims and objectives were drawn up without reference to the views of grassroots inhabitants or potential participants, but did incorporate the perceptions and views of leaders who

represented the communities and the Hertzog Agricultural Cooperative (HACOP)². These leaders organised a meeting for the community in Hertzog village during 1996, at which the research proposal was presented and outlined. Participants in this meeting recommended that the Principal of the Hertzog Primary School be contacted in order to discuss with him the relevant aspects of the research and seek his permission to work with the school children for a period of two weeks. As Chambers (1992a) points out, this consultation process mirrored that followed by many researchers, and recognised that while most research is initiated from the outside, the need exists that the research design become emergent and reciprocal to people's needs. "The topic may be determined, or at least suggested by the outsider, but the role is not to extract through questions but to initiate a process of presentations and analysis" (Chambers, 1992a, p. 42).

Implementation of research activities began with an evaluation of people-environment relationships in two rural communities within the Kat River Valley. This was intended to allow for the development of appropriate research methodologies in order to enable local participation in sustainable management of riverine resources. During the review of local peoples' relationship to the environment it became apparent that there was a need for capacity-building as many of the participants did not have confidence in their own environmental knowledge. Reflection on this particular finding made it clear that an adaptation in the research plan was necessary, and that the activities used to achieve the research aims needed to be flexible and open in order to be able to incorporate the needs of the local people.

1.4.5 Research Objectives

The objectives of this thesis are presented below:

a. Scientific data collection

To undertake an ecological and habitat integrity assessment of the Kat River (Hertzog and Fairbairn) in the Eastern Cape, South Africa. The study will include the criterion identified by Kleynhans (1995): water abstraction, flow modification, inundation, bed changes, channel changes, river bank conditions, water quality, aquatic fauna, waste disposal, vegetation removal, vegetation encroachment, and macrophyte condition.

² In August 1994, Hertzog and Fairbairn people chose to work together and establish a farming co-operative, namely the Hertzog Agricultural Co-operative (HACOP). HACOP was established as a Section 21 company with cabbages, potatoes and butternut being the main agricultural products. See Chapter 2 for more information on HACOP.

- b. To utilise community sensitive, people-centred methodologies that will lead to the empowerment of the community and allow for applied outcomes**
- c. To ensure the adaptation of participatory research techniques (PRA) to the South African context**
- d. Assessing the adults' and youths' riverine values and perceptions**
 - To analyse and understand how the adults' and the youths' local knowledge, attitudes, needs and community structures affect the riparian zone within their local and surrounding environment.
 - To determine the degree to which the adults and youth are concerned to look after or even to improve the state of the river for their immediate use and for the use of future generations.
 - To compare the adults' and youths' local knowledge with 'western' scientific knowledge.
 - To establish the adults' and youths' understanding of water law and their attitude towards water regulation.
 - To enable the adults and youths to critically review and evaluate their actions and effects on the environment.
- e. To Assess the Hertzog Primary School children's values, perceptions, solutions of the community, river and the surrounding area**
 - To undertake on-the-job training of volunteer community members in the principles of participatory learning and action in order to carry out participatory research in the school.
 - To utilise games and exercises for the introductions, icebreakers, to improve listening and to encourage team work in a relaxed atmosphere.
 - To understand the role of children within the broader community structures.
 - To determine and understand the level of childrens' understanding of water users and sources.
 - To analyse and understand how the school children's local knowledge, attitudes and needs affect the riparian zone within their local and surrounding environment.
 - To determine the degree to which children are concerned to look after or even to improve the state of the river for their immediate use and for the use of future generations.
 - To compare the children's local knowledge with 'western' scientific knowledge.

- f. To encourage and facilitate problem-solving processes and catalyse development through community-sensitive approaches**
 - To establish which aspects of river management the community want to solve and how.
 - To provide the necessary structures and information to enable the community to achieve development.
- g. To make a theoretical contribution to broader development principles and practices that takes cognisance of local knowledge, perceptions, community socio-economic, cultural structures and the physical environment**
 - To utilise local knowledge in order to recommend appropriate conservation methods and provide guidelines as to how to approach community river management research in the future.

1.4.6 Implementation of Research to Achieve the Objectives– 1996 to 2001

Within process-orientated research, research activities to achieve objectives need to evolve in response to local needs. Throughout the implementation of research activities for this thesis it was necessary to be able to change and be open to adapting or strengthening them to ensure the research could meet the diverse needs of the rural people involved as well as the planned aims and objectives.

In addition, capacity-building for riverine and water resource management is not only about the health of the river, but also about the collective and individual health of the communities – physically, mentally, their confidence levels and level of self-esteem, past experiences, fears, strengths and opportunities. Therefore, it was necessary to ensure that research activities overlapped with the needs of participating stakeholders. Below, I review some of the adaptations to the approaches used to achieve the research objectives.

The ecological and habitat integrity assessment

It became apparent that it was an ambitious undertaking to assess the ecological and habitat integrity. There were no developed or recognised sets of methods for evaluating river health within the research period (such methods were, at that stage, still being designed and tested by ecologists in South Africa). This issue was raised by Steedman (1994) who noted that “one result is that the concept of ecosystem health is not yet associated with a set of methods that leads in an acceptably direct way to practical results” (p. 605). In South Africa, these methods, procedures and tools were being developed to support implementation of the NWA by WRC financed research and DWAF programs at the start of the research period and were nearing completion in 1999. Their findings

were translated into 'implementation' manuals (DWAF, WRC, DEAT, 1999) which are being trialled in specific South African catchments between 2000 and 2003. In 2002 there remains significant debate in South Africa about the validity and methods of practical application of methods for ecological and habitat integrity assessment.

Further, I was neither competently trained nor sufficiently advised in this field of study since my background is in anthropology and human geography. These technical and personal limitations required that the approach to the objectives be modified as follows:

- To provide general bio-physical information of the status of the river presented in the Study Area Chapter (see Chapter 2).
- To provide foundation knowledge that could inform the process of helping local people to engage in riverine and water resource management and allow researchers to understand the context for such activities.

Given the absence of accepted guidelines, the lack of relevant skills and advice, and the high cost of employing scientists to support these activities, the integrity assessment objective of the research was kept to a minimum base-line study. This was deemed to be desirable as the research aims were not dependent on scientific interpretation of the environment but were rather concerned with peoples' relationship with the environment. The base-line information was, however, beneficial to developing an understanding of human impacts on the environment and possible environmentally sensitive areas. It also helped provide an understanding of the key environmental considerations in the study area, which helped focus activities in the research.

In Phases Two and Three it was realised, through reflection, that any exchange of ideas between scientific and local communities required both groups to have the capacity and the confidence necessary to work together and build a partnership. This notion of partnership- building between water resource scientists and formerly disadvantaged communities is central to IWRM. The research focus on building capacity laid the basis upon which the rural communities could directly participate in Reserve Determination research funded by the WRC.

To utilise community sensitive, people-centred methodologies that will lead to the empowerment of the community and allow for applied outcomes

The objective of working within a participatory approach became of central importance. Reflection on the outputs of each research activity became a tool to examine the effectiveness of each activity

and identify obstacles and possible solutions. To fulfil the objective of finding ways to encourage local people to become part of the research it was necessary to be accountable for actions, conscious of research assumptions, and open with successes and failures.

To ensure the adaptation of participatory research appraisal techniques (PRA) to the South African context

To bring a meaningful and effective contribution to the practice of riverine and water resource management, as required by the NWA (DWAF & WRC, 1996), it was necessary to examine one's experience as a researcher. It also necessitated regular communication of my experience to water research managers through seminars, steering committee meetings and regular telecommunications with decision-makers in DWAF and WRC. This also ensured that the research activities were informed by up-to-date developments in South Africa relevant to IWRM and that the relevant information could be fed back to the participating communities.

In addition, as there is a lack of capacity and skills in participatory methods locally, undergraduate and postgraduate students were encouraged and advised, and practitioners and researchers both within and outside the university were communicated with to understand and build confidence in participatory research. Sharing, teaching, advising and learning from others was integral to the adaptation of methods to the South African context and was an important aspect of the research experience.

To assess the adults' and youths' riverine values and perceptions

In Phase One of the research, the administration of a structured interview in the villages of Fairbairn and Hertzog was the primary instrument of collecting and assessing the adults' riverine knowledge and perceptions (see Chapter 6). The essence of undertaking this inquiry was to find locally driven conservation practices, explore environmental local knowledge, and to establish local peoples' use and dependency on natural resources. The inquiry revealed, however, that the local people believed that they lacked both the confidence and knowledge necessary to being active in bringing about rehabilitation measures.

In Phase Two the approach to achieving the research objectives evolved in response to the participants' self-proclaimed need to build their confidence in accessing their own riverine knowledge. Achieving the research objectives during Phase Two required establishment of informal institutions to enable local people to come together and to take an active part in investigating their

riverine values and perceptions through a process involving group negotiation, co-learning and reflection. This objective was framed on the assumption that the process needed to be one that unfolded and acknowledged research uncertainties, advocated flexibility, continuous learning and adaptation and thus ensured that rural communities' needs were incorporated.

The approach to achieving the research objectives during Phase Three was to employ methods learnt in Phase Two in order to build the capacity of local people at a catchment scale. This objective led a process through which participating stakeholders could assess their environmental knowledge and skills themselves. This would then allow participants to own their knowledge and skills and feel they were able to enter into riverine and water resource management processes. This objective resulted in recording and observing the themes that informed the methods which sought to enable people to have confidence in people-environment issues.

To assess the Hertzog Primary School children's values, perceptions, and solutions relating to the community, river and the surrounding area

Research in the latter part of Phase One with the Hertzog Primary School children (see Chapter 7) was driven by the need to experiment with new, interactive methods and to break away from the use of traditional, anthropological methods of observing, surveying and discussion which had failed with the adult survey (see Chapter 6). The objective was to understand the school children's relationship to the environment through the use of visual and interactive approaches, as outlined by Pretty *et al.* (1995).

To encourage and facilitate problem-solving processes and catalyse development through community-sensitive approaches

The objective concerned with facilitating problem-solving processes to enable development was an important focus of the research. The approaches adopted needed to enable participating stakeholders to identify their needs and become the instruments of change themselves. To achieve this objective participatory methods that drew on PRA, action research and theatre for development were used. This caused a shift from the researcher's role as a passive collector of information to that of one of deliberately seeking and enabling positive change, as seen in Phases Two and Three.

In addition, the marginalised groups came to the IWRM process with no voice, little formal knowledge and very low self-esteem. In Phase Two and Phase Three, it was important that the methods enabled participants to build confidence in themselves and their knowledge, to face and

deal with conflict, take on responsibility, celebrate success and learn from failures, and create strategies. It was further important that the methods engendered the ability to deal with change while growing trust and respect.

To make a theoretical contribution to broader development principles and practices that takes cognisance of local knowledge, perceptions, community socio-economic, cultural structures and the physical environment

The researcher was not excluded from this process in which opportunities for learning and growth abounded. In this, the researcher's role was less focussed on collecting data and more concerned with identifying and exploring practical applications of participatory theory that took account of local knowledge, perceptions, socio-economic contexts, cultural structures and physical environment.

1.5 Research Design

The research design "guides the investigator in the process of collecting, analysing, and interpreting observations" (Nachmias & Nachmias, 1987, p. 103). At the start of the research, plans were driven from outside the village, which resulted in the local people not owning any aspect of the process, from representation to management to action plans. In this context it was initially the researcher that was the principal driver of the research design.

This research made use primarily of Participatory Rural Appraisal (PRA) philosophy and methods - a participatory research approach articulated by Robert Chambers and Gordon Conway in the 1980s and 1990s (Chambers, 1994a). Like Chambers and Conway, the research was influenced by the seminal work of Paolo Freire (Freire, 1972). In addition, the use of innovative methods for engagement of the oppressed using theatre developed by Augusto Boal (Boal, 1995; Boal, 1992) were explored to add value to PRA. Finally, I also used action research concepts (Kemmis, 1995) to ensure that community participants were actively involved in the research being conducted for this thesis. In all of this, the participatory research used less quantitative and more qualitative methods such as community workshops, semi-structured interviews and transect walks (Dudley, 1993).

As the work progressed, a participatory approach was more actively adopted. This resulted in the research design becoming increasingly open and reciprocal as the local people and the researcher guided and informed the design. The design was increasingly based on an approach that was adaptable, open, innovative and responsive to different situations as well as to the needs of the local

people and the research. This enabled the design to be owned by both the local people and myself, the researcher. The design was based on negotiation, mutual understanding of what needed to be done and who should do it, over what time period. Lather (1986) encourages researchers to “to experiment with the new designs” (Lather, 1986, p. 272) and to be open about the research process.

Adaptation and flexibility were not applied randomly. Rather, they resulted from a constant reflection on outputs from research activities, methods used, texts and also the needs of DWAF and other research participants. The use of reflection or self-evaluation is also aligned to the practice of action research which uses questions such as “How do I improve what I am doing?” (McNiff *et al.*, 1996, p. 11) to improve the researcher by “understanding events, situations and problems so as to increase the effectiveness of their practice” (McKernan, 1991, p. 4) (see Chapter Four for further discussion on AR).

In undertaking the research, it was necessary to have a clear vision of the research aims, and be capable of translating them into appropriate and consistent action. Constant clarification of the aims helped those involved to, firstly, achieve the aims and, secondly, recognise when they have been attained. In this process of reflection and evaluation Fowler (1997) suggests that three stages are essential:

- confirmation of what the research stands for in terms of coherence between its aims, objectives, identity and role in society;
- linking these to longer-term strategic choices which give the research overall direction and maximise its impact on society; and
- the translation of choices into tangible actions and tasks to be carried out by staff, volunteers and others in collaboration and with some stakeholders (Fowler, 1997).

Planning for short-term actions within the broader research design was understood as the art of selecting the step-by-step direction in which the research should go, as well as choosing which activities would best ensure that the research aims and objectives were efficiently and effectively achieved. Within this, planning needed to be tailored to the specific circumstances of each activity and that, in shaping the activity, input is gained from the stakeholders.

1.6 Map of the Thesis

The format of this thesis is influenced by the research journey. This research was embedded in rich experiences that were practical and technically informed as well as emotional. Although this research was initiated as a PhD study, the research activities ended up involving many other people because of their participatory focus. Accordingly, the format of this text and its audience has required careful consideration. Through reflecting on the data, the need for the thesis to be accessible to stakeholders outside academia became apparent – including practitioners, government staff and community leaders interested in riverine and water resource management. The conventional structure of the thesis needed to be adapted to fulfil a broader purpose - so that the thesis could inform with broad range of stakeholders who have ownership of the research activities reported in it.

To achieve these broader aims, the thesis is presented in ten chapters. Chapters One through Five offer the reader the information necessary to engage and share in the research journey: a description of the study area, a literature review, an exploration of philosophy and a review of methods.

Chapters Six to Nine describe the research phases conducted between 1996 and 2001. Chapter Six presents methods, results and conclusions from survey work conducted in selected villages. Chapters Seven to Nine describe and analyse the overall processes used during the evolution from early trials of PRA with children and trainees, through use of PRA with adults to group growth in the Kat River Valley. In these three chapters, the research is presented as a process in which methods used and results are achieved in iterative fashion with reflection or self-evaluation continually used to review and refine the research approach.

Chapter Ten presents the achievement of aims and objectives through key reflections and lessons learned as well as presenting the theoretical and methodological contributions from the research. The reflections and lessons from the research include a suite of methods found to be effective in enabling participants to actively participate in the management of riverine and water resources.

It is important to appreciate that the chapters cannot be seen as separate, stand-alone units: the boundaries between them are often blurred and overlap. This is due to the nature of presenting a six-year journey full of changes, discussions, thoughts, hopes, breakthroughs, backtracking, ideas, needs, successes, and struggles in a manner that accurately portrayed the essence and spirit of the work. A brief summary of each chapter follows:

1.6.1 Chapter One : Introduction

This chapter provides a brief introduction to global trends and international issues in riverine and water resource management. It then links these with South African riverine and water resource management issues and presents the changing political and institutional context for the research. It discusses reasons why socio-cultural concerns should be regarded as central to a rehabilitation initiative. It acknowledges that marginalised groups possess their own unique experience and knowledge that is, however, often disregarded or dismissed in conservation debates. It introduces the research, provides a background to the study area, details the aims and objectives, discusses the concept of research orientations, the issue of confidentiality and the tone and manner of the text you hold in your hands.

1.6.2 Chapter Two : Setting the Context of the Study Area

This chapter provides a socio-historical, political, economic and environmental account of the Kat River catchment in the Eastern Cape. The study was initially implemented in two rural communities, Fairbairn and Hertzog, from 1996 to 1998. From 1999 to 2001 the research expanded to sub-catchment scale to include the inhabitants of the mid to lower reaches of the Kat River catchment.

1.6.3 Chapter Three : Literature Review

Chapter Three reviews published literature to explore key thinking and current debates surrounding public participation in riverine and water resource management. It explores the influence that the ecological paradigm and development orientation have on human and environmental relationships over time. There is a particular focus on the effects of development programs and research work conducted under various orientations and ecological paradigms on marginalised groups, as detailed in established literature. This chapter seeks to demonstrate that there is currently a shift away from 'dominant' development thinking, practice and solutions towards a position that takes into account different cultures and local conditions – called the participatory orientation in this thesis. The participatory orientation works towards ensuring that development will bring change that is wanted and meets the needs of the people. This chapter also traces the changes in South Africa's resource management systems towards systems that are concerned with the empowerment of people who were previously marginalised.

1.6.4 Chapter Four : Philosophy

Chapter Four discusses the research orientation as the philosophical framework that guides research activity – it is the “basic set of beliefs that guides action” (Guba, 1990, p. 17).

After examining dominant and participatory orientations, the chapter discusses guiding philosophies used with a participatory orientation and how orientation shaped the evolution of the research. The chapter also reflects on evolution of the research.

This chapter emphasises the importance of being aware of the philosophical framework that guides the research and of being conscious that beliefs influence and frame the research, how one goes about doing the research, and how one interprets the results.

1.6.5 Chapter Five : Methods

In Chapter Five, introduces and explores methods that were used in this research, including traditional scientific research methods, participatory methods, Participatory Rural Appraisal (PRA), Theatre for Development and Action Research. The discussion also reviews the importance of planning and teamwork in order to achieve efficient and effective research outcomes.

1.6.6 Chapter Six : Phase One - Adult Survey

Chapter Six presents and discusses Phase One of the research journey, which began in 1996 with the administration of household surveys in the Fairbairn and Hertzog communities. The survey was designed to identify participants past and present relationships with their community and riverine environment. The findings of the survey provided a picture of how participants from Fairbairn and Hertzog used riverine and water resources and their perceptions of their environment. The survey process and results also identified that poor communication amongst villagers and their lack of financial, educational and management resources resulted in their withdrawal from riverine management. The interview process did not, however, encourage respondents to take an interest and participate in the research. Thus, I became aware that a change of approach was necessary to ensure full participation in the process of riverine management.

1.6.7 Chapter Seven : Phase One - PRA with Children and Trainees

Chapter Seven builds on the lessons learned from administering the survey and discusses how they informed and encouraged exploration of participatory methods to enable the school children from

Hertzog Primary School to become co-learners in the research for participatory riverine and water resource management. This chapter gives an account of the shift in the research towards Participatory Rural Appraisal (PRA) methods with sixteen children and three Hertzog youth.

As the research sought to understand the children's relationship with their environment and gain an understanding of the methods and guiding philosophy of PRA, the importance of being open to experimentation and innovation was learned. This chapter marks an essential shift towards the practice of reflexivity. It presents a step-by-step analysis of work undertaken with the children and the trainees. This analysis examines the errors, break throughs, deadlocks, threats and opportunities that occurred during this time.

1.6.8 Chapter Eight : Phase Two - PRA with Adults

This chapter explores how the learning and the insights gained from implementing PRA with the Hertzog school children encouraged further exploration of participatory philosophies and methods with the adults in the communities. In 1997 a series of feedback workshops took place in which participants acknowledged the constraints of the quantity and quality of the Kat River water. At these feedback workshops participants decided to participate in a two-day environmental workshop. The logistics of this event were shared with the villagers. The environmental workshop used participatory methods that encouraged participants to collectively explore their local environment and their relationship with it. The participatory methods enabled a lively, stimulating, awareness-raising forum. The village people committed themselves to gaining a deeper understanding of their environment and their lives.

Chapter Eight presents Phase 2 of the research, which marks a change in my role from that of being a researcher to that of a co-learner and facilitator. Chapter Eight marks the shift from a dominant research orientation towards the participatory principles embodied in the NWA which was being developed in parallel to this work. This Act highlights the importance of promoting villagers having a say in their own water resource management (DWAF & WRC, 1996).

1.6.9 Chapter Nine : Phase Three – Group Growth in the Kat River Valley

Chapter Nine presents Phase Three of the research, in which the Kat River Valley Project (KRVP) provided a platform that allowed the PhD research to be extended to the broader catchment. Here

local Kat River Valley stakeholders, including Fairbairn and Hertzog people, could benefit by developing IWRM institutional structures. At a Kat River Valley Stakeholders Workshop in 1999, participants elected to form a WUA and CF. These IWRM structures were developed to enable diverse socio-economic and racial groups to take a positive role in the management of their catchment. As I was the project coordinator of the KRVP it gave me the opportunity to use this project to explore further and learn more about the tools, programs and processes necessary for engaging local stakeholders in participation of their riverine management. This chapter does not document in detail the many activities that took place in order to achieve the formation of a WUA and CF. Rather, I describe and reflect on the approaches used to build the necessary capacity in, and empowerment of, marginalised groups to enable them to participate in the formation of these institutions.

1.6.10 Chapter Ten : Reflections and Lessons Learnt

Chapter Ten reflects on the six-year research journey and presents lessons learned and the theoretical and methodological contributions of the research. It highlights key lessons concerned with the identification and exploration of practical applications of participatory theory for IWRM. These practical contributions are in line with the aims and objectives of the research and meet the needs expressed by DWAF and WRC (1996) who acknowledged the paucity of practical knowledge in applying participatory principles to IWRM in South Africa. It is hoped that this research has resulted in a participatory approach that is suited to empowering formerly disadvantaged rural communities in South Africa to move towards active participation in IWRM. Some of the lessons learned from this research have already been used by other practitioners and have been used in the preparation of guidelines for participatory IWRM in South Africa (WRC, in press).

1.7 Being Open with my Orientation

The research orientation is the philosophical framework that guides research activity – it is the “basic set of beliefs that guides action” (Guba, 1990, p. 17). It is within an orientation that a research question is framed, objectives are selected and particular methods of data-collection and methods of analysis are applied. Orientations also influence the manner in which resource management is understood and undertaken by “telling the practitioner what to do” (Patton, 1990, p. 37). Orientations are fundamental in creating sets of assumptions, methods and modes of explanation that a community of scholars agree to follow (Griggs, 2000). There is an increased awareness by

researchers of the significant influence that assumptions underlying various paradigms bring to bear on the research process: how they determine the roles, goals and even outcomes in environmental management (Fien, 1993; Fien & Hillcoat, 1996).

This thesis explores two development orientations: the dominant and participatory orientations. The dominant and participatory research orientations are based upon very different sets of assumptions concerning theories, methods and procedures (Lincoln & Guba, 1985; Carr & Kemmis, 1986; Fien & Hillcoat, 1996; Kuiper, 1997). Each orientation has a particular conceptual framework for understanding the social world which guides and influences research activity.

The dominant orientation is rooted in positivism. Hesse (1980) cites the three most important assumptions underlying positivism to be “naive realism, belief in a universal scientific language, and a corresponding theory of truth” (in Lincoln & Guba, 1985, p. 24). Stocking (1987) proffers the following critique of positivist assumptions in *Land Degradation and Society*:

It would be good to believe that science is fact and that measurement is right. Indeed, so tempting is the thought of the neutrality of science (and the objectivity of measurement) that many who should know better – scientists for example – believe it, and those not in a position to judge believe it too. The white-coat syndrome is a powerful force, and nowhere is this truer than in the presentation of results of experiments and programs of measurement. Measurement, however, is not an isolated process. First, somebody has to decide to do the measurement; set a working hypothesis for the measurement to test; choose a set of methods; arrange a sampling program and people to do the sampling; analyse the result and use judgement in the interpretation of these results; and decide how those results should be presented and to whom. Then there is the recipient of the measurement who puts the data into context (or rejects them entirely) and who has to make value judgements as to the worth and applicability of the information. Finally, there is the end-user of the measurement; the person who makes the decisions, who bases a course of action on the results so presented. All these people have their preconceptions, misconceptions and ideologies. Therefore, measurement is never neutral, never a pure service for science or policy (Stocking, 1987, p. 49).

A participatory orientation promotes the production of collective analyses and thus collective knowledge. Here knowledge is assumed to be embedded within a range of contexts – socio-economic, historical, political and environmental. Since the idea of ‘one truth’ is rejected, a participatory orientation seeks to elicit knowledge by assisting participants to reach an inherent understanding of their strengths, problems, abilities and resources. The aim of this process is to enable positive action. The methods are flexible and rest on continual reflection and evaluation. The researcher is not excluded from this process and is therefore accountable to the participants (Jackson & Van Vlaederen, 1994). Two approaches that share a participatory orientation are: Participatory Rural Appraisal (PRA) (Chambers, 1992a, 1992b, 1994a, 1994b, 1994c); and Action Research (Kemmis, 1995).

I follow Flew’s (1979) definition of the participatory orientation as a school of thought which stands “against confidence in objective or scientific truths” (p. 294). Lather (1986) outlines four basic assumptions of the dominant orientation (Lather, 1986, p. 260):

- the aims, concepts, and methods of the natural sciences are applicable to the social sciences;
- the correspondence theory of truth which holds that reality is knowable through correct measurement methods;
- the goal of social research is to discover universal laws of human behaviour which transcend culture and history; and
- the fact-value dichotomy, the denial of both the theory-laden dimensions of observation and the value-laden dimensions of theory.

Lincoln & Guba (1985) have drawn attention to the relationship between orientations and methods in research. They advocate that there is often a temptation amongst researchers to view orientations as a collection of methods which ignores their ontological and epistemological differences, the connection between nature with reality, and the construction of knowledge. In their definition, philosophies are understood as an all-embracing influential guide for undertaking the research, while methods are the tools used. Thus it is of less concern whether methods are associated with a particular orientation, but rather how those methods are used (Lincoln & Guba, 1989 in Dison, 1998).

It was necessary for me to recognise the impact that my shift in orientation had on my research journey. In Chapter Four, I provide an in-depth account as a ‘traveller’ by sharing the changes in orientation within the Three Phases of my study. Below, I list the assumptions that occurred within the research:

Phase One: I was influenced by anthropological assumptions that drew on the implicit belief that the researcher’s needs were central to the research.

Phase Two: I straddled two schools of thought, dominant and participatory (RRA and PRA) – evolving from the dominant to the participatory through this Phase.

Phase Three: I worked with participatory assumptions that drew on PRA and Action Research.

1.8 My Personal Journey: the use of ‘I’ in the Thesis

The format of conventional research texts that use the third person offer, in my view, a more protected place from which to speak. “This impersonal view removes the writer and the reader” from the richness of the research experience and all the lessons learned (Creswell, 1994, p. 43). The use of the third person can be a means in which to claim or justify the writer’s authority. Some might say using the first person can be a means of privileging an individual point of view. While I acknowledge the possible dangers of such privilege, I also hold that since everyone’s experience is unique and may be valuable, mine is no less so. In this, I recognise that there is not one, single truth and that each person that participated in the research activities described in these pages also has their own story. This thesis is my version of the story, designed to address the aims and objectives of the research as well as to share my personal experiences and lessons learned.

In addition, the research required me to be self-reflective and acknowledge that I was working from myself. A similar stance is taken by Ely *et al.* (1991, p.112) who describe the inescapable consequences of our personal involvement in the research:

We are the primary instruments, but we are not cool, automated instruments. As human beings with warmth and feeling, our pulses resonate with the heartbeat of our research participants. While we try to maintain distance and perspective, we, too, have personal responses to what we see and hear. We must accept the emotional aspect as part of and parcel of the method (Ely *et al.*, 1991, p.112).

The position of researcher is powerful and it is through entering into the research process that the researcher can acknowledge their own power (Lotz, 1996; Lotz & Burt, 2001). Within the

participatory orientation it is acknowledged that attempts to deny one's position of power as a researcher are nonsensical and counter-productive. For example, a researcher often has markedly better opportunities for accessing information, lobbying for development, as well as access to tools such as telephones, the Internet, computers and transport. Admitting to the 'I' enables the researcher to step off the pedestal and become a co-learner with other participants. It is my belief that it is only once a researcher has taken this step that they can become part of participatory research and be open to the experience of participation. The researcher too can then start to question her/himself: Why am I doing this research? What am I learning? What is my role? What am I seeking personally and professionally? I believe that one should ask oneself to change before one can ask this of others and it is with this tenet in mind that I wrote the text in the first person.

1.9 The Voice of the Text

Donald *et al.* (1998, p.84), quoting Richard (1962), suggests that "data display may be a form of concrete poetry that attempts to teach the reader about the findings of an investigation ... [and] in the writing of poetry 'everything matters' ". This thesis seeks to reflect the experiences of the last six years. In order to do this, tone, vocabulary, rhythm and the format of the text are called into service in an effort to portray the complexities of the journey. As the above authors contend, such subtleties are not extraneous – "everything matters" (Richard, 1962 in Donald *et al.*, 1998, p. 84). These elements of structure, form and style are intended to re-create for the reader, the researcher's experience in undertaking participatory work, particularly the need to be open to learning and self-reflection. Such self-reflection is not wholly concerned with matters of intellect or theory but also with emotions of excitement, anger, frustration, fear, anxiety, joy and emptiness.

The importance of tone and manner in presentation is clearly evident in the progression of this text. In Phase One, I was the observer and data collector of rural people's riverine knowledge. In Phase Two, I was a researcher who took on the role of facilitator and co-learner and in Phase Three I was a researcher who took on the role of a practitioner and co-learner. My experience with participatory work taught me that my personal feelings are not 'bracketed' from the research and that such feelings inform and underpin the research. As Ely *et al.* (1991, p.109) state: "it is typical for the researcher to experience unanticipated, perhaps chaotic or disorganising emotions during the course of the research". Southwood (2001) reflecting on Ely *et al.* (1991), notes that her research could be likened to that of a "roller coaster" ride (Southwood, 2001, p. 44). Encouraged by these authors, I concluded that the tone of my emotions was central to the experiences described in this thesis.

Below, I give a brief outline of the evolving nature of my responses to the work I was engaged in and its influence on the voice of the text.

As an ‘observer-researcher’ in Phase One, the text of Chapters Six and Seven, which are concerned with this period, offer very little of my ‘voice’ or input. This is typical of a dominant orientation to research (Lincoln & Guba, 1985). For me, this phase was filled with frustration: I so badly wanted to work with the people but I had to realise that the desire to do so and the application of methods through the dominant orientation did not lead to participation by local people. The emptiness I felt in failing to engage with the participants is reflected tonally by the ‘flatness’ of the writing in Chapters Six and Seven. The people had become subjects of my research, a mere research tool. The data display and disclosure of the research in Chapter Six (Phase One - Adult survey) focuses on the quantitative components and is dismissive of the qualitative. Chapter Seven (Phase One – PRA with children and trainees) denotes the initiation of the break with the dominant orientation that was realised in Phase Two. During the PRA work with children and trainees described in Chapter Seven, I began to see myself as part of the research and pay more attention to the qualitative components. This period was both an exciting and frightening time for me, and this paradox is reflected in text.

In Phase Two, I took on the roles of facilitator and co-learner as the work shifted towards a participatory approach that understood the research as being conducted in an unfolding process and with the active participation of the people. In Chapter Eight the text reflects my personal journey as an integral research participant. I hoped that my story would help Water Resource managers to engage in participatory work through an appreciation of the pitfalls and the successes. During this phase I felt excited and joyful about working with the people but I also felt torn between the demands of traditional academic research and the requirements of a participatory process.

In Chapter Nine, which describes Phase Three of the research, I took on the role of a practitioner and co-learner within a participatory framework. The work in Phase Three is presented as a personal journey but the tone reflects two important contexts unique to this Phase:

- a more distant relationship that is inevitable with the larger number of stakeholders at a catchment scale; and
- experiences shared with a team of grassroots facilitators who worked with me in implementation of research activities.

The reflections embedded in Chapter Nine are written in the first person in order to highlight the emotive process of building the capacity of rural people. My experience of having gained insight and internalised understanding and appreciation of participatory methods, is reflected in the tone of this section.

1.10 Research Team and other Collaborators

The research drew on the skills of a range of people including academics, students, researchers, freelance workers, advisers and field assistants. I worked with approximately 34 contract staff (freelance workers, advisers and field assistants and the team of grassroots facilitators) in the research period. This enabled me to access a variety of skills so that I could cope with a workload of decision-making, implementation, information distribution, administration, writing and editing.

A key lesson that I learned from implementing the research was the importance of capacity building in grassroots team members. This served to help me learn the importance of good management, particularly since at the start of the research I had no experience in building up and working with a team. The composition of the grassroots team evolved over time in accordance with the needs of the research and the team members themselves. At the start of the research, I drew on the help of a grassroots interpreter from Hertzog village, Vuyani Rangana. Rangana's main roles were to introduce me to the community people and help me to bridge language difficulties in implementation of the structured interview research activity.

The team evolved further when, in Phase Two, I needed to implement a workshop research activity in which adult members of the community could share and learn about their environment. With this in mind I contracted, trained and worked with a team of three: Vuyani Rangana (Hertzog), Molly-Anne Nqweniso and Tomblie Tom (Grahamstown Township). In addition, a photographer, Angie Lazaro was employed.

In Phase Three, the team of grassroots facilitators was employed as the scale of the research extended to the whole catchment. The team's activities began to increase rapidly during the latter part of 1999 as the various communities as well as government became more committed and involved in the KRVP. At this stage the grassroots team consisted of six members who, through the research and KVRP activities, gained experience working in a range of rural development contexts. The members were Vuyani Hoboshe, Matthews Nontyi, Jerry Ntsebeza, Monde Ntshudu, Molly-Anne Nqweniso and Apollo Phillip. This team worked with participants of both genders, from a

range of cultural and socio-economic groups, and covering a broad spectrum of ages. The skills that the team developed included setting up meetings, interpreting and documenting their ideas in written reports. In addition to the grassroots team, administrators, environmental educators, GIS specialists, student journalists and natural scientists contributed specialist skills to particular research activities when necessary.

I could not have implemented all the work presented in this thesis on my own. This thesis, however, stands as my journey and the interpretations expressed here are mine.

1.11 Confidentiality

The topic of participants' confidentiality was raised with members of the Fairbairn and Hertzog communities as they had been the group most heavily involved in the research. It was collectively decided that no participant would be named in this thesis. Professionals and others who were paid to support the research are identified in order to acknowledge their input and ensure their accountability.

1.12 Terminology

Historically, South Africa was a nation moulded by race-conscious people (Logie, 1997) and 'non-white' citizens were explicitly and deliberately marginalised. The reconstruction of South Africa in recent years acknowledges the effects of racial discrimination and the need to empower those that were disempowered and oppressed. Evidence of this can be found in DWAF's commitment to addressing past inequities with respect to riverine and water resource management and resolving them, as presented in the South African white papers on water resource management (Calder, 1999).

In post-apartheid South African society, almost every ethnic label conveys notions of prejudice. The research for this thesis took place with people who had suffered profoundly due to the colour of their skin. Race had been used to deny them education and access to resources, restrict travel and force their removal from their homes (Hill & Nel, 1996; Jooste, 1998, 1999; The Economist, 2001b). Given this, it was important that the research tackled the thorny issue of race and acknowledged that the 'black' and 'coloured' inhabitants of the Kat River Valley were poor, disempowered and humiliated and that 'white' groups felt guilt, fear and confusion. In terms of the latter, some 'white' participants continued to deny responsibility for the discriminatory acts of

apartheid or continued to express prejudices that ‘named and blamed’ people of colour as inferior and stupid – a ‘them’ and ‘us’ society (Jooste, 1998, 1999; Coetzee, 2000; The Economist, 2001b). Despite the sensitivity that rightly surrounds issues of race in this country, I believe that differences are to be acknowledged and celebrated, not ‘whitewashed’.

The ethnic labels used in this thesis follow those used by Logie (1997) in her work in the same area. She uses the terms ‘black’, and ‘African’ to refer to indigenous *Xhosa* people; ‘white’ to refer to English and Dutch speaking people of European descent; and the term ‘coloured’ to refer to the Khoi, the Khoi-San and those of mixed race. In this thesis, I use the term ‘black’ when speaking of South Africa’s African people.

1.13 Conclusions and Reflections

The introduction to the thesis encourages readers to evaluate the relevance of the information presented, in the light of their own experience. The work described in these pages is embedded in a very specific spatial and socio-economic context and should not be considered as directly transferable to other areas of the country and the world. However, the lessons learned do address the aims and objectives of the research and as such there are theoretical and methodological contributions as well as practical advice relating to the use of participatory methods in riverine and water resource management.

Essentially, this thesis cannot be seen as a set of fail-safe formula stripped of context. It is rather an account of a journey that sought to enable people to participate in IWRM and serves to emphasise that there is no simple, universal method of enabling participation in IWRM. In each case, the process depends heavily on the area’s history, the stakeholders, timing, the environment and the practitioner, all of which are highly mutable factors. There are, however, lessons gained from others’ experience that can be very helpful.

In the light of the adoption of a participatory, critical approach, this thesis reflects on aspects such as practitioner errors, break throughs, deadlocks, threats and opportunities. There is no doubt that during the six-year research process, I made mistakes and stumbled along the way. I believe that the lessons I learned in this way ultimately served to benefit the research and played a vital role in maturing my thinking. It is for this reason that I have included details of such mistakes and the opportunities for learning that they offered.

The research took place during a period of intensive negotiations between specialists who had the challenge of drawing up the NWA and guidelines for implementing IWRM in South Africa. These changes in IWRM in South Africa influenced the direction of the research, its purpose and its conceptual development. For example, DWAF's focus on IWRM in the period 1998 – 2001 resulted in the WRC funding research to facilitate, at catchment scale, the collaboration of Kat River Valley inhabitants in effective IWRM. This trial was an unexpected but valuable platform for further research that enriched the PhD research and enabled more thorough response to the research aims and objectives. In broader terms, this research sought to understand the practical applications of participatory philosophy and methods required by NWA in involving marginalised groups in IWRM.

The thesis contained in these pages has the following characteristics: it recognises the social dimension of resources management; it embraces the need to understand how to involve previously disadvantaged people into IWRM; it acknowledges that participatory approaches are indispensable in enabling previously disadvantaged people to become stakeholders; and it accepts the imperative of exploring the influence of orientation on the outcome and processes of an IWRM project.

Table 1-2 is presented as a summary guide to the thesis as a whole. It marks out broad changes and influences on the research process. (These shifts are discussed in finer detail in each following chapter.) The table also draws attention to the overlaps between phases in order to emphasise that the research process is not a linear, neat and insular activity.

Table 1-2 : Summary of the Research Process and Influences from 1996 to 2002

Year	1996	1996	1997	1998	1999	2000	2001-2002
Chapter	Chapter 6 - Adult Survey	Chapter 7 -PRA with Children & Trainees	Chapter 8 – PRA with Adults	Chapter 8 - PRA with Adults	Chapter 9 – Group growth in the Kat River Valley	Chapter 9 – Group growth in the Kat River Valley	2001-2002 Writing
Research Phase	Phase One		Phase Two		Phase Three		Writing
The Status of the NWA.	Specialist team in process of formulating NWA. The review of the <i>Philosophy & Practice of ICM</i> .		Specialist team in process of formulating NWA.	Promulgation of the NWA completed.	Focus on the implementation of CM under the Policy & Act, e.g. transformation of irrigation boards to WUA.	WISA conference that focussed on CM in South Africa: turning policy into practice.	Development of guidelines & sharing of experiences; Facilitating the implementation the NWA
Focus of the Research	Riverine conservation that builds on local knowledge.	Riverine conservation that builds on local knowledge & collective exploring.	Riverine conservation through providing a forum to build capacity & awareness	Planning an IWRM framework to bring about riverine and water resource management.	IWRM that focussed on capacity building of local people to build IWRM structures.		
Research Participants	Adults in 2 villages	Children in 1 village, Trainees Myself	Adults in 2 villages Team members Myself	Adults in 2 villages Team members Myself	Team of grassroots facilitators Participants from Kat River Valley Stakeholders in KVRP Myself Institutional stakeholders		
Research Orientation	Dominant (drawing on Anthropology & Interpretivism)	Dominant & Participatory (drawing on RRA & PRA).			Participatory (drawing on PRA, AR, TD).		
The Influencing Factors on the Research	Supervisors, traditional academia, earlier fieldwork framed by anthropology.	Supervisors, traditional academic mind set, participatory literature.	Supervisors, traditional academic mind set, participatory literature, discussions with and teaching from Janse van Rensburg and the local people.		Local people my beliefs of change & in participatory work & in professionalism; the Funder; the NWA; international experience.		Value in the learning from the journey; supervisors

Year	1996	1996	1997	1998	1999	2000	2001-2002
Chapter	Chapter 6 - Adult Survey	Chapter 7 -PRA with Children & Trainees	Chapter 8 – PRA with Adults	Chapter 8 - PRA with Adults	Chapter 9 – Group growth in the Kat River Valley	Chapter 9 – Group growth in the Kat River Valley	2001-2002 Writing
Research Phase	Phase One		Phase Two		Phase Three		Writing
Funding	Student bursary from National Research Fund (NRF).		Student bursary from Water Research Commission (WRC).		Funded research from WRC		
Client of the Research	RU examination board to fulfil degree requirements, water resource managers	RU examination board to fulfil degree requirements, School children, water resource managers.	RU examination board to fulfil degree requirements, community stakeholders, water resource managers.		Community people, funders & outside stakeholders		Examiners of the thesis; supervisors; outside advisers & myself
Research Outcomes	Data collection to benefit PhD study and water resource managers; data.	Children & I benefit from the data collection & learning from the process; data collection to benefit PhD study	The community people & I negotiate overlapping needs that ensures a relationship that both parties benefit from	Planning with the community people to bring about implementation.	Working in a full capacity as a practitioner to build capacity for local people to build CF & WUA structures; report for funders & other water resource managers.		Documenting the research Journey
The Researched	Subjects, no input into research.	Subjects, limited input into the research.	Shift to participants having an input into the research.		Active participants of the research; research accessible to the community		

Year	1996	1996	1997	1998	1999	2000	2001-2002
Chapter	Chapter 6 - Adult Survey	Chapter 7 -PRA with Children & Trainees	Chapter 8 – PRA with Adults	Chapter 8 - PRA with Adults	Chapter 9 – Group growth in the Kat River Valley	Chapter 9 – Group growth in the Kat River Valley	2001-2002 Writing
Research Phase	Phase One		Phase Two		Phase Three		Writing
The Researcher	Neutral, objective, <i>universal reality</i> ; [<i>insert: explain</i>], seeking to understand and gain a solution to environmental problems. Being a ‘traditional’ researcher.	Wanting to understand and learn from the children, partial participation of the researcher who observes, some reflection Being a researcher and a facilitator.	Shift to working with local people, building partnerships, internalising participatory principles, feedback knowledge, progressive learning, and reflection. Being a facilitator and co-learner		Working with local people; trusting partnership; democratic principles; trusting participatory principles; developmental perspective - seeing change/transformation as the focus of the research. Full participation of the researcher & participants; progressive learning – practitioner and co-learner		Learning, engaging with the complexity of the data & experience
Methods	Adults: structured interview; identification of patterns; report on broad themes.	Children: RRA & PRA - observation, diaries, visual and verbal exercises.	Adults: PRA & TD - visual; verbal & dramatic exercises.		Adults: PRA, AR & TD - visual; verbal & dramatic exercises.		writing, negotiating, reading, exploring & reflecting.
Motives	Collection of empirical information for an academic audience.	Valuing the local knowledge of the children, being honest and open about the process.	Partnership; the need to uphold, respect & have clarity concerning roles & responsibilities; inviting criticism and learning; honesty; learning to have clear and frequent communication.		Responsibilities clearly defined; reflect honestly & constructively on feelings; plan, implement, reflect thoroughly to ensure professional work; to learn; to understand & change; full participation; lead & to be lead; to manage & task-orientate; to negotiate; be expressive & receptive.		To be honest; to learn; to listen; negotiate.

2 Setting the Context of the Study Area

2.1 Introduction

Appreciating and understanding the socio-economic and historical factors that have such a profound impact on peoples' lives is integral to the process of IWRM. The discussion in this chapter traces the impact in the Kat River Valley of factors such as the loss of land, wars, isolation and abandonment by government policies, the loss of a sense of control over ones life, unemployment and, above all, hopelessness. The last translates into destructive social behaviour including neglect of responsibility, conflict, apathy, poor confidence and a lack of trust. This behaviour is reflected in the management of land and water resources used by the communities.

In the first section of this chapter I provide a broad historical context for the Kat River valley, with the intent of enabling past activities and events to inform both the present and the future. The first landmark within the time period that I concentrate on was the creation of a 'frontier zone' in the valley between the years 1829 and 1850. The 'frontier zone' was intended to serve as a barrier between the Xhosa people indigenous to the area and the 'white' settlers. Later, in 1913 the Land Act had further repercussions for the relationship between the inhabitants and the land they occupied by allocating only 7% of national land for native habitation (Nel, 1998). The creation of the Ciskei homeland, as a racial reserve by the apartheid government in 1972 to 1975 added its own disfigurements to this history of conflict, disempowerment and alienation. Given the above, it is not in the least surprising that the area is still associated with land tenure conflicts (Logie, 1997; Nel, 1998). This chapter aims to highlight the effects of such a history on both the natural resources (in terms of utilisation, activities and outcomes) and on the people (in terms of the different racial groups' relationship with one another and the marginalisation of minorities).

Following this, the discussion narrows to focus on two villages located on the Kat River with a strong relationship with water resources of Fairbairn and Hertzog. Within this focus, the impact of the area's recent history on contemporary life in these communities is traced. A history of war, politics and discrimination has caused high levels of poverty and unemployment and a lack of defined access to farm land and support, further exacerbating levels of internal conflict. This untenable situation led to the people of Fairbairn and Hertzog mobilising their communities, and to the Department of Agriculture's efforts to find an agricultural solution to the crisis. The elements that directly affected the journey undertaken in this research project included the peoples' need for secure water flows, their need for equity and empowerment, and their potential to explore their own lives.

This chapter also provides a description of the broader Kat River valley catchment, an area that unites two districts separated under apartheid. An outline of the various villages, farms and urban areas is also provided.

The final aim of this chapter is to locate the discussion within the broader national context. Within this, South Africa is recognised as a water-deficient nation with rain being both temporally and spatially variable. This country's average annual rainfall is approximately 440mm – of which less than 10% flows into the rivers. Only 20% of the total landmass receives more than 800mm of rain, most of which falls in predominantly mountainous areas (Calder, 1999). The discussion surrounding the physical landscape seeks to provide the reader with the context with which to understand how heavily the majority of rural people depend on riverine resources. This dependence is for day-to-day livelihoods: river water for drinking and irrigating, plants for supplementing their diet and for fuel, rain water for drinking and soil for building and planting. Within this discussion, an overview of the status of the Kat River environment is also provided.

2.2 Location and Geography of the Kat River Valley

2.2.1 The Kat River Valley

The research area forms part of the proposed Catchment Management Agency CMA³ (CMA) of the Fish to Tsitsikamma Water Management Area⁴ (WMA) (DWAF, 1999) as shown in Map 2-1. The research focussed on communities in the Kat River catchment incorporating the Mpofu District (formerly known as the Stockenström District), Victoria East and Fort Beaufort District (Motteux & McMaster, 2001). As shown in Map 2-2, the Kat River Valley is 80 kilometres in length and covers 1600km², with boundaries defined by the Kroomieberg in the west, the Katberg mountains and the Ndidima range in the north west, the Elandsberg mountains in the north east, and the Menziesberg and Juannasberg in the east (Motteux & McMaster, 2001). The biophysical and socio-economic characteristics of the research area are described in this chapter.

³ CMA are described in the National Water Act News as “statutory bodies established under Chapter 7 of the Act. They are governed by a Board representing broad stakeholder groups together with experts and must seek co-operation and agreement on water-related matters from various stakeholders and interested persons” (1999, p.1).

⁴ The National Water Act News explains that “South Africa has been divided into 19 Water Management Areas (WMA) as part of the development of the National Water Resource Strategy. The Act provides for the establishment of a CMA in each Water Management Area” (1999, p.1).



source: DWAF, 1999.

Map 2-1 : Water Management Area in which Research was Conducted

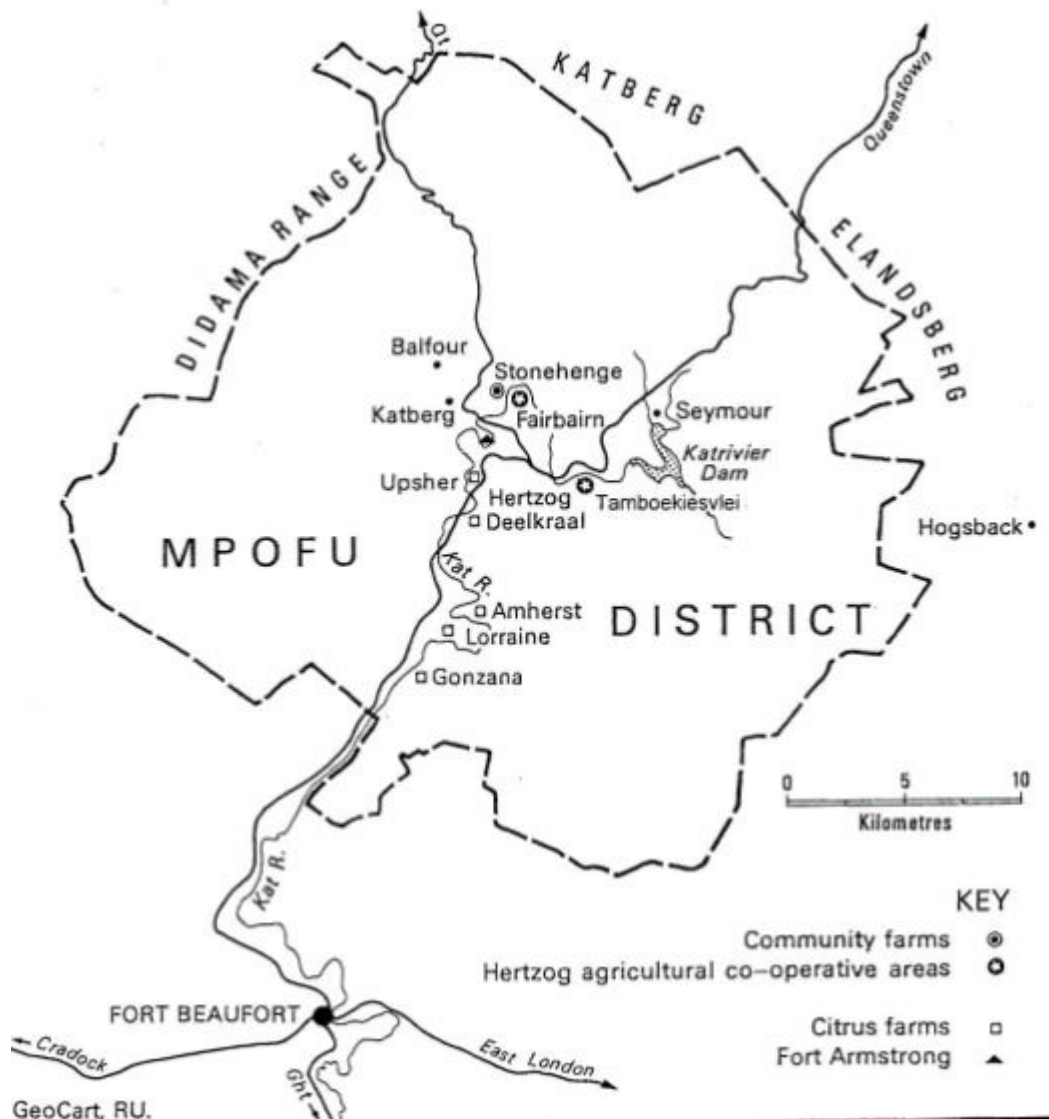
The Kat River valley climate can be described as mild with summer temperatures ranging between 20 and 35 degrees Celsius, and winter temperatures ranging between freezing and 20 degrees Celsius (Magni, 1999). The area receives average rainfall of 600 mm per year (Nel & Hill, 1996a) ranging from over 800 mm in the mountains to 400 mm in the lower valley downstream in Fort Beaufort (Midgley, Pitman & Middleton, 1994).

Fairbairn and Hertzog lie within the mid-reaches of the Kat River in the Mpopfu District and their location is shown in Map 2-3 (Nel, 1998, p. 3). From 1980 this was part of the Ciskei homeland. The early work focussing on the village-scale evolved in later work to cover the catchment-scale. Thus the dimensions of the study area did not remain rigid over the course of the project.



Prepared by McMaster 2000

Map 2-2 : Physical Geography of Kat River Catchment



Map 2-3 : Communities of the Mid-Reaches of the Kat River Valley

There was a shift in emphasis towards facilitating the effective participation of communities in the Kat River in the transformation of the Kat River Irrigation Board into the Kat River WUA as defined by the NWA, as well as the development of a CF. The latter was intended to provide a platform upon which broader issues relating to catchment management could be tackled in a more informal than a formal statutory body such as a WUA. While both the WUA and the CF have a catchment-wide constituency and bring together a wide range of social and economic groups, the CF was motivated wholly by the communities and proved an invaluable context for the empowerment of participating communities both Xhosa, 'coloured' and 'white'. This was so successful that these communities were ultimately able to play a meaningful role in activities leading to statutory activities including determination of the environmental flow reserve (as defined in the NWA) and voting system for decision making in the CF and WUA.

2.3 The Historical Context of the Study Area

2.3.1 Introduction

Through history the Kat River has been used to support agricultural activities. The importance of the river has resulted in a landscape where human settlements line the river's banks and tributaries. These areas along the river frontage were intensively farmed and since the 1970s the mid and lower regions have continued to be irrigated by citrus farmers.

Historical and socio-political factors are crucial to current and future environmental management strategies. These elements from the past influence and shape both stakeholder perceptions and their relationship with the environment (Khan, 1990; Wulfsohn, 1991). Thus it is necessary to discuss the influence that historical events have had on the use of natural resources, particularly in terms of past and current settlement patterns, on trends in the use of land, and the nature of the relationships that have evolved between the people of the area. Here I shall be drawing on fellow researchers' work, specifically, Logie (1997): 'A Study of History of Land Ownership and Land Management in the Kat River Valley from 1829 to the Present' and Nel (1998): 'An Evaluation of Community Driven Economic Development, Land Tenure and Sustainable Environmental Development in the Kat River Valley'.

Increasing awareness of the need to evaluate past activities in order to understand the present situation is shown clearly in Logie's (1997) research on the Mpopu district. Her study demonstrates how historical and political forces have influenced the social foundations of the people in the district. The area was, for many years, a primary contact zone between 'whites', Xhosa and 'coloured' people. In the 20th century this history was aggravated by the creation of the Ciskei homeland. The consequences of this history has been identified by Nel (1998), who points out that "the Kat River Valley has always been one of the most contested areas in South Africa" (Nel, 1998 p. 1).

2.3.2 The Early Settlement of the Kat River Valley

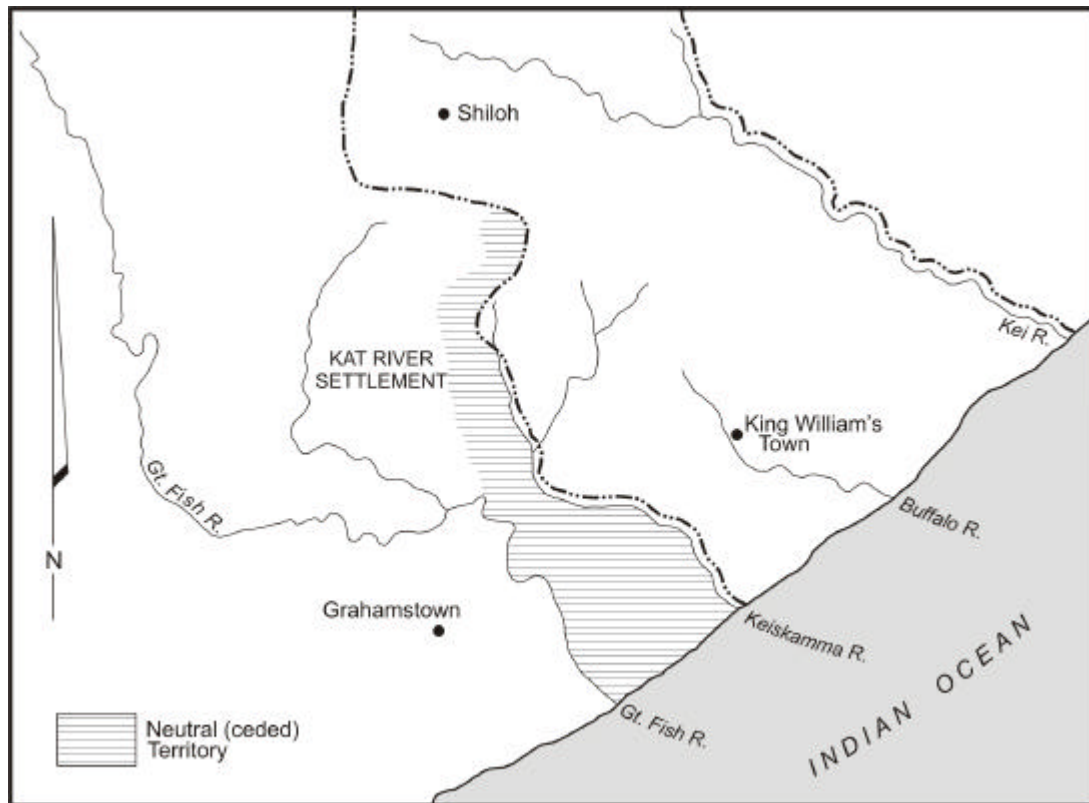
In 1829, the Xhosa people and their chief, Maqoma, were forced out of the Kat River valley. In the years from 1829 to 1850 the area was established as a designated zone for settling 'coloured' people by the colonial government. These 'coloured' people were comprised predominantly of remnants of the Khoi-san as well as freed slaves. Upon their arrival in the area, the new settlers began planting wheat, sorghum and fruit trees (Logie, 1997).

The reason for setting aside the area as a settlement for 'coloured' people was simple: the new inhabitants were intended to serve as a human barricade between the Xhosa and the 'white' farmers (Logie, 1997; Nel, 1998). Thus 'coloured' people were wedged between the English/Dutch farmers and

the Xhosa. The latter were resentful about their expulsion and exclusion from the area. As shown in Map 2-4 (Nel, 1998, p.21) the buffer zone, commonly referred to as a no-man's land, lies between the Fish and Keiskamma Rivers. Throughout its 19th Century history, this 'frontier' was characterised by constant conflict; in the 20th it was integral to the formation of the Ciskei homeland (Nel, 1998).

The state of constant conflict between British settlers and Xhosa people that existed in the area during the years 1829 to 1850 effectively thwarted progress towards establishing a productive and sustainable settlement. The Dutch and English settlers in the vicinity wished to settle on the land in the Kat River Valley, the Xhosa were angered by their expulsion from it, and the 'coloured' inhabitants were positioned in the middle. The ongoing friction resulted in the construction of no less than five military posts in the area the British settlers, all of which were constantly guarded between the years 1820 and 1870. At this time, men in the colony including the Kat River area were conscripted into compulsory military service. The area was strictly controlled, with any criminal action viewed seriously. Despite these efforts, the British settlers experienced encroachment on their property near the frontier by the expelled Xhosa, and complained of cattle theft. During the of 1830's, the Xhosa were once again driven from the land that had been granted in the Kat River catchment to the chief Tyhali, and in 1833 he was finally evicted by Sir Lowry Cole (Logie, 1997; Nel, 1998).

The smouldering conflict erupted into open warfare in the Sixth Frontier War of 1834, the seventh frontier war - the 'War of the Axe' in 1845 and the Eighth Frontier War, which included the 'Kat River Rebellion', in 1851. The last was South Africa's second longest war and saw many of the Kat River 'coloureds' rejecting British rule and joined the Xhosa. The Xhosa and 'coloured' forces attacked Fort White, stormed Fort Beaufort, targeted Fort Hare and then occupied Fort Armstrong, which was a strategic location for thirty days. Finally, in desperation, the British turned their weapons on the fort that they had originally constructed and attacked on the 22nd of February 1851. Their assault was successful and they captured 220 prisoners and burnt down Xhosa and 'coloured' houses. The war dragged on for another year in which rebel soldiers were either sentenced to death or imprisoned for life. Farmers' lives were shattered, their crops failed and their sheep and cattle died in large numbers (Logie, 1997; Nel, 1998).



source: Branch, B., 1994.

Map 2-4 : The Buffer Zone between the Fish and Keiskamma Rivers

The frontier war and aftermath significantly changed land ownership patterns. It caused the end of exclusive 'coloured' settlements along the banks of the Kat River and displaced about half the coloured farmers as punishment for participating in the rebellion. It opened the door to 'white' settlers, who in time began to dominate the area. Most of the land in the valley was gradually confiscated from 'coloured' settlers, regardless of whether or not they had participated in the rebellion. All farmers had to lay claims for the return of their land and up to half of the original settlers lost their land, either because they were judged rebels or due to being absent. Despite the increasing value of the land, it remained difficult to obtain title deeds and friction continued between the 'white' and 'coloured' inhabitants of the area. Coloured squatters were accused of stealing livestock and crops and the 'white' settlers felt constantly at risk of being relocated (Logie, 1997; Nel, 1998). Some Xhosa people came back as farm labourers in the early 20th century and some retained title deeds to land.

The period after the 1850s was relatively stable and was marked by a drive by 'white' Kat River settlers towards claiming or purchasing land. The allotments apportioned to these settlers were characteristically small with open common land and village settlements dispersed throughout the area. In 1905, the Boedel Erven Act was passed by Parliament and this resulted in land of more than 300 square roods (estimated to be about 1,800 m²) being transferred to settlers if they had occupied the land between 1836 and 1865 (Nel, 1998).

The Act also promised that common land could be subdivided if 75% of the erf holders were in agreement. Thus the Boedel Erven Act (1905) significantly affected how the environment was used, with a shift from small, intensive farming practices to much larger sized farms. It also effectively displaced the 'coloured' people, with the exception of those residing in Tamboekiesvlei because they occupied land gifted to them as a result of military contributions. The deed records, however, represent this area as being farmed by 'coloureds', 'whites' and the Xhosa up until the 1870s (Logie, 1997; Nel, 1998).

2.3.3 The Creation of the Ciskei Homeland

In 1913, the Land Act was enacted to allocate about 7% of South Africa's surface area to native peoples, including the Xhosa. The Native Trust and Land Act of 1936 increased the area set aside for 'non-white' occupation to a 13% of the national total. In terms of these Acts certain (fragmented) portions of land along the old Cape Colony's eastern border were set aside exclusively for African occupation. The 1913 and 1936 Land Acts did not affect the former Stockenström region. However, in the early 1970s the Ciskei Homeland became a focus for massive population relocation (Logie, 1997; Nel, 1998). The transfer of the Stockenström region into the Ciskei led to a mass exodus of almost all 'white' and most of the 'coloured' inhabitants. At the same time, Xhosa-speaking people were forcibly removed from 'white' South Africa and relocated to land that had bought by the South African Development Trust and that became the property of the Ciskei (G.R.C 1988; Logie, 1997; Peires, 1994).

The incorporation of the Kat River Valley area into a homeland state was driven by the apartheid policy of the South African government of the time. Under the auspices of this policy, land in the whole of South Africa was to be divided between 'whites' and 'people of colour'. The consequences were profound and lasting; the 1970s saw spiralling racial segregation, conflict and the increasing marginalisation of Xhosa and 'coloured' people. Within the efforts to create a 'Bantu Homeland', 'white' farmers, shop keepers and entrepreneurs were displaced from the mid and upper Kat Areas. It was within this context that IWRM in the district and the country as a whole became highly centralised with decision-making processes vested in Water Boards which were controlled predominantly by 'white' groups (Rowntree, 1994). 'Non-whites' were not seen as integral to the management of natural resources. Thus they were not involved in any decision-making and were, in fact, deprived of access to the natural basis of their livelihoods without discussion or compensation. Thus many people were alienated from any knowledge and skills concerning IWRM. Furthermore, the turmoil engendered by these actions caused IWRM issues to be ignored (DWAF, 1994; 1997).

The National Party's vision was that the homelands would become separate, independent states. With this in mind the National States Act of 1971 resulted in the Ciskei being granted self-rule. At this point,

the Ciskei was comprised of a collection of small, fragmented pieces of land with the district of Stockenström 'sandwiched' in between. In accordance with the apartheid government's intention to create unified, independent homeland states, a decision was taken in 1972 to introduce a process of consolidation. Thus the fragmented areas of homeland territory, known as 'black spots', would be joined with the 'white spots' that lay between. It was in this manner that the district of Stockenström was incorporated into the Ciskei between 1972 and 1975 as shown in Map 2-5 (Logie, 1997, p.47). The government adopted this measure because incorporation of Stockenström would link northern Ciskei with southern Ciskei (G.R.C., 1983).

The departure in the 1970s of the 'white' and most of the 'coloured' farmers resulted in the farm workers being abandoned, but continuing to live on the land. With the exception of household gardens and a few livestock, the land vacated by 'whites' was not farmed. Although the 'coloured' people of Tamboekiesvlei stated they had farmed the land, my observation and discussions with 'non-coloured' members of the community pointed to the fact that the fields were only ploughed. 'Non-coloured' members of the community interpreted this act thus: "Ploughing marks territory. It safeguards it from others. That group have ploughed for many years" (Hertzog Community Leader, pers. comm., 1996).

By 1981, most of the 'white' farms in the Stockenström district had been bought by the Government, and it was at this point that the district was re-named Mpofu. The expropriation of property from 'white' owners and its transfer to state control ensured the outward migration of 'whites' and 'coloureds' (Logie 1997; Nel 1998). The response by the Xhosa has been recorded as: "The black inhabitants of Stockenström were not sorry that the white farmers were bought out" (G.R.C.,1983). However, the transfer of property to the Ciskei state was soon revealed to be an abandonment by the Government of Ciskei because there were few public programs to support local community development. The Xhosa people perceived that they had been neglected (G.R.C., 1983).

There was a sharp increase in unemployment, exacerbated by the denial of access to the means of production (Hill & Nel, 1996). An area that had become known as one of the foremost tobacco and citrus-producing regions in the country was simply left to stand fallow. There was no clear policy from the Ciskei and local people were not given access to the land for farming. Some ex-'white' farms were taken up by the Ciskei Agricultural Corporation (ULIMCOR), a government parastatal, in order to provide farming assistance to interested 'black' farmers in the Kat River (Logie, 1997; Nel, 1998; Nel & Motteux, 1999).



source: RSA, 1978.

Map 2-5 : Incorporation of the District of Stockenstrom into the Ciskei

By 1984, ULIMCOR occupied most of the citrus farms in the area. The land was divided into plots of 16.8 to 36 hectares and farmed with the vision of training 'black' people to take over ULIMCOR's management. 'Black' candidates were required to have practical experience and training from an Agricultural College and were also required to compile a business plan detailing aims, financial forecasts and management of the land. 'Black' farmers were funded by loans from the Development Bank of South Africa, which enabled them to lease the land for a period of five years (de Wet *et al.*, 1996). The expressed intent was that, after the five-year period, the farmers would be able to purchase the land outright. However, this failed to materialise – no property rights were transferred. This legacy remains today as emergent farmer and as former farm-workers remain on the land, but have no secure property rights and no guaranteed access to it or to the means of production. Only a few farm managers have rights to the use of the land, predominantly in areas such as Lorraine, Klipvlei, Dumrae, Oakdene and Gonzana (Fry, pers. com., 1999).

Not all the land was taken up by ULIMCOR during the expropriation of farms. Most of the land lay fallow with no mechanisms in place to tend it. In some instances the land was given to Ciskei politicians or their supporters (Logie, 1997) and some was leased to the 'white' farmers who had previously worked it. Currently, much of this land has no defined tenure and thus villagers are able to use it opportunistically. For example, some villagers in Tamboekiesvlei, Hertzog and Fairbairn gained permission from the Department of Agriculture in the late 1990's to farm the land (Nel *et al.*, 1997a). A small minority of Xhosa farmers who have had land tenure since the early 1900s also populates the area. This group is based in and around Fairbairn (Fry, pers. comm., 1999) while other Xhosa people in the Kat Catchment are landless.

In de Wet *et al.*'s (1996) opinion, the resettlement of communities in the Kat River Valley did not irreparably damage the environment (as had happened in many of the other homelands). The authors state that the area's fertile soils and good supplies of water and wood proved to be definite advantages. Nonetheless, apartheid forcibly alienated most 'non-white' people from learning about and becoming actively involved in natural resource issues. No facilities were set up to communicate with the local communities about issues regarding their water resource systems and governance (Calder, 1999).

Although the Mpofo district fared better than many homeland districts, it was still characterised by poverty and a lack of opportunities during the 1990s (Nel, 1998). To date, residents have been largely dependent on small, state pensions for their survival. The Kat River valley's inclusion into the Ciskei during the 1970s and 1980s led to it becoming known as the "Eastern Cape Valley that Died" (Hartle, 1990, p. 8). This sentiment was echoed by a school teacher who wrote a plea entitled "Please Save the Kat River Orchards" (1999) to a local newspaper:

How disturbing it is to the human eye to see goats and cattle grazing on the leaves of orange trees that were once the pride of this beautiful valley of ours. Some trees have been reduced to mere skeletons while irrigation pipes and sprinklers litter large sections of these orchards. Mankind is also making his contribution to this scenic deterioration, breaking large branches off these trees for firewood. It is quite obvious that the tenants of these farms do not care about them or have thrown down the sponge (Fort Beaufort Advocate, 23 September 1999).

2.3.4 The End of the Ciskei

In 1994 the homelands were reincorporated into South Africa and concepts such as 'homelands' were removed from legislation. However, these areas – created as 'dumping-grounds' of 'black' people during the apartheid era – still carry heavy burdens of overpopulation, unemployment, economic marginalisation and a critical lack of services (Wilson & Ramphela, 1989; Lemon, 1987). Nel *et al.* (1997a), estimated that in 1990, 75% of South Africa's population resided in these areas, which amounted to only 13% of the national land. Within the Ciskei, some districts have up to 85% of the labourforce formally unemployed. The economy of the Ciskei is dependent upon state pensions and other transfer payments from larger urban centres (Nel *et al.*, 1997a).

Despite the current South African government's concern towards making community-based development pivotal for South Africa's poor the current situation in the district of Mpopo has not changed between 1994 and 2000. Programs such as the Reconstruction & Development Program (RDP) signify that the African National Congress (ANC) has committed itself to reconstruction that addresses the past's inequality and seeks to improve quality of life. This community approach to development seeks to ensure that marginalised groups can have a say in their development (Kepe, 1997). The gap between policy intent and conditions in the Kat River Valley have a significant bearing on the outcomes of this research and the evolution in my own and the community's relationship with natural resources during the course of the research.

2.4 Description of the Villages of Fairbairn and Hertzog

Phase One and Two of the research focussed on the villages of Fairbairn and Hertzog. The following in-depth background to these villages has been constructed through the use of villagers' stories gained from interviews and discussions, as well as through the work of Logie (1997) and Nel (1998). Input on key issues was elicited in a baseline survey in which a total of 55 people from Fairbairn and Hertzog were interviewed during 1996.

Fairbairn and Hertzog/Tamboekiesvlei are neighbouring rural villages, approximately six kilometres apart, situated in the foothills of the Katberg Mountains in the upper catchment of the Kat River. Surveyor-

General Hertzog, of the Cape colony, formally planned the villages of Hertzog/Tamboekiesvlei and Fairbairn as settlements between 1831 and 1834. The settlements were laid out in the form of dispersed clusters with each being approximately six acres each, which shared a large commonage. Hertzog was the district capital for much of the 19th century (Logie, 1997; Nel, 1998). These villages receive an average of 600mm of rainfall per year (Nel & Hill, 1996a) but this is highly variable and so reliable cultivation is only possible if supported by irrigation from the Kat River.

Fairbairn has a population of approximately 1,500 people and Hertzog, 1,000. The baseline survey conducted in 1996 found that the maximum number of people living in one household was seventeen and the minimum was one. The average age of those living in surveyed households was 23 years. The survey indicated that the gross monthly income ranged from zero (19% of those households surveyed) to R3 000 (8%), with the majority of households receiving between R 250 and R 1 000 a month (US \$1 = Rand 5 approx. in 1996). Government transfers in the form of old age pensions contributed around 35% of the incomes.

In the years between 1950 and 1970 the Fairbairn and Hertzog areas were recognised as having soil and topography with a high potential for production. At this time farmers practised a combination of intensive, irrigated farming as well as livestock production, and the area became densely populated by Xhosa and 'coloured' peoples. The Kat River and its tributaries provided irrigation water and became a focal point for the area. It had been intensively farmed using irrigation since 1829. The small size of land allotments along the riparian zone is an indication of the perceived fertility of the area (Nel, 1998). It was further reported in the survey that from the 19th century; the land in and around Fairbairn had been settled by 'whites', and in Hertzog by 'whites' and some 'coloured' farmers. In Hertzog, the 'coloured' population occupied the upper region (Tamboekiesvlei) and the 'whites' occupied areas in lower Hertzog. During this period only three Xhosa families in Fairbairn had secure land tenure (Logie, 1997; Nel, 1998).

During interviews the Xhosa respondents recalled the years of 1950 to 1970 as a period when they were forced to work for commercial farmers even though wages were low. This was the only way they could secure their home tenancy and obtain an income. The baseline survey indicated that 54% of respondents reported that they depended on these wages because land owners limited cattle numbers, while 35% of respondents stated that they were given no land to cultivate. The work forced upon them, the lack of income, the inability to sustain themselves and their families due to the restrictions on cultivation and keeping cattle are clearly demonstrated in the following two statements. The first is from a 44-year-old woman who was born in Hertzog. In the following quote she reflects on her experiences as child in the time before the finalisation of the consolidation of Ciskei:

No chance of ploughing, no housing, no cattle breeding. Livestock numbers restricted. School girl at the time of the coloureds in 1970. Had to work for coloureds. Coloureds had a stock farm. Had many cows. Coloureds took the cow if our numbers too much (Survey, 1996).

A 66-year-old man, also born in Hertzog, reflects on his experiences in the period between 1950 and 1970:

Worked for coloured, not allowed cattle and lands. This was a coloured house. Paid one Rand for one month. Forced to work with coloureds, if I did not work had to move away. I was not too much at school as had to work for coloureds. My forefathers lived here. Even my father worked for coloureds. Before blacks used as cheap labour, in 1993 got R2.50 to pull out the potatoes. Before the leaders not favouring blacks (Survey, 1996).

2.4.1 Land Tenure and Land Relationships in Hertzog

The area of Tamboekiesvlei was allocated to Christiaan Groep, a 'coloured' man, who was held to be hard-working, and who had served as a loyal soldier for the British through the Kat River Rebellion in 1851 (See Section 2.3.2). Groep, with 44 followers, settled in Tamboekiesvlei along the main Kat River (Logie, 1997; Nel, 1998).

During the baseline survey of 1996, a 'coloured' respondent gave the following account: "My grandfather got the land from the Queen from England. He married a Xhosa women and had ten children" (Survey, 1996). The land was subsequently shared amongst the children in ten plots. The respondent referred to this period as the "good days" (Survey, 1996). The land was fully utilised, the family had livestock and grew mealies, pumpkins, wheat and tobacco. "The grazing was excellent. Had fruit trees" (Survey, 1996).

The Hertzog community included the Tamboekiesvlei's 'coloured' population most of whom used small subsistence plots to survive. Prior to the forced removals, this area was a culturally mixed area of 'whites', 'coloured' and Xhosa people. The implementation of the National States Act of 1971 resulted in many 'coloured' families leaving the area as recorded in the G.R.C. (1988):

The long line of heavily loaded trucks bore sad testimony to the fate that has befallen a community of people who have lived for 150 years on land they describe as their 'bloedgrond'. The community that at one stage comprised about 7,000 people has slowly been whittled down as people were forced to move from the area. For those who were part of the March exodus it was not only a case of packing up possessions and uprooting themselves from land which had provided them and their forefathers with a livelihood for many years. The pigs, sheep, goats and chickens running about the place all have to be sold as it is not clear if the people moving to

Friemersheim will have enough land to continue their farming activities. Mrs Gerthe Loodts, who is still very active for her 96 years, and who is a direct descendant of the famous Kat River Commandant Groep, said as she prepared to leave: “We were very happy here and while I feel sad about leaving what can I do when all those around me have gone?” (G.R.C., 1988).

Many Xhosa people remained in the Hertzog community and were mostly former ‘white’ farm workers with no land tenure. The community leader of Hertzog reported in the baseline survey that there had been conflict because a few ‘coloured’ families refused to move. At the time of relocation the ‘coloured’ families owned more than 20 properties (including six large farms) that fetched up to R700 000 when bought by the South African Development Trust. This money was used to buy property in Friemersheim, a Moravian mission station near the Great Brak River. Six families did not support this decision. The 22 months delay between selling the Kat River land and purchasing and moving to the Friemersheim land resulted in increased anger between those for the move and those against. The remaining ‘coloureds’ in the area stated that they were not prepared to leave their land. They had resisted moving (G.R.C, 1988) and continued to live in Tamboekiesvlei.

Interviews conducted in the baseline survey of 1996 with ‘coloured’ villagers revealed the polarised nature of opinions on the topic of the status of the land. Some ‘coloureds’ stated that they still had land tenure while others reported that they shortly expected to receive their title deeds from the ANC government. Others felt that the land was not fully compensated for and that the present government either must reinstate their title deeds or that they should receive additional payouts. For instance, a ‘coloured’ respondent claimed that ‘coloureds’ that had been expropriated were returning to Hertzog in the late 1990s and believed that within the month they would have title deeds to the land:

Waiting for land back, next month we will have the title deeds. We were kicked off the land for little money. Compensation was inadequate thus we will be compensated for our land again. We were wrongly done by, peanuts we got! Our family is coming back. The land was spilt into ten. Now it is completely destroyed – the apartheid did it. It was beautiful (a ‘coloured’ resident of Hertzog, Tamboekiesvlei, aged 54, cited in Survey, 1996).

During implementation of the baseline survey the topic of land was an extremely sensitive one. This was made very clear to me during two consecutive visits to a household in Tamboekiesvlei the first alone and the second with an historian. On the second visit the ‘coloured’ participant chose to change their story from the one originally given to me alone and denied the historian access to documents that had been shown to me the day before. After this visit, I was never welcomed back by these participants. This demonstrated that the local history is a sensitive issue amongst ‘coloured’ people - especially relating to exploring the past and healing relationships with other racial groups.

Respondents to the baseline survey reported that the ‘coloured’ inhabitants in Tamboekiesvlei refer to themselves as the ‘Katrivermense’ (Kat River Valley people), an Afrikaans term that came to imply mastership. This term had common currency amongst the ‘coloured’ people and was used before, during and after the apartheid era. Both Xhosa and ‘coloureds’ who were not part of the ‘Katrivermense’ group reported in the baseline survey that it had made them feel ‘powerless’.

The increase in tension over land in the period since the 1994 elections was perceived by Xhosa respondents to the baseline survey as further fracturing the community in terms of race. This resulted in a lack of communication and understanding between, and to some extent within, racial groups (see Table 2-1). For example: some Xhosa people were seen to be ‘siding with’ ‘coloured’ groups so as to be part of a dominant group. However those ‘coloureds’ who broke away from the ‘Katrivermense’ were concerned by the actions taken by this group and expressed a wish for unity between the races (Survey, 1996). A 37 year old ‘coloured’ woman who had moved to Hertzog on her marriage, reported the following:

I grew up in Balfour. Married and moved to Hertzog in 1981, when it was Ciskei. These other coloured people are horrible. We got kicked out of the church. Now bought a house in East London, want to move (Survey, 1996).

A Xhosa man, aged 22, living in a household of eight people in Hertzog stated:

In these times the blacks that are on the coloureds side are being used and will be dropped when they are not needed (Survey, 1996).

Table 2-1 : Effects of the Divide in Hertzog Between ‘Coloured’ and Xhosa People

	% of Positive Responses (n=55)
Lack of communication between racial and interest groups	73%
Lack of understanding between racial and interest groups	65%
‘Coloureds’ ruling and dominating decisions	42%

(Source: Survey, 1996)

Survey participants perceived that since South Africa’s 1994 elections the dominant ‘coloured’ group failed to inform or include the outsider ‘coloureds’ or Xhosa people in any development schemes. Survey respondents who perceived that this had resulted in a selective group of ‘coloureds’ dominating current development and community decisions, considered this very damaging. Among the marginalised groups, participants in the survey frequently expressed discontent and resentment. A 48-year-old Xhosa man, who had grown up in Hertzog, reflected on the situation as follows:

The conflict is just the split between coloureds and blacks. The coloureds just want to dominate blacks. At this level there is no development at all just because they are fighting each other (Survey, 1996).

A common example used by the non-dominant group to illustrate their plight was the way in which the dominant 'coloureds' fenced their ploughed fields around Tamboekiesvlei without consulting the whole community. The fencing is continuous with no gates or openings that allow people to access their homes conveniently. This resulted in some inhabitants having to walk a considerable distance to get around the fence on their way to fetch water, visit friends, shop and go to their land. It was also stated that the dominant 'coloureds' claimed the fenced fields as their private property. The depth and intensity of the controversy is captured in the following statement from a 66 year old Xhosa inhabitant of Hertzog:

Coloureds just fenced the land and said don't use. Just dictating. Now look, my house is there and the gate other way. I am getting old. I walk that side of the field. You see? I walk far for my house. This way, that way (Survey, 1996).

2.4.2 Land Tenure and Land Relationships in Fairbairn

Fairbairn was established as a community during the early part of the 19th century. The area was settled by 'white' farmers with three Xhosa families obtaining title deeds (Nel, 1998). These farmers practised a combination of intensive, irrigated farming and extensive grazing on the surrounding commonage plains. The three Xhosa property holders still hold the title deeds and are prominent members of the Fairbairn community. However, accurate records for the historical period do not exist and therefore in this section I rely on oral history collected from the baseline survey conducted as part of this research. Survey respondents perceived that 'white' farmers owned the land in Fairbairn in the period from 1950 to the early 1970s. Unlike Hertzog, no 'coloureds' owned land or lived in Fairbairn (Survey, 1996).

At the time when the Survey (1996) was conducted, most Xhosa-speaking people resident in the area had been farm workers between 1950 and 1970, although there had been some influx of people relocating to live near relatives. In the latter instance, these new arrivals either built new houses or took over the houses of 'whites' who were forced to leave. Six respondents in Fairbairn stated that they still lived in the houses which were built for the labourers (Survey, 1996).

The baseline survey of 1996 indicated that 'whites' employed 59% of Fairbairn respondents before 1970. During the 'white' occupation of the land 41% of the Fairbairn respondents reported that their cattle numbers were restricted and that they were not given a piece of land to cultivate. 21% of respondents to the 1996 survey identified meagre earnings as farm labourers as a feature of concern.

Respondents reported that during the years 1950 to 1970, 'white' employers mistreated Xhosa labourers. The 1996 survey indicated that 18% of Hertzog and Fairbairn respondents recalled being mistreated. Respondents to the 1996 survey stipulated that such abuse took the form of being treated

worse than an animal, being beaten and being discharged with little explanation. Interviews indicated that 8% of respondents had moved from farmer to farmer due to bad treatment. A selection of respondents' accounts gives an indication of the feelings around this sensitive subject. A Xhosa man aged 41, said: "The whites treating blacks as dogs, could not continue with schooling" (Survey, 1996). The following quote from an 83-year-old man shows the paradoxical working relationships between the 'boss' and farm labourers:

In that time I was working for Mr [X] but this chap was better because he used to give me R8 per month. He was nice. He used to beat us as workers, so that's why I moved away from him. Then I moved to Mr [Y] he used to give me R1 (per month) and those rations of mealies. I used to work for him in the fields and livestock (Survey, 1996).

A 67-year-old man said:

In those days of the whites the blacks were not allowed to farm for themselves. In those days I was a shepherd for whites. So blacks were gaining nothing from whites just R2 per month. In those days if you were living under a white man if you didn't want to work you get fired away (Survey, 1996).

Although the Hertzog and Fairbairn communities are in close proximity and belong to the same agricultural co-operative, called – Hertzog Agricultural Co-operative (HACOP), 67% of Fairbairn respondents said that they 'know nothing' of Hertzog's current racial problems, as is demonstrated in the following quote from a 49-year-old Fairbairn respondent:

"Locally got the communication and happy. Never poor communication. We know each other. Hertzog do not know too much about" (Survey, 1996).

The main reason for this was that there was no group competing for development or calling for land rights. Even the three Xhosa property owners saw their livelihoods linked with the broader Fairbairn community where they could benefit from working together.

2.4.3 Hertzog Agricultural Co-operative (HACOP)

HACOP is an important example of local communities in the Kat River valley working together and organising themselves for action. As such, it mirrors much of the human capital implied as necessary for IWRM in South Africa under the NWA.

In 1993, the first attempt to develop a community-based agricultural project through the local 'coloured' church took place Hertzog/Tamboekiesvlei. It became apparent that the development project was solely for 'coloured' people, which resulted in a breakaway of a 'coloured' leader to work with the Xhosa

people. This break away led to the development of HACOP, the reasons for which were identified by the 'coloured' leader as follows (HACOP leader, pers. comm., 1996):

We must work together. Development must be for both Xhosa and 'coloured' people. The 'coloured' people are angry with me, but this is the new South Africa. Development is for everyone. I am staying to make sure development is for all. Anyone can join HACOP, 'coloured' and Xhosa. Anyone.

The high levels of poverty and unemployment, the acknowledgment of the need for change, the breakdown of the Ciskei controls, the departure of authoritarian 'white' farmers in the mid 1990's inspired the people of Fairbairn and Hertzog (including Tamboekiesvlei) to meet with a view to working together. The village people evaluated their desperate situation by means of a series of workshops and decided that their only hope for development lay in farming. As ex-farm labourers, most of the inhabitants were united in their conviction that farming was a strength. The decision was taken to form an agricultural cooperative, the Hertzog Agricultural Co-operative (HACOP), that would make use of the abandoned land and infrastructure in the area surrounding Fairbairn and Hertzog. A democratically elected committee was chosen to guide the process. Two key members of this committee proved themselves highly proficient, resourceful, keen and innovative and became widely recognised as HACOP's leaders (Nel, 1998; Nel, 1997).

The afore-mentioned key committee members consulted with the Department of Agriculture, a commercial bank and external business on behalf of the communities. Through these meetings permission was granted for the communities to make use of the abandoned fields and infrastructure such as water pumps, irrigation piping and sprinklers (Nel, 1998; Nel, 1997). In 1997 the Department of Agriculture provided further land security for HACOP farmers by providing a lease for a period of 11 years and 9 months (HACOP Leader, pers. comm., 1997).

In August 1994, the community people of Fairbairn and Hertzog formalised HACOP as a Section 21 company and agreed upon the following Constitutional aims:

...to educate and empower members of the community who have an interest in agriculture; to operate a self-sustainable and economically viable gardening project on one hectare of land; to produce fresh vegetables for the local market and neighbouring towns throughout the year; to put to optimum use the available agricultural land; to promote an agricultural culture; and to generate a liveable income for each member (Nel, 1998, pp. 65 – 66).

In 1996, only 83 plots of land could be cultivated because there was a shortage of irrigation pumps, piping, diesel, tractors and ploughs. Even after the land lease was granted by the Department of Agriculture these inputs made it difficult for HACOP to expand (Nel *et al*, 2001). By 1996, 47% of

respondents to the 1996 baseline survey were HACOP members and a further 4% proposed joining in the near future (Survey, 1996). Respondents reported that HACOP had helped members enormously by providing employment and a chance to earn a living. Results of the survey indicated that 40% of the sample joined HACOP in order to have a job and 42% joined to gain an income. 18% of the respondents stated that farming within HACOP's framework protected members against others claiming or damaging the cultivated land. HACOP's ability to provide land security was perceived as a benefit by 18% of respondents. 36% of those surveyed agreed that HACOP had given their lives a sense of purpose and a chance to use their former skills. This is borne out by the following statements from responses to the 1996 survey:

Because of unemployment and because I cannot sit down and do nothing. I like to work with fields (51 year old mother of five, Survey, 1996).

A woman aged 36 living in a household of six people in Fairbairn stated:

Because of unemployment and I am also interested in fields. So I am experiencing something and I am also gaining because I don't have to travel long distances when I need vegetables. I am getting everything from my plot (Survey, 1996).

In terms of reasons why respondents had not joined HACOP, answers included age, sickness, fatigue and the distance to fields or plots. Others mentioned that they were too busy, preferred stock farming, were at school, employed or away looking for a job (many of the latter also pointed out that they were prepared to help in the field). Below are examples of answers that indicate a lack of interest in farming, first, from a 24-year-old woman living in a household of six people in Fairbairn:

I don't like to farm. Don't want to farm. Left school in 1995. Have not looked for work in town. My mother likes to farm. I help her to farm. Helped on the lands since 1994 (Survey, 1996).

Secondly, from a 67-year-old livestock farmer and the head of a household of ten people:

I am not interested in farming, it is better for me to graze livestock (Survey, 1996).

Although 98% of survey respondents from the Fairbairn and Hertzog area support HACOP, the respondents of the 1996 survey were cognisant of the obstacles they faced. The most pressing of these were (Survey, 1996):

- The 'Katriviermense' group opposed the scheme and made death threats towards the breakaway 'coloured' leader.
- Inadequate water pumps, sprinklers and piping reduced the number of people who could join the scheme. As it was, the co-operative farmers had to move the irrigation system daily to ensure that all the crops were adequately irrigated.

- The project did not have adequate finances to purchase diesel for the three tractors used for ploughing. Many farmers found it difficult to operate with the three months' payment cycle for planting, growing, reaping and selling. This situation was further exacerbated by their poverty.
- The community people had few administration skills and little marketing knowledge. This resulted in successfully grown crops rotting in the fields simply because there were no buyers.
- When they did succeed in attracting buyers, the farmers became dependent on those buyers who could collect their produce as the community did not have a truck to transport surplus produce to distant markets. In one instance, the farmers lost an entire truckload of produce to a buyer who collected their produce but failed to pay them.

During the six years of my research, HACOP members did secure support from NGOs for crop inputs such as seed, irrigation pipes and, later, administration support. However, HACOP's efforts were also hampered by bank debts, frost, drought, produce rotting due to heavy rains, fraudulent buyers, a lack of record keeping, the departure and later death of the 'coloured' leader, a lack of committee elections, no buyers and poor marketing.

HACOP's difficulties exemplify how a community owned and driven initiative can be severely hampered by the socio-political context in which it is implemented and local economic history. Participants lacked confidence, writing and numerical skills, experience, knowledge and an acceptance of their rights and responsibilities. Given this, capacity building and the creation of institutional frameworks were of critical importance in order to facilitate the communities' efforts to take control of their lives and environment.

2.5 Broader Social Landscape of the Study Area

The expansion of the research in the third phase of the project necessitated working with a wide range of user groups including the urban municipalities of Seymour and Fort Beaufort (See Map 1-1 and Table 2-2). As Table 2-2 adapted from Motteux, 2001, shows, these communities are much larger than Fairbairn and Hertzog, with better infrastructure and public institutions. The rural service centres in the former Ciskei – Seymour and Balfour – are currently small and impoverished, and suffer from a legacy of disinvestment, economic collapse, political control and endemic poverty (Nel & Motteux, 1999). Fort Beaufort is the major town and rural service centre for the Kat River valley and the Fort Beaufort magisterial district, with a population of approximately 25,000. There is, other than the citrus processing and packaging plants near the town, little other industrial activity. Groups identified as having an interest or stake in management of the Kat River include the Kat River Co-operative (Katco.) and the municipality. The Kat River Co-operative is a purchaser of much of the citrus from the former ULIMCOR farms and the lower Kat River citrus farmers. The operation provides one of the biggest employment opportunities in Fort Beaufort.

The lower and mid Kat River valley is occupied by citrus farmers who have extensive, privately owned citrus estates – see Riverside Enterprises and Lower Kat Citrus Farm in Table 2-2. These farmers were also participants in the research and had an interest in meeting the exacting international standards of environmental management systems (ISO 14000) which are closely aligned to the objectives of the NWA. This resulted in these farmers investing in best management practices and continued improvements that required human and financial investment. One of the largest expenditures since the 1994 democratic elections was the construction of a packing shed that prepares local fruit for the export market, particularly European Union retailers such as Sainsbury and TESCO. These citrus farmers add value to the water of the Kat River and are an important economic resource in the catchment.

Table 2-2 shows that the middle to upper reaches of the Kat River valley are populated by poverty-stricken, Xhosa communities (for example Tamboekiesvlei, Upsher, Paradise, Picardy) that seek improved and regular domestic and agricultural water supplies. Nel (Nel & Hill 1996a, 1996b, 1996c; Nel, 1997; Nel *et al.*, 1997a, 1997b; Nel, 1998; Nel & Motteux, 1999) has conducted a close study of the current status of communities of the former homeland and I review his work on conditions in the former Ciskei to shed light on life in the Kat River valley.

On average, 70% of former homeland residents are classified as economically poor. The average income per person, per month is R192. Approximately 60% of the population are illiterate, with only 10% holding some recognisable form of skills. The only means of formal employment are in state services (such as teachers or forestry workers employed by the municipal council) and in small, formal sector businesses in towns. The majority of inhabitants depend on informal income sources and state pensions. 45% of the population is under 14 years of age. There is a serious shortfall in all forms of infrastructure, including roads, water and electricity connections, with sewerage effectively being non-existent.

Table 2-2 : Local Stakeholder Groups in the Kat River Valley

Local Stakeholder Groups	Description of Stakeholders Groups	Population
Seymour Service Centre	Small, impoverished, rural, service centre. Water source: Kat Dam and some communal standpipes. Shortfall in all forms of infrastructure in terms of roads, water, telephones and electricity connections. Sewerage is non-existent and the 'bucket system' is utilised. Absence of any formal businesses or industries in the service centre, with the exception of a few general stores and <i>spaza</i> shops. Very little farming. Organisations housed in Seymour include the Masincedane Development Corporation, TLC office, World Vision, GTZ (German Bilateral Aid Agency). Crèche, Primary Schools, High Primary Schools and a High School.	5000

Local Stakeholder Groups	Description of Stakeholders Groups	Population
Balfour Service Centre	<p>Small, impoverished, rural, service centre.</p> <p>Water source: Kat River, Balfour River, some tapped water.</p> <p>Shortfall in all forms of infrastructure in terms of roads, water, telephones and electricity connections.</p> <p>Sewerage is non-existent with some households having site and service toilets and bucket systems.</p> <p>Absence of any formal businesses or industries in the rural service centre. Few general stores and <i>spaza</i> shops.</p> <p>Limited farming.</p> <p>Organisations housed in Balfour include the TRC office, Philani and Working for Water.</p> <p>Crèche, Primary Schools, High Primary Schools and a High School.</p>	3500
Tamboekiesvlei, Fairbairn and Hertzog Communities	<p>Villagers that have access to land.</p> <p>Water source: Kat River, 25 litre drums. Tamboekiesvlei residents have piped water.</p> <p>Poor infrastructure in terms of roads, water and electricity.</p> <p>Few public telephones.</p> <p>No sewerage.</p> <p>Few home stores.</p> <p>Fair amount of farming.</p> <p>Organisations housed in Tamboekiesvlei, Fairbairn and Hertzog include the Hertzog Agricultural Co-operative, Micro Projects, some development from Public Works (Community Hall) and MBB (private engineering firm).</p> <p>Primary Schools and a crèche.</p>	2 500
Upsher, Paradise Plateform & Picardy Communities	<p>Most surrounding citrus land has been transferred by ULIMCOR to selected managing farmers.</p> <p>Ex-farm labourers do not have access to the land.</p> <p>The only exception is the Upsher women have access to 1 ha of land on the property of a citrus farmer.</p> <p>Water source: Kat River.</p> <p>Poor infrastructure in terms of roads, water and electricity and public telephones.</p> <p>No sewerage.</p> <p>Few home stores.</p> <p>Upsher has a community-based organisation, namely Zamakphila.</p>	1000
Amherst, Oakdene, White, Tidbury Toll and Gonzana Communities	<p>Most of the surrounding citrus land has been transferred by ULIMCOR to selected managing farmers.</p> <p>Ex-farm labourers and villagers do not have access to land for farming.</p> <p>Water source: Kat River.</p> <p>Poor infrastructure in terms of roads, water and electricity and public telephones.</p> <p>No sewerage.</p> <p>Few home and formal stores.</p>	2500
Blinkwater Service Centre	<p>Small, impoverished, rural, service centre.</p> <p>Community land not utilised.</p> <p>A few individual plots of land are farmed.</p> <p>Water source: Kat River, borehole water, a shop tap.</p> <p>Poor infrastructure in terms of roads, water and electricity and public telephones.</p> <p>No sewerage.</p> <p>Few formal stores.</p> <p>High Primary School.</p>	2500

Local Stakeholder Groups	Description of Stakeholders Groups	Population
Ntilini Community	Village. Individual land-owner community garden. Communal standpipes and electricity. Poor infrastructure in terms of roads and public telephones. No sewerage. Formal stores. Crèche.	3500
Riverside Enterprises	Commercial citrus farms with some livestock. Packing shed. Interest in setting up a conservancy. ISO 14000 accredited. Water source: piped water, Kat River, borehole water. Good infrastructure in terms of roads, water, electricity and telephones. Sewerage exists. Primary school.	200
Fort Beaufort Urban Area.	Urban town. Presence of formal and informal businesses and some industries. Presence of stores, shopping centres, spaza shops, petrol stations, salons, hotels, Bed and Breakfasts. Water source: municipal water from the Kat River. Good infrastructure in terms of roads, water, electricity and telephones. Sewerage exists. A TLC office is located in Fort Beaufort. Crèche, Lower Primary Schools, High Primary Schools and a High School.	10000
Lower Kat Citrus Farm	Commercial citrus farms with some livestock. Applying for ISO 14000. Water source: piped water, Kat River, borehole water. Good infrastructure in terms of roads, water, electricity and telephones. Sewerage exists.	200

2.6 Past Perceptions of the Kat River

This section briefly provides the reader with a context in which to understand the rural people's daily existence. 'Snap shots' of individual's perceptions of the Kat River set the scene for the use and management of natural resources.

Despite the Reverend James Read's 1831 assertion that there was "water in abundance" (Visagie, 1978 in Nel, 1998), archival records reveal continual complaints regarding the lack of water for irrigation. The Boedel Erven Act of 1905 stipulated that every "landowner must allow a small stream of water to flow in the furrow on or adjacent to his property for the benefit and use of downstream users. This was more a matter of consideration than law, however, as there was no penalty within the act for contravention of the requirements, it was therefore impossible to regulate water use by the farmers" (Nel, 1998, p. 40).

Stockenstroom is prime agricultural land with natural sweetveld fed by perennial streams which run despite the drought, and lead to production of fine crops of tobacco and citrus, not to mention the timber of the Katberg forests (G.R.C.1983).

...the finest in Africa.... its hilly and the valleys are most fertile – a fine black mould and water for irrigation in abundance (Visagie, 1978 in Logie, 1997, p. 11).

Intensive farming practices led to the necessity of pioneering the use of extensive canals for irrigation. Within four years of the 'white' settlers arrival in 1831 canals of 1 to 1.5 kilometres in length were common and 55 canals had been dug, totalling 40 kilometres (Logie, 1997; Nel, 1998). Logie (1997) reports that later regulations required settlers to build reservoirs. The tributaries of the Kat River were recognised as having unreliable flows and resulted in early 1900 settlers having to relocate to the banks of the main channel of the Kat River (Logie, 1997).

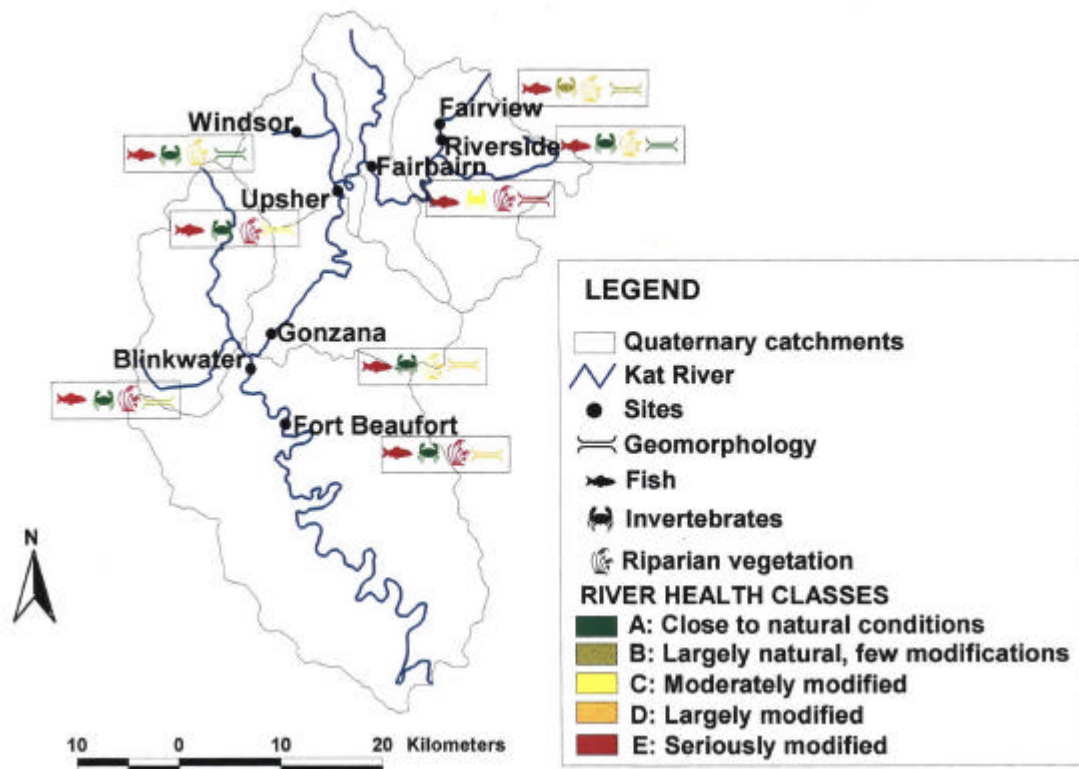
There are conflicting opinions regarding the reliability of water flows in the Kat River. For some, it has permitted successful, intensive, irrigated farming to be pursued. Regardless of the dissent, many have perceived the Kat River as one of the key attributes of the area, as the following statements suggest:

The most dominant physical feature of the Mpofu district in the former Ciskei homeland is the winding course of the Kat River and its many tributaries (Logie, 1997, p. 1).

2.7 Condition of the Kat River and its Riparian Zone

Data relating to the condition of the riparian zone was collected through a bio-monitoring study carried out by a team of biophysical scientists (see Everitt, 1999). This study was commissioned in September 1999 as part of the Kat River Valley Project and provided the biophysical context for the more socially orientated research that formed the main focus of this thesis. The following sections discuss the source of the Kat River, its geomorphology, its fish and invertebrates, the riparian vegetation of the Kat River and water quality in the river.

The condition of the river was assessed at the eight sites shown in Map 2-6. Sites in the upper reaches included the areas of Fairview and Riverside, situated above the urban centre of Seymour. The middle reaches included the villages of Windsor, Fairbairn, Upsher, Gonzana and Blinkwater. The lower reaches of the Kat River included the town of Fort Beaufort. The river has been significantly modified and has signs of deterioration. The Kat River can be described as a work horse river.



Source: Everitt, 1999

Map 2-6 : Location and Health of River Condition Sites

2.7.1 Sources of the Kat River

The headwaters of the Kat River system are the Elands River, the Eyre Stream, the Lushington River and the Wellsdale Stream, all of which meet in the Kat Dam. Tributaries of the Kat include the Readsdale and Fairbairn, Balfour, Buxton, Blinkwater and Xuxuwa rivers, which rise in the west, and the Hertzog and Tamboekiesvlei and Mankazana rivers which rise in the east. The coordinates of the confluence of the Kat River with the Fish River at the south of the catchment are 26,78 degrees east and 33,00 degrees south (Motteux & McMaster, 2001).

The Kat Dam, situated in the upper reaches of the Kat River, is the only major impoundment along the river. The Dam was commissioned in 1970 for the purpose of irrigating alluvial soils on the banks of the Kat River valley. This irrigation was intended mainly for the production of citrus as well as tobacco, lucerne and maize in the area between Fort Armstrong and the lower reaches of the catchment. With the formation of the Ciskei, the irrigation scheme was consolidated into a number of amalgamated schemes such as the Elandsport Irrigation Settlement Scheme and the Kat River Irrigation Scheme. These schemes were dependent on outside assistance from aid agencies and on Ciskei and South African Government financial support in order to survive and were generally unsuccessful once the financial and agricultural assistance was removed (Magni, 1999).

Fort Beaufort draws its water from a weir on the Kat River, after water has been released from the Kat dam. Seymour pipes its water directly from the dam. Other settlements such as Blinkwater, Balfour and Buxton fall outside the area of the Kat River Irrigation system and have to draw their water – for irrigation and domestic usage – from the tributaries of the Kat River on which they are situated (Magni, 1999).

2.7.2 Geomorphological Setting

Agricultural and livestock land uses are the major influences on the geomorphology of the Kat River. In addition, the Kat River Dam situated at Seymour influences flow regimes. These land uses impact on the condition of riverbanks by enhancing erosion through intensive trampling and grazing by cattle and goats. Flow modification caused by the construction of weirs and causeways also contributes to the deterioration of the geomorphological condition of the Kat River which, in turn, impacts on the ecological health of the river. Alien vegetation along tributaries has also had a significant effect on channel morphology and sediment loading.

In the biomonitoring study, reference sites (those sites that are perceived to be close to natural) were selected on the tributaries where channel condition was perceived to be good. At Riverside and Windsor, there is little evidence of bed degradation and aggradation, and no channel modification. Bank stability is good at these two locations with only limited, isolated areas of erosion and good vegetation cover (Everitt, 1999). Elsewhere on the tributaries, however, invasive *Acacia mearnsii* (Black Wattle) has destabilised the channels and contributed to sediment loading of the channel. As noted below these aliens have been removed from the Windsor area, resulting in an improved condition.

The Kat River is impacted by flow regulation, weirs and causeways, sediment inputs resulting from erosion of the catchment and removal of riparian vegetation. The presence of a causeway at Fairbairn has caused a moderate degree of channel modification due to local deposition of sediment derived from severe gully erosion along a small tributary entering the river at this point. The social impact of this sedimentation is taken up later in this thesis. Fairbairn is characterised by a high degree of cultivation and livestock activity in the immediate vicinity of the village which explains the presence of bank erosion and incision at this site (Everitt, 1999). Bank stability at Upsher was better than that at Fairbairn, mainly because good riparian vegetation cover exists at the former. A weir at Upsher results in channel transformation through pooling of water.

The site at Gonzana was situated directly beneath a weir, and consequently, there was moderate to major channel modification at this site. The weir had resulted in the deposition of finer sediment forming a lee

bar, as well as evidence of a flow modification and the formation of a large pool above the weir. The banks at Gonzana showed signs of moderate erosion with some damage to the bank structure and the riparian vegetation (Everitt, 1999).

At Blinkwater, erosional benches are present at this site, allowing good grass cover to be established and therefore enhancing the stability of the banks. The channel has widened with a resulting reduction in the flow. This has contributed to the deposition of finer bed material which, in turn, has led to the establishment of marginal vegetation (*Cyperus dives*) (Everitt, 1999).

Map 2-6 shows the assessed condition and modification of geomorphology in the Kat River.

2.7.3 Fish and Invertebrates in the Kat River

The Fish Assemblage Integrity Index for the Kat River was recently calculated at 33, thus falling within assessment class E (Everitt, 1999). This suggests that the river's biological integrity has been seriously modified, as further illustrated in Map 2-6.

The JLB Smith Institute of Ichthyology collection shows that seven species of fish have been collected from the Kat River system. The species include the chubbyhead barb (*Barbus anoplus*), moggel (*Labeo umbratus*), Largemouth Bass (*Micropterus salmoides*), Banded tilapia (*Tilapia sparrmanii*), Cape kurper (*Sandilia capensis*), the Eastern Cape Rocky (*Sandilia bainsii*) and Redbreast tilapia (*Tilapia rendalli*).

Recent bio-monitoring studies in the Kat River (Everitt, 1999) identified Chubbyhead barb (*Barbus anoplus*) and Redbreast tilapia (*Tilapia rendalli*) at various sites. *B.anoplus* prefers cool waters and is associated with marginal vegetation or cover provided by fallen logs. They feed on zooplankton, insects, seeds, green algae and diatoms. *T.rendalli* tolerates a wide range of temperatures (11° – 37° C) and salinity to 19ppt. It is found in quiet, well-vegetated water along riverbanks where it feeds primarily on water plants and algae, but it may also feed on invertebrates and small fish. The presence of these fish implies that the river is seriously modified, with lower flows and higher nutrient induced algal populations than normal.

Most invertebrates found in the Kat River fall into the more tolerant class groups – those scoring between 5 and 8 (SASS4) were more dominant than those scoring between 1 and 4 (Everitt, 1999). The mayfly *Leptophlebiidae* was found in all reaches of the river, suggesting that while water pollution is minimal, habitat diversity is poor. This does result in the more tolerant families being dominant, however not to the exclusion of the more sensitive (Everitt, 1999).

Map 2-6 shows the assessed condition and modification of fish and invertebrate communities in the Kat River.

2.7.4 Riparian Vegetation

As illustrated in Map 2-6, riparian vegetation – in all reaches of the Kat River – has been seriously modified as indicated by Riverine Vegetation Index scores of 6.4 to 8.9 (Kemper, 1999; Everitt, 1999). In most cases, degraded riparian vegetation can be attributed to the influence of the surrounding land use, in particular cultivation and livestock. A high degree of invasion of the riparian zone by terrestrial tree species is also evident in all reaches of the river.

Invasive exotic tree species that were identified included *Melia azedarach* (Syringa tree) and *Acacia mearnsii* (Black Wattle). Little or no marginal vegetation is present at most sites. This can be attributed to the general lack or absence of the finer sediment needed for the establishment of species appropriate to the water's edge, for example, sedges and reeds. *Cyperus dives*, *Typha capensis* (bulrushes) and *Phragmites australis* (common reed) are the dominant species in areas where marginal and instream (on islands) vegetation occurred. Overhanging vegetation (mostly tree species and bulrushes) occurs in some areas and creates a habitat and refuge for aquatic biota (Everitt, 1999).

Removal of alien invasive vegetation by the National Working for Water program (Calder, 1999) near Windsor has contributed to an improvement in the condition of the riparian zone. Once the alien species had been removed, indigenous species were recruited and this has led to a favourable, multi-layered vegetation canopy at this site. Ground cover (predominantly grass) is good and invasive alien species are now rarely found there, illustrating the potential for these management techniques.

Map 2-6 shows the assessed condition and modification of riparian vegetation in the Kat River.

2.7.5 Water Quality

Although land use impacts on the riverine habitat have resulted in modification to the riverine vegetation and geomorphology, water quality appears natural. Water quality analysis revealed that there were no high concentrations of nutrients, and modified SASS4 scores suggested that water quality was natural in all reaches of the river, the exception being areas near Fairbairn. Water pH was alkaline, ranging from 7.6 to 8.1, reflecting the total alkalinity of the water ranging from 1.2 to 5.4 mg/L CaCO₃. Water salinity was moderate, ranging from 13.3 mS/m to 64 mS/m. Nitrate and phosphate concentrations were measured at a few sites in the bio-monitoring study and showed very low levels (0.5mg/L NO₃, 1mg/L PO₄) (Everitt, 1999). A more recent study highlights the presence of faecal coliforms and high nitrate concentrations near some communities (Soviti, 2001).

Point water quality measurements were backed up by an assessment using individual South African Scoring System Index Version 4 (SASS4) scores based on invertebrate assemblages (Chutter 1998). The SASS4 and average score per taxon (ASPT) scores for habitats sampled in upper and middle reaches of the Kat River were lower than those habitats sampled in lower reaches (Everitt, 1999). In the area from Upsher to Fort Beaufort the water quality was scored as being natural, whereas the Riverside and Fairview sites showed some deterioration. Fairbairn reflected the lowest scores of all the eight sites sampled, with the SASS4 and ASPT scores suggesting some deterioration in water quality at this site (Everitt, 1999).

The riparian habitat in the upper and middle reaches of the river ranged from good to fair. That said, little to no marginal vegetation at some sites reduced the diversity of habitats for the invertebrates, resulting in lower SASS4 scores (Everitt, 1999). When SASS4 scores were adjusted according to the Integrated Habitat Assessment System (McMillian, 1998), Fairview, Riverside, Windsor, Upsher, Gonzana, Blinkwater and Fort Beaufort scored as having natural water (Everitt, 1999). Map 2-6 shows the assessed condition and modification of water quality in the Kat River.

2.8 Conclusions and Reflections

From the discussion presented in this chapter it can be concluded that:

- Kat River catchment has been a frontier between competing groups for 200 years;
- resource use and water resource management have been influenced by social change, economic marginalisation and government policy through out the documented period;
- Xhosa and ‘Coloured’ groups has been oppressed and marginalised economically, politically and socially;
- the social dimensions of management of riverine resources and causes of natural resource degradation;
- sustainability requires that causes are understood and addressed, rather than symptoms;
- a good understanding of history is important in projects that set out to mobilise communities and moves forward; and
- the Kat River is regulated and the catchment is degraded by soil erosion, exotic vegetation and degraded riparian zones, with only small areas that are natural or used as habitat by endemic species.

Given the weight and influence of the political context South Africa, it is essential that IWRM projects take account of historical and political factors that have shaped current environmental perceptions. A deep understanding and acknowledgment of past forces can enable effective IWRM: “one which brings our land and people together into a sympathetic and sustainable relationship for the future” (Khan, 1990, p. 17). In this, I believe that practitioners, researchers and participants should not be focussed wholly on

the past, nor just on the future. What is required is a sensitive and thoughtful respect for past experience and how it informs present perceptions as well as potential action. Stakeholders should be allowed the opportunity to acknowledge how the past has shaped their conceptions of IWRM, of themselves and of other people within the area. This necessarily impacts on their understanding of environmental needs, their capacity to participate and their use of the environment. The work conducted in this research study demonstrated that there exists a constant dialogue between the past and the future.

In areas such the former Ciskei, oppression has left rural people with very few skills and resources to enter into effective relationships with those who benefited from the apartheid. The Xhosa and 'coloured' people in the area have not benefited from access to education, land, skills or favourable policies and hence lack the confidence and knowledge crucial to becoming equal negotiators in the process of change. Even in communities such as Fairbairn and Hertzog, where people have decided to take charge of their development, individuals and groups are continuously and repeatedly confronted with the effects of disempowerment and lack of resources. It was within this context that the work detailed in chapters six to nine was undertaken; it was necessarily a process of learning to share, trust, hear, respect and support one another in learning about IWRM and building institutional structures.

Thus, although South Africa's IWRM policies have shifted to include participation of those marginalised in the past, good intentions are not sufficient to ensure that this will happen. Effective IWRM recognises that good communication is fundamental to all activities. Without good communication, IWRM becomes meaningless. Therefore, in the light of the marginalised Xhosa and 'coloured' communities lacking effective communication with the dominant culture, it was vital that the project invested in capacity building. IWRM is based on core elements, e.g. communication, and within this context these core elements had been destroyed or broken down. Thus it is not simply a matter of changing and implementing a new water resources policy. It is also critical to understand the factors that have created and perpetuated disempowerment so that strategies can be developed to address it and, in this way, ensure that IWRM becomes a reality for current and future generations (Trudgen, 2000).

3 Literature Review

3.1 Introduction

This thesis was conducted during a time of transition and great reform in water resource management policy and practice, not just in South Africa, but also in many other countries that were seeking to enable the public to become part of management and to understand the environmental crisis. This chapter recognises the importance of guiding philosophy as a foundation for examining the different approaches to environmental management. In the range of ideologies attention is given to the difference between anthropocentric (dominant) and eco-centric approaches (new or alternative). It explores the consequences of different orientations on environmental management and on traditional people and their environment.

The terms 'dominant' and 'new' or 'alternative' have been both adopted to distinguish between the different ecological paradigms and development orientations (Fien, 1993; Lincoln & Guba, 1985). Therefore, as this chapter reviews both the ecological paradigm and development orientation that draws heavily on Fien (1993) and Lincoln and Guba (1985), I modified the terms to prevent confusion. Therefore, although I draw on Fien's (1993) writing that uses the term 'dominant' I use the term 'anthropocentric' and 'eco-centric' to refer to the 'new ecological paradigm'. In the development orientation I use the term dominant to distinguish it from the participatory orientation

Section 3.2 details the anthropocentric ecological paradigm, which is concerned only with the current exploitation of natural resources to meet human needs (Fien, 1993). Fien's writing introduces the shift in perspective to an eco-centric (alternative) ecological paradigm, the concept that non-human species have inherent value and also incorporates a revolutionary move towards the acceptance, legitimisation and utilisation of the knowledge of the non-dominant group.

Secondly, the chapter explores the development orientation, namely the dominant or participatory orientation. In the dominant development orientation ideas, approaches and means to bring about change are imposed by an outsider or even fellow villager onto a group of people. This approach treats the interest group as the object of research and does not take into account local needs. The participatory orientation seeks to listen to and work with the interest group in order to develop a solution. A participatory orientation, therefore, focuses on people becoming part of the research and their development.

The review of two different orientations, the environmental and development was considered important as IWRM in a country like South Africa involves both environmental management and human

development. As such the relationship between environmental and development orientations is relevant to IWRM and this thesis. In both orientations, the environmental solutions may use either anthropocentric or eco-centric ecological paradigms, as shown in Figure 3-1. This literature review is framed by the conceptual framework presented in Figure 3-1, which evolved from the research experience for this thesis.

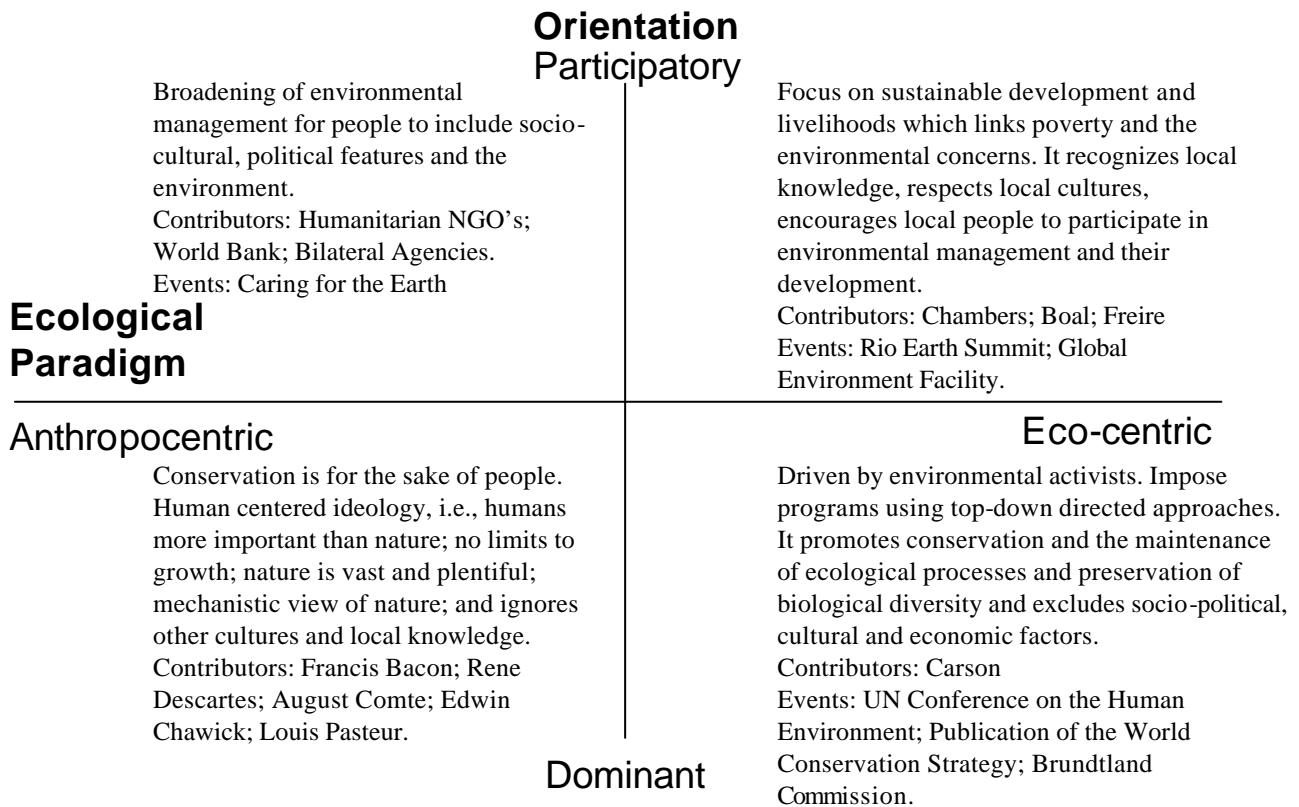


Figure 3-1 : Possible Relationships between Orientation & Ecological Paradigm

The final section in this Chapter examines South Africa's unique situation. It is a country that has suffered from decades of environmental mismanagement and intensified land use primarily institutionalised by apartheid. It forced people of 'colour' ('blacks' and 'coloureds') to live in fragile rural areas which were unable to sustain them, it dismissed local traditional systems and it encouraged dependency. As South Africa begins a new era of transformed social values, the government sees the need to restore their environment as a priority. People must regain control over their lives and over resources (Ramphela, 1991). Writers, Government Departments and NGOs are pre-occupied with the ideological transformations that can enable dramatic political changes within the framework of the current socio-ecological crisis towards sustainable environments (Wilson & Ramphela, 1989; Firth, 1996). This calls for an ideological shift in environmental management from a 'dominant' orientation towards people centred approaches (Motteux & Rowntree, 1999a; Scott & Duenez, 2001).

The previous Minister of Water Affairs and Forestry, Prof Kader Asmal, set two major goals when he assumed office in May 1994. The first goal was to ensure that all South Africans have equitable access to self-sustaining basic water services. The second goal, was the need to review water law to ensure equity. Past water laws were not openly discriminatory but the conjunction of riparian right with apartheid social planning resulted in an extreme prejudice in favour of the minority white group. Since the doctrine of riparian rights connected water rights to the rights of land and the land laws of apartheid prevented black ownership of land outside of the Homelands, the effect of these two structures, operating simultaneously, made it hard for the South African non-white majority to claim water rights (DWAF, 1997).

The principles of the Bill of Rights are concerned with the quality of life. In the context of water resource management there is a clause that ensures the right of all individuals to a safe and reliable supply of water. This is a breakthrough in the 'new' South Africa. According to the Water Services Act of 1997 responsibility includes the allocation of 25 litres of water per person per day within 200 metres of their home (RSA, 1998).

The focus of this thesis is the methods and guiding philosophies for engaging communities to manage riverine resources undertaken in a participatory development orientation. The thesis does not address the different management options on ecological paradigms that are available to communities and researchers or technicians.

3.2 Ecological Paradigms

In this section I sketch the path and effects of the anthropocentric ecological paradigm and review some of the responses that have emerged from the eco-centric ecological paradigm. This section reveals the criticisms by international conventions, writers, nations and NGOs directed at the anthropocentric ecological paradigm and its harmful environmental management practices and its failure to appreciate the complexity of the environment, namely the social, physical, economic and the bio-physical components of the environment. It also identifies that environmental managers need to have a well-founded understanding of the various environmental values and outcomes resulting from concepts that inform possible alternatives in environmental management. This search is grounded in the different approaches to environmentalism that can be derived from a range of environmental ideologies⁵.

⁵ Fien (1993) refers to 'ideology' as a system of "values or belief system that is accepted as fact or truth by some group. It is composed of sets of attitudes towards various institutions and processes of society. It provides the believer with a picture of the world both as it is and as it would be, and, in so doing, it organises the tremendous complexities of the world into something fairly simple and understandable" (Sargeant 1972: 1-2, cited in Fien 1993: 16).

3.2.1 The Anthropocentric Ecological Paradigm

A review of the changing attitude to the environment provides an in-depth understanding of the concepts, values, perceptions, and practice that are shared by a community which have impacted negatively or positively on present people-environment relationships (Huckle, 1991; Bowlby & Lowe, 1992; Barrow, 1995). The shift from pre-scientific to scientific thinking in the seventeenth century resulted in spectacular successes of modern physics, medicine, space technology, and nuclear weaponry. We are so embedded in the doctrine of science that we unconditionally take its ideology for granted, so much so that we almost cannot perceive the likelihood that there might be other ways of thinking (Lincoln & Guba, 1985; Janse Van Rensburg & Paxton, 1998).

The roots of many of the world's present environmental problems lie in the unsound ideologies that are embedded in the anthropocentric ecological paradigm that is often supported by scientific knowledge. The anthropocentric tradition has been remarkably pervasive (Lincoln & Guba, 1985) and has tended to ignore traditional knowledge in favour of scientific knowledge. Barrow (1995), O'Riordan, (1981; 1998; 1995) and Ortolano (1997) trace the evolution of people-environmental relationships by differentiating between anthropocentric and eco-centric approaches to environmental management.

In particular, the beliefs, values and perceptions of the anthropocentric ecological paradigm have become embedded into the power structure of the dominant groups. These dominant groups serve to legitimise and "justify [their] institutions and practices ... it is the take-for-granted common sensical view which usually determines the outcomes of debates on environmental issues" (Cotgrove 1982, in Fien, 1993).

Carson (1965) noted that from the 1960s onwards "the 'quiet crisis' became increasingly visible and discussions over environmental policy became more intense. Smog, urban blight, toxic wastes, loss of productive farmlands to soil erosion, massive deforestation in some parts of the Earth, all continued to be front page news" (Sessions, 1985, p 60). In response to environmental damage, Carson (1965) identifies the 'The Other Road':

The road we have long been travelling is deceptively easy, a smooth super-highway on which we progress with great speed, but at its end lies disaster. The other fork of the road - the one 'less travelled by' - offers our last, our only chance to reach a destination that assures the preservation of our earth. The choice, after all, is ours to make (p. 240).

In the late 1990s, Barrow (1995) states that we have reached a crossroads where there is global awareness of environmental problems due to poor development of the anthropocentric ideologies. Table 3-1 compiles some of the features and influences identified during research for this thesis and modified from Barrow, 1995, which have shaped people and environmental relationships during the past millennium.

Table 3-1 : Landmark Events Shaping Western Ecological Paradigms

DATE	EVENT	WHERE	MAIN FEATURES AND INFLUENCES
Medieval times POST 1086	Environment degradation	Parts of Europe, Mediterranean fringes, Middle East, China & the Americas.	The anthropocentric goal of growth and domination of nature led to deforestation, peat cutting, mining damaged the environment considerably.
1086 AD	Environment degradation	Europe, Mediterranean, West Indies, Brazil, West Africa & the Far East	The human-centred ideology of seeing nature as a resource sanctioned the demand for wood to build warships that led to considerable deforestation
1597	Francis Bacon	Europe	Bacon argued that, provided it was understood and its rules obeyed, nature could be to some extent controlled.
1663	Publication of Discourse on Method by Rene' Descartes	French physicist	Dualistic (mechanistic view of nature: spirit and mind as opposed to matter deemed to be separate, in so-doing setting humankind apart from nature), positivist (recognising positive facts and observable phenomena) and Cartesian philosophy (dualistic rationalism) that underpins systematic science in environmental works.
1700	Newtonian rationalism	Europe	Newtonian science stressed the separation of observer from nature; it generated knowledge. The approach reduced spiritual and holistic perceptions.
1752	Industrial revolution	England	The new cities of the western world, working and living conditions were appalling: there were no methods of waste disposal for human waste or factories untreated effluent resulting in the spread of epidemic diseases.
1798-1857	<i>Cours de philosophie positive, & Systeme de politique positive</i> by August Comte	French writer	Introduced the term 'positivist philosophy'. It was founded on the belief that phenomena of the human social world are no different from those of the natural inorganic and organic world and that they can therefore be investigated through similar means, yielding equally reliable results. Comte's positivism was also to be a kind of new world religion, which would provide general rules for the benefit and improvement of society.
mid 1800's	Scientists – Chadwick, & Pasteur	Europe	Identified epidemics as a result as a lack of sanitation and poor living conditions. This lead to control measures.
1700-1800	Romantics – Wordsworth & Coleridge	England, Europe, Russia & America	Preservation of nature for spiritual and philosophical reasons. Such poets injected feelings of remoteness, mysticism, and solitary.
1830 - 1940	Concepts about the environment & dev't	Europe	Nature could and should be used, even tamed. Base-line data collection illustrates that abiotic and biotic components of the environment were complex and difficult to understand. Concepts were put forward to explain the humankind environment relationship.
1859	Publication of Darwin's The Origin of Species	Europe	The concepts of 'natural selection' and 'survival of the fittest' to human development.
1870	Environment determinism	Europe	Human nature relationship was such that physical factors (like climate) influence behaviour and thus society and development. Scientific environmental determinists linked race to environmental conditions, e.g., hot climate plus lazy results in underdevelopment

DATE	EVENT	WHERE	MAIN FEATURES AND INFLUENCES
1920	Social Darwinism - Herbert Spencer	Europe	Humans part of evolutionary hierarchy. Competition rather than cooperation seen as justifiable behaviour: the group best able to adapt to environment will become dominant
1860 - 1908	National Parks Board & Forest Service	the USA	Preservationists (e.g. Muir) aimed to maintain unspoilt wilderness areas and conservationists (e.g. Pinchot) saw environmental protection combined with careful land use. Conservation and nature protection spread in USA, Europe and European colonies.
1929	Great Depression coupled with drought	the USA	Land degradation marked by soil erosion and dust bowls. The government promoted integrated development of natural resources and initiated the Soil Erosion Service and later the US Soil Conservation Service.
1939 -1945	Second World War	Europe	Environmental exploitation. The rise of destructive nuclear weaponry and DDT

The themes described in Table 3-1 stress that the environmentalist focus was motivated from an anthropogenic ideology prescribing: "only humans have intrinsic value: only people are valuable in and of themselves. Non-human animals, plants, and natural objects have only instrumental value: they have value only as means (or instruments) to meet human ends" (Ortolano, 1997, p 12). The core characteristics of the anthropocentric ecological paradigm centred around the following principles (Ortolano, 1997):

- Conservation: Anthropocentric views of conservation rest on the sound and effective utilisation of natural resources for the benefit of people.
- The safeguarding of public health: The environment must be conserved so that it is able to meet people's needs for safe water and basic sanitation. This was clearly Chadwick and Pasteur's chief concern when they lobbied for pollution control in the 1800s.
- The efficient use of resources: Avoiding the wastage of resources is vital to ensure that the human race does not run out of those which are essential for continuance of everyday life.
- Maintaining the earth's ability to support life: The environment must not be degraded to such an extent that humans, and those species of value to humans, are unable to survive.
- The preservation of places prized for their aesthetic and spirit-renewing qualities: These areas are important as places where people living a technologically orientated way of life can go to be rejuvenated and uplifted.

As can be seen in Table 3-1, the anthropocentric tradition of belief dates back at least to Francis Bacon (1561-1626). Bacon believed that people should follow and apply science to master and organise nature. Through applying rigorous science people would be able to develop and dictate over an ideal world. This anthropocentric tradition is one that has been central in the West and which enlivened much of the scientific progress of the 19th, and 20th century (Bowlby & Lowe, 1992). For instance, in the early twentieth century period, the USA saw the arrival of a conservation movement bound to the advances in sciences to manage natural resources more efficiently.

Fien (1993) outlines Catton and Dunlap's (1980) four assumptions of the anthropocentric ecological paradigm, which they name "human exceptionalism" (p 23):

1. People are very distinct from creatures and have jurisdiction over them.
2. People have control over their lives. They are capable of identifying their own goals and needs.
3. Nature is vast and plentiful and provides unlimited resources for people to meet and satisfy their needs, wants and aspirations.
4. Human history is about economic and technological progress. Progress will never fail because solutions are provided for by technology. With technology there is a solution for every problem.

Research undertaken in the United Kingdom, Germany and the United States of America found that the four assumptions of the anthropocentric ecological paradigm mentioned above support six major clusters of environmental beliefs (Fien, 1993, p. 24):

1. Nature is of less value than people and human dependence upon economic growth.
2. Care and compassion should be exercised only for those 'near and dear' and need not be extended to non-human species, or external environments.
3. Risks to people and nature are acceptable in order to maximise wealth.
4. There are no natural limits to growth.
5. The present structure, institutions and processes of society are satisfactory.
6. The current forms of politics and environmental decision making are satisfactory.

Despite this anthropocentric ecological paradigm, there were philosophers who identified the risks of scarcity and the need to be less anthropocentric in people-environment relationships, for example Malthus (1798) and Ricardo (1817), the Club of Rome Report, 'The Limits to Growth' (Meadows *et al.* 1972; Birch, 1975). However, these philosophers were perceived as identifying human weaknesses and were largely rejected until recent developments in resource economic theory (Schumacher, 1973; Pearce & Turner, 1990). Government institutions and environmental policies in most countries, including South Africa, are still structured around the anthropocentric ecological paradigm (Janse Van Rensburg, pers. comm., 1998).

3.2.2 The Eco-Centric Ecological Paradigm

Since the 1960s there has been a move towards an eco-centric ecological paradigm as summarised in Table 3-2 (Janse van Rensburg & Paxton, 1998; Fargher, pers comm. 2001). Concerned groups have written books, there has been the emergence of environmental non-government organisations and civil

society groups. Environmental decision-makers and experts have come together to discuss the environmental and developmental link at a number of international conventions (Sessions, 1985; Barrow, 1995; Leach, *et al.*, 1997; Janse van Rensburg & Paxton, 1998).

The landmark events described in Table 3-2 illustrate that there are major changes in the way the world is viewed and the place and role of people in it (Holmberg, *et al.*, 1993) that impact on South African's policy and direction (Scott & Duenez, 2001). These changes are in response to the failure of the anthropocentric ecological paradigm (see Table 3-1) to appreciate the complexity of all earth processes and its disregard for the risk of destruction of the environment, and for poverty and injustice (Huckle, 1991). These major changes that are outlined in Table 3-2 are laden with controversy and contention as this shift navigates a pathway towards adequate theory, practice, values and beliefs (Huckle, 1991; Fien, 1993; Janse Van Rensburg & Paxton, 1998).

In 1965, biologist Rachel Carson's book 'Silent Spring' brought attention to a future with no songbirds resulting from the abuse of DDT and other pesticides. Carson's plea was soon united by others, who wrote books, engaged in meetings and provided recommendations for addressing the environmental devastation (Nebal & Wright, 1996). Report upon report (including in 1987 The World Commission on Environment and Development Report, 'Our Common future'), book following book (including the Ecologist (1972) 'Blueprint for Survival'; Schumacher's (1973) 'Small is Beautiful'), conference after conference (including United Nations Conference on Environment and Development in 1992), all conclude that "humans are in trouble and that the Earth is severely stressed" (O'Riordan, 1995, p. 17). Table 3-2 summarises the emerging importance of critical participation by the wider global community and the increasing importance of popular environmental movements (O'Riordan, 1995; Leach *et al.*, 1997; Venning & Higgins, 2001).

Table 3-2 : Responses to Environmental Crisis: Landmark Events

Date	Event & by whom	Where	Main features and outcomes
1962	Publication of Silent Spring by Rachel Carson, environmental activist.	the USA	The influence of agricultural chemical in North America on the rural environment - the silent spring is the result of the song birds dying due to pesticides. The documents mix of scientific evidence and controlled emotions gave rise to the emerging green political lobby.
mid-1960s	Environmental(ist) movement, ecology movement	the West	The environmental movement led to the awareness of: nuclear weapons, Cold War, arms race, pollution, technology, over-population, poverty and conservation of wildlife
1972	Report for The Club of Rome's project on the predicament of mankind - international scientists, industrialists, researchers	Europe	This report on environmental decline impacted on the world opinion at the time. It illustrated that infinite growth in a finite system is impossible and growth beyond ecological limits is the primary cause of environmental problems.

Date	Event & by whom	Where	Main features and outcomes
1972	UN Conference on the Human Environment (UNCHE) - United Nations	Stockholm, Sweden	This conference was recognised as the "watershed". It contested that environmental concerns conflicted with development and aspired to end green imperialism which had excluded the lesser developed countries (LDC) on the basis that they are too poor to care for the environment.
1980	Publication of the World Conservation Strategy - IUCN, UNEP & WWF	Gland, Switzerland	The document excludes the socio-cultural, political and economic feature of the environment by exclusively focuses on ecological issues. It promotes conservation policy as the maintenance of fundamental ecological processes and life support systems, the preservation of biological diversity and the sustainable use of species and ecosystems.
1987	The World Commission on Environment & Development or Brundtland Commission, Stockholm	Stockholm, Sweden	The landmark outcome of this conference was the 'Brundtland Report' that focused on sustainable development, which links poverty and environmental concerns. Economic growth was promoted as the solution to both concerns. The goal of sustainable development was criticised for its ambiguity. It did publicise ideas about human needs, about respecting local cultures, about self-reliance and about extending participation in developments.
1991	Caring for the Earth - IUCN, UNEP & WWF	Gland, Switzerland	The broadening of the concept of conservation to include socio-cultural, political and economic feature of the environment. The notion of sustainable development was challenged.
1992	The Earth Summit (UNCED) - UN & country working groups	Rio de Janeiro, Brazil	Five documents produced: a biodiversity treaty, convention on climate; Rio Declaration, Statement on Forest Principles and Agenda 21. The UNCED failed to reach the global bargain which included commitment over greenhouse gases, forests and sustainable development.
1992	Establishment of Global Environmental Facility (GEF)	Washington (World Bank and UNDP)	GEF established as financial mechanism for Convention on Biological Diversity; UN Framework Convention on climate change and Convention on Combating Desertification.
1992	NGO gathering at the Earth Summit - The International Forum of NGOs & Social movements	Rio de Janeiro, Brazil	A set of Principles for Equitable and Sustainable Societies
1996	Meeting of conservationist - (IUCN)	Montreal, Canada	Commitment made to address issues not dealt with at Rio, e.g., impact of global trade and US private investment on global trade
1997	First State of the World Report- World Watch Institute	Washington, USA	Western governments accused of spending billions subsidising destruction of oceans, atmosphere and land.
1997	UNEP Report - (UNEP)	Nairobi, Kenya	Elizabeth Dowdswell, director of UNEP, viewed population growth, soil erosion, overfishing of oceans, species loss, pollution. Governments criticised for not taking action or honouring pledge made at Earth Summit.
1997	Earth Summit - (Commission on Sustainable Development)	New York, USA	This commission formed to monitor implementation of Earth Summit agreements and review Earth Summit progress after 5 years and assess responses to the Summit.
2002	Rio +10 Second Earth Summit Conference	Johannesburg, South Africa	International meeting to review progress since 1992 Rio meeting, during which developing countries are anticipated to request further financial support from OECD countries for implementation of environmental conventions.

The WCED report or 'Brundtland Commission' introduced a new concept - 'sustainable development', which was defined as development that "meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED, 1987, in Nebal & Wright, 1996, p16). Inherent in this concept is the notion of equity and fairness of access to essential resources by all populations, and future generations (Kirkby *et al.*, 1995; O'Riordan, 1995). This assumes giving the opportunity of sustainable livelihoods to the very impoverished, through "appropriate transfers of technology, capacity building in science and management, and in correct prices for resource use" (O'Riordan, 1995, p. 22).

The Earth Summit (UNCED) continued the theme of sustainable development. In 1992, Holmberg and Sandbrook recorded 70 different definitions of sustainable development (in Kirkby *et al.*, 1995). The concept is controversial, and of late, analysts have attempted to rid the term of the 'development' connotation as it props up the linear theory of progress embedded in the anthropocentric ecological paradigm. This has led to the rise of 'sustainable growth' and now 'sustainable livelihoods' which is more in line with ideals of the participatory orientations (Janse Van Rensburg, pers. comm., 1998). Adam's (1999) observed that by the early 1990's legislation in most developing countries had incorporated the concept of sustainability development. The fieldwork for this thesis has adopted the concept of sustainable livelihoods by integrating IWRM with the daily needs of people.

The eco-centric ecological paradigm has critically examined the deeply rooted assumptions held by the dominant development orientation, resulting in the formulation of alternative assumptions based upon more participatory or inclusive values, beliefs and practice (Fien, 1993). Catton and Dunlap's (1980) assumptions of the eco-centric ecological paradigm are listed below (in Fien, 1993, p. 24):

1. Humans are an exceptional species: However, they still depend upon other life forms for their survival.
2. Social processes influence human affairs, however, the biophysical environment also influences them.
3. The biophysical environment imposes constraints upon human affairs (e.g. human health and survival are possible only under certain environmental conditions).
4. No matter how inventive humans may be, their science and technology cannot repeal ecological principles. Thus, there are limits to the economic growth of human societies.

Fien (1993) states that the anthropocentric and eco-centric ecological paradigms hold opposite positions in their assumptions and beliefs. He synthesises these opposing positions held by the anthropocentric and eco-centric ecological paradigms in drawing out the major beliefs assumptions of these two paradigms respectively (Fien, 1993, p. 24):

- low valuation on nature vs high valuation on nature;

- restricted compassion vs generalised compassion;
- risk is acceptable to maximise wealth vs careful planning to avoid risk;
- no limits to growth vs limits to growth;
- present society satisfactory vs completely new society needed; and
- current forms of politics satisfactory vs new forms of politics needed.

As shown above, the eco-centric movement seeks to question environmental, political and social values and practices. Sessions (1985) shows that in the present time philosophers and theologians are calling for a new ecological ideology. They criticise the eco-centric group for their technical perspective. They argue that the eco-centric movement still works within the confines of conventional political processes without "challenging, questioning or changing the basic assumptions of economic growth and development and as such are trapped in the very political system they criticise" (Sessions, 1985, p. 2-3). However, Murray Bookchin (1970) adds that the eco-centric movement can "become institutionalised as an appendage of the very system whose structure and methods it professes to oppose" (in Sessions, 1985, p. 3). Lotz (1996) acknowledges that the anthropocentric orientation is deeply rooted in many of us and therefore an authentic shift to an eco-centric ecological paradigm is difficult.

Gough (1998a) brings attention to the fact that the agendas of the main conferences, commissions and reports are part of the dominant elite group, of which he is critical. He warns non-dominant groups to be aware of the dangers of taking up the narrative of 'sustainability' manufactured by those who enjoy Western stories of "progress, development and globalisation" (Gough, 1998a p. 4).

Deep ecology holds that anthropocentrism is a central problem in environmental concerns, and label this ecological paradigm the "shallow environmentalism" (Littledyke, 1996, p. 204). Deep ecology presents a powerful alternative ideology through cultivating ecological consciousness (Session, 1985; Littledyke, 1996). Arne Naess, inspired deep ecology thinking in his 1973 article, "The Shallow and the Deep, Long-Range Ecology Movements" (Ortolano, 1997). Deep ecology explores the ideological roots of present environmental problems through examining the human-centred assumptions behind most worldviews of nature. It also explores the possibilities of an expanded human consciousness (Sessions, 1985). Deep ecology supports "pacifism, eco-feminism, consumer rights and animal welfare generally, and seeks to emancipate the world from the oppression of economic and military dependency" (O'Riordan, 1995, p. 252).

John Muir, George Sessions and Arne Naess in April 1984 compiled the principles of deep ecology (Sessions, 1985). These principles are a critique of the anthropocentric principles of conservation and

preservation (Ortolano, 1997). The authors wrote intentionally to encourage the public to reflect and challenge their own understanding, to look at their core values and ideas and understand the outcomes that arise in carrying out these principles (Sessions, 1985).

3.2.3 Summary of the Contrasting Ecological Paradigms

Currently there is much debate over the different approaches and beliefs attached to environmentalism or ecological paradigms, which are summarised in Table 3-3 (Fien, 1993 adapted from Milbrath 1984). For example, Beckerman's (1995) book titled 'Small is Stupid' is purposely set out in sharp contradiction to Schumacher's (1973) 'Small is Beautiful' as he seeks to "challenge the widespread assertion that we are on course towards environmental catastrophe" (Berkerman, 1995, p. 3). Berkerman attacks the assumption that people will exhaust the world's finite resources and fervently attacks the concepts of 'sustainable development' and the 'precautionary principle' by openly using statements such as the "hollowness of the environmentalists" (1995, p. 3) and the "battle against the self-righteous obscurantism of the environmental extremists" (p viii). These views were recently endorsed in Bjorn Lomborg's (2001) controversial book, titled 'The Truth about the Environment' (Lomborg, 2001).

Table 3-3 : Contrasting Ecological Paradigms

Anthropocentric Ecological Paradigm	Eco-centric Ecological Paradigm
1. Low valuation on nature <ul style="list-style-type: none"> · use of nature to produce goods · human domination of nature · economic growth over environmental protection 	1. High valuation on nature <ul style="list-style-type: none"> · nature for its own sake; · worshipful love of nature · holistic relationship between humans and nature · environmental protection over economic growth
2. Restricted compassion for those near and dear <ul style="list-style-type: none"> · exploitation of other species for human needs · lack of concern for other people · concern for this generation only 	2. Generalised compassion toward <ul style="list-style-type: none"> · other species · other peoples · other generations
3. Risk acceptable to maximise wealth <ul style="list-style-type: none"> · science and technology a great boon to humans · swift development of nuclear power · emphasis on hard technology · de-emphasis on hard technology · de-emphasis on regulation; use of the market; individual responsibility for risk 	3. Careful planning to avoid risk <ul style="list-style-type: none"> · science and technology not always good · halt to further development of nuclear power · development and use of soft technology · government regulation to protect nature and humans

Anthropocentric Ecological Paradigm	Eco-centric Ecological Paradigm
4. No limits to growth <ul style="list-style-type: none"> · no resource shortages · no problem with population · production and consumption 	4. Limits to growth <ul style="list-style-type: none"> · resource shortages · increased needs of an exploding population · conservation
5. Present society satisfactory <ul style="list-style-type: none"> · no serious damage to nature by humans · hierarchy and efficiency · emphasis on market · competition · complex and fast lifestyles · emphasis on jobs for economic needs 	5. Completely new society needed <ul style="list-style-type: none"> · serious damage by human to nature and themselves · openness and participation · emphasis on public goods · cooperation · simple lifestyles · emphasis on worker satisfaction
6. Current politics satisfactory <ul style="list-style-type: none"> · determination by experts · emphasis on market control · opposition to direct action; use of normal channels · left-right party axis; argument over ownership of means of production 	6. New politics needed <ul style="list-style-type: none"> · consultation and participation · emphasis on foresight and planning · willingness to use direct action · new party structure along a new axis

3.3 Development Orientations: Dominant and Participatory

This section describes development orientations, introduced schematically in Figure 3-1, starting with the “shadow side” (Janse van Rensburg & Patton, 1998, p. 7) of the dominant orientation. In recent years, there has been a shift in development ideology from the dominant orientation to the participatory orientation. These movements have developed in the mid to late twentieth century as a response to the continuing environmental crisis and recognition that people were an integral part of solutions to manage the environment (Chambers, 1992a). The need for community participation in development of environmentally sustainable livelihoods led to reform of environmental laws and agencies that manage natural resources.

The chapter explores options for development orientation, namely the dominant or participatory. In the dominant orientation an outsider such as a development institution or government agency imposes a solution or set of conditions on a community of resource users. In the dominant orientation these solutions are normally informed by science that is usually developed by the outsider with little or no interaction with local communities. In the participatory orientation an outsider works with a community of resource users to listen to their views and help them develop a solution themselves.

3.3.1 Impact of Dominant Orientation on Traditional People and their Environment

Modern technology derived from dominant orientation activities has contributed to many improvements to society. It has, however, an unaccounted for "shadow side" (Janse Van Rensburg & Paxton, 1998, p 7) of hidden costs and long-term implications that reduce the overall benefits to society. It is this 'shadow side' that has resulted in the environmental crises in rural communities, but which is often unquestioned (Janse Van Rensburg & Paxton, 1998). It has a dangerous, all dominant influence on the environment that must be detailed so as to open up a participatory (or alternative) orientation for practitioners (Motteux & Rowntree, 1998). To more clearly understand the problem, some of the criticisms which continue to be made of the dominant tradition's impact on rural/traditional (non-dominant) people and their environment are reviewed. These outcomes are partly due to the attributes of modernity such as scientism, developmentalism⁶ and technicism⁷. Also, entrenched in the dominant orientation are hegemonic ideologies⁸ of the expert that contributes to its shadow side of unaccounted costs and other externalities.

The historical context of environmental issues, their causes and possible solutions need to be understood to ensure that new management systems are appropriate. The works of Freire (1972; Freire 1974), Huckle (1991), Firth (1996), and Janse Van Rensburg (1995) expose the power and knowledge systems of the dominant orientation. These authors present overwhelming evidence of the dominant power and knowledge systems manifesting in the suppression and undervaluing the knowledge and skills of non-dominant groups. It is in this context of modernity that other cultures have been disregarded and excluded and in so doing often precipitated environmental problems. Such attitudes and behaviour can be traced to the mainstream models of development imposed through colonial conquest and, now, enforced under the guise of economic necessity. This has resulted in a polarisation in terms of power and knowledge between the West and the over-looked 'other' cultures (Pereira & Seabrook, 1990).

The economically dominant nations are reported to have exploited the natural resource base of other cultures through the advent of colonialism. These cultures are perceived to have had "sustainable systems in place" (Pereira & Seabrook, 1990, p. vi). Modern capitalist development encouraged the dominant

⁶ Developmentalism deems that economic development is the sole way to an improved quality of life (Janse van Rensburg & Patton, 1998).

⁷ I refer to technicism as the "unquestioning belief in the value of techniques and technology" in dealing with a situation (Janse Van Rensburg, 1995, p. 152; Lotz, 1996, p. 23).

⁸ Lotz (1996) refers to ideologies that become "hegemonic when they monopolise the range of social and political discourse, and when they constitute the unquestioned assumptions of a society. Ideologies are institutionalised and insinuated by schools, public speakers and the media, a process of great subtlety and complexity" (p. 58).

groups to work towards and invest in short-term benefits which has been shown to be an unsustainable system (Carson, 1965; Pereira & Seabrook, 1990). This development was perceived to deplete natural resources by introducing, for example: ploughs that ploughed too deep, irrigation systems that depleted water tables, fertilisers and pesticides that polluted the earth and became expensive. Through this process other cultures were dispossessed and impoverished (George, 1976; Pereira & Seabrook, 1990).

Detailed empirical studies and reviews of dominant groups imposing scientific systems on other cultures reveal that many technically constructed solutions, proposed because of population pressure, harsh physical environments or a lack of medical or social care, actually failed in the field (Smil, 1987; Manuh, 1992; Pottier & Nkundabashaka, 1992; Ayers, 1995; Mundy & Compton, 1995; Rusten & Gold, 1995, Trudgen, 2000). This failure was often due to the dominant group's inappropriate adoption of an alien scientific framework that ignored the local knowledge, strategies and innovations that other societies often possess (Trudgen, 2000). The West's elitist attitude blocked communication and joint learning with and from other cultures on the assumption that "non-European knowledge systems are primitive and had little to offer the world" (Warren *et al.*, 1995, p xviii). This belief provided the platform for Westerners to fashionably impeach the "stupidity ... or to stress their ignorance" (Blaikie *et al.*, 1987 p. 34) of non-western people. It also, provided the platform to implement large-scale, mechanised, technologically based agriculture at great human and ecological cost, which has contributed to contemporary ecological collapse and poverty (Dankelman & Davidson, 1988).

Scientific knowledge systems face increasing criticism (DeWalt, 1994). The dominant orientation of technology transfer in modern farming often had disastrous consequences such as: 1) agricultural extension workers transmitting scientific knowledge without understanding or communicating with local food producers; 2) failure to recognise the logic and need for local farming systems; and 3) lack of interest to learn from local, 'primitive' farmers. The ideology was based on dominant ('top-down') approaches where the agronomist gives orders that the non-dominant groups implement (Pottier & Nkundabashaka, 1992).

This section brought attention to the 'top-down' systems, which have suppressed, misinterpreted and disregarded traditional knowledge and the role of local resource users in the planning and management of natural resources. This has often resulted in the 'dehumanisation', disempowerment, dependency and even loss of knowledge in traditional societies. The focus of this review is to build on the critiques detailed above and to outline the shift to people centred approaches of the participatory orientation that emphasise the value and importance of knowledge of traditional people as a basis for sustainability. This

has caused researchers and concerned people to seek a participatory approach that acknowledges the complexities and is inclusive of non-dominant people. In the following section, I briefly discuss the assumptions, main features and outcomes of the participatory orientation.

3.3.2 The Participatory Orientation

Participation of local communities in the development and implementation of new knowledge is central to the participatory orientation, which is an alternative to the dominant orientation. Lessons learned from the weaknesses inherent in the latter ideology led to the development of more participatory approaches such as Farming Systems Research (FSR), Rapid Rural Appraisal (RRA) and Participatory Rural Appraisal (PRA) (Chambers 1992a).

The participatory approach questions the dominant orientation's narrow understanding of the environment which excludes the values, knowledge and perceptions of local people. The dominant orientation has no room for spirituality nor the understanding of accumulated knowledge of local people over thousands of years. Although local technical knowledge may have been recognised and integrated with conventional science, the indigenous people's world-understanding and their cosmovision⁹ (Sibanda, 1999) is often dismissed as primitive or pagan-like and is not acknowledged as contributing to sustainable management. There is a need to move away from restricting local knowledge of technical issues to the incorporation of local people's cosmovision, their spirituality, culture, traditional practices and knowledge in which environmental management decisions are often made of the all-encompassing cosmovisions in traditional societies. Therefore, sound environmental management needs to appreciate and incorporate the cosmovision of local people (Sibanda, 1997; Sibanda 1999).

For the last three decades, some of the actions of the dominant world view have been questioned and criticised by Non Government Organisations (NGOs), civil society, academics and field practitioners (Freire, 1974; Pereira & Seabrook, 1990; Chambers, 1992; Warren *et al*, 1995; Trudgen, 2000). In this review, I do not claim that the non-dominant groups had little or no adverse effects on their environment or had perfect systems in place, but rather I want to show some of the outcomes that have arisen from the undertakings of the dominant group's 'shadow side' (Khan, 1990; Ayers, 1995). The participatory orientation relates to development of communities and still has the involvement of outsiders, however the relationship between outsiders and participants is different. I also acknowledge the trap of falling prey to the 'noble savage' view that says that subsistence communities are inherently 'good' or 'sustainable' or 'right' and that migration, technological innovation or changed gender roles are not desirable (Rousseau, 1754 translated by Cole, 1987).

⁹ The African cosmovision sees human beings as an extension of nature and natural resource utilization as celebration of life (Sibanda, 1999, p. 57).

The high rate of failed development projects and persistent economic, environmental and social hardships in developing countries has been attributed to 'top-down' dominant approaches that do not take into consideration people's knowledge, approaches or practices. Starting in the early 1980's there has been a change in orientation and a move towards participatory approaches. Work based on the use of Rapid Rural Appraisal (RRA) and Participatory Rural Appraisal (PRA) has become a prominent feature of charting the transitional shift to sustainable livelihoods in Third World settings (Chambers, 1983; 1992a; Mukherjee, 1993; Burkey, 1993).

At one level RRA and PRA can be seen as a reaction to the previous 'dominant' view and quantitative approaches, which frequently ignored local people and the critical role played by indigenous knowledge and experience. The emergence of RRA and PRA has led to a reappraisal of methods, which has in turn led to a reformulation of rural development strategies systems (Chambers, 1983; 1992a; Mukherjee, 1993; Burkey, 1993). A key feature of PRA is its holistic outlook, in which the interaction between different elements in people-environment relationships is considered. In addition, participatory research has "... revolutionised rural research and action, both in theory and increasingly practice" (Chambers, 1992a, p. 6). A result of on-going debates and critical evaluation of research methodologies, Participatory Rural Appraisal (PRA) has come to enjoy widespread recognition (Lindsey, 1976; Fals-Borda; 1984; Chambers, 1992a; Burkey, 1993). As this research is rooted in participatory research detailed explanation of associated principles and methods are outlined in Chapters Four and Five respectively.

The response to the 'dominant' orientation has included a shift "from top-down to bottom-up, from centralised standardisation to local diversity, and from blueprint to learning processes" (Chambers, 1992a, p. 1). A key move here is towards the incorporation of local people's knowledge systems and values as a basis for analysing, planning and implementing environmental management. This is in strong contrast with earlier work, where the experiences or knowledge of non-dominant people's were either not taken into account (Burkey, 1993; Ayers, 1995; Rusten & Gold, 1995) or regarded in a superstitious light. Until recently, social anthropologists were the principal group interested in exploring such knowledge (Chambers & Richards, 1995).

From this most basic insight into the participatory orientation's interest in indigenous knowledge, I will provide a brief outline of the development of an appreciation for local knowledge and examine its primary purpose. This section also examines the conceptions and representations of indigenous people. RRA and PRA philosophy and methods are discussed in more detail in Chapters 4 and 5 respectively.

3.3.3 Local Knowledge, it's Purpose and Representation

A text written by anthropologists and geographers in 1980 (Brockensha *et al.*, 1980), influenced the study of the importance of local knowledge for development purposes (Van den Breemer, 1992; Warren, *et al.*, 1995).

The value and importance of local knowledge systems is that they provide a store of information representative of a society's needs and beliefs which facilitates communication and development decisions (Warren, *et al.*, 1995). Of paramount importance is the relationship between outsiders and locals based on "understanding and respect" (Warren, *et al.*, 1995, p xv) and a platform for establishing an alternative for 'top-down' relationships (Chambers, 1992a).

The prefaces of both 'People and Environment in Africa' (Binns, 1995) and 'The Cultural Dimension of Development' (Chambers & Richards, 1995) mention that a key aim of these books is to raise awareness of the local people's knowledge as a "critical resource base for the process of development" (Chambers & Richards, 1995, p xviii). This material repeatedly provides a wide spectrum of examples of the sophistication, usefulness and validity of the systems of resource management held within local knowledge (Chambers & Richards, 1995). This is clearly illustrated by Pereira and Seabrook (1990) who provide an insight into the people of India that possessed advanced and superior knowledge in conservation, agriculture, education, literature, music, art, science and technologies such as, astronomy, mathematics, medicine, steel and textiles. These systems provided an excellent and complimentary base for providing full employment, encouraged co-operation and a dynamic system that constantly changed and adapted to new stresses and conditions. Knowledge gained through the accumulated body of experience or passed down information strived for long-term sustainability that ensured "the balanced interaction of the community with the rich domains of the natural environment" (Slikkerveer & Slikkerveer, 1995, p. 13).

The term 'indigenous knowledge' systems has become standardised and is commonly defined as:

"learned ways of knowing and looking at the world. They have evolved from years of experience and trial-and error problem solving by groups of people working to meet the challenges they face in their local environments, drawing upon the resources they have at hand" (McClure, 1989 in DeWalt, 1994, p. 129).

The work of Brosius (1997) links such knowledge to the environment:

"systems of classification, how various societies cognise or interpret natural processes, what such groups know about the resources they exploit, and so forth" (Brosius, 1997, p. 52).

Mundy and Compton (1995) stress the need to understand the interface between local knowledge and patterns of indigenous communication in order to understand how this knowledge can facilitate the development process. Two fundamental characteristics of indigenous knowledge are its stable ["intergenerational communication"] and dynamic aspects ["lateral communication"], (Mundy & Compton, 1995, p. 120) of communication that is accumulated and passed down from one generation to the next. The information is diverse and is transmitted uniquely in each society. Technical, social, entertainment, news, advice and persuasion are communicated through indigenous systems of interactive media (such as puppet shows); forms of social gathering (such as village meetings or religious groups); recognised instruction (such as parent and child or initiation rituals); documented accounts (such as those written, carved, drawn or memorised); informal channels (such as a casual conversation at a well); and direct observation (such as observation of a good harvest) (Mundy & Compton, 1995).

Sources of technical indigenous communication vary among people due to age, sex, experience, occupation and personality. Mundy and Compton (1995) classify five sources of technical information: indigenous experts (skills that provide advice for others, for example farmers); indigenous professionals (expert knowledge that is specialised, for example a healer); innovators (learn through experimenting and trying new ideas); intermediaries (reporters on information) and recipient-disseminators (receivers of information, who respond, react, and then pass it on).

DeWalt (1994) questions the appropriateness of the term 'indigenous' knowledge' and advocates 'local' knowledge. He notes that people develop an understanding of their world through living in an area, which provides the basis for a critical awareness, and understanding of their immediate surroundings. Also, knowledge is "unique" (Warren, *et al.*; 1995, p xv) to a particular culture or society, especially as there are extreme paradoxes, sharp contradictions and diversity that exist within cultural or societal groups (Burkey, 1993; Gay, 1995; Ngobese & Cock, 1997).

Brosius's (1997) close examination of text on the Eastern and Western Penan in the Malaysian State of Sarawak reveals inaccuracies due to generalisations that were made made about these groups. He describes the Eastern and Western Penan as two distinctive groups. His cross-examination found that there are profound differences between these groups with regard to technology, village settlement patterns and social structures. Gay's (1995) assessment of the knowledge of Kpelle farmers at the village level concluded that: "it is an entity which has a corporate understanding, composed of knowledge, the attitudes and the beliefs of the individual members" (1995, p. 269). Incorporated in this analysis is the fact that community knowledge is not static, it is constantly changing and adapting to new situations. These arguments urged me to adopt the term 'local knowledge' when referring to knowledge that is specific to an area and that has not been verified elsewhere.

Although every village is different and is characterised by complexities and divisions (Burkey, 1993), there are themes of knowledge with slight variations that are held widely outside of village and even national African boundaries (Motteux, 1997a; Cocks, 1998). This can be termed indigenous knowledge. For instance, Motteux's (1995) examination of people's perceptions, values and beliefs pertaining to drinking water in Cwebe (former Transkei); Gcinisa and Gwabeni (former Ciskei) in South Africa; and Honde Valley, Bvumba and Harare in Zimbabwe established that different local groups recognise similar symbols and consciously respond alike. In such cases, with the proviso that such knowledge is verified across boundaries or is referred to by other writers as indigenous knowledge, I will use the term indigenous knowledge in subsequent chapters. In contrast, I will use the term 'local knowledge' to recount narratives that are place specific or if the authors of written text use it.

Danger arises when practitioners rely on indigenous knowledge systems and unquestioningly accept them as suitable to environmental circumstances that may have changed considerably or now extend beyond traditional spatial boundaries. For instance, the Communal Areas Management Program for Indigenous Resources (CAMPFIRE) in Zimbabwe presumed the Tongo people were knowledgeable about wildlife whereas in fact their knowledge only exists in theory but not in practice. Sibanda (1999) reports that the younger generations of the Tongo people can talk about environmental practices but do not have the practical knowledge to implement management strategies (Sibanda, 1999).

The tapping of local knowledge, especially among humanists, social scientists and environmentalists is frequently undertaken in a missionary-like manner. The "missionary fervour" (DeWalt, 1994, p. 123) calls for an increased awareness of the outsiders discourse that often transforms "knowledge into something it is not" (Brosius, 1997, p. 66). This is such that the collection and interpretation of local knowledge is based on outsiders' periodic, brief visits to those areas with little knowledge or understanding of the local language. Commonly, environmentalists enrich and add value, wisdom, political rights, or sacredness with authority to local meanings. Environmentalists build on and link local knowledge, for instance, to the preservation and conservation of biodiversity and medicinal knowledge. They may also link what is happening locally to what is happening at a broader scale, for example, in a catchment region. However, some texts reveal enormous inaccuracies that are embedded within western ideologies (Brosius, 1997; Sibanda, 1997; Sibanda, 1998). Such representation of local knowledge is largely employed as "tools of persuasion" (Sibanda, 1997, p. 54) used to access outside resources: money, or other support. Imposing false meanings on a range of peoples, it "expunges others" ...[distorts and] ... thereby collapses precisely the diversity that defines them" (Sibanda, 1997, p. 64 - 65).

3.4 South Africa's Environmental Crisis

This section builds on the literature presented and explores the parallel themes in the South African context. I illustrate the influences of the various orientations on the people-environment relationships in South Africa. The first part of this section briefly discusses the nature of and criticisms of the dominant modernist paradigm and its role in South Africa's environmental crisis.

The environment will be described first in its broad sense and then will be applied specifically to the riparian environment. Evolving developments in the participatory orientation that supersede the dominant orientation are identified. Aspects of the participatory orientation are then outlined, with a view to shift orientations from a 'top-down', blueprint approach to conservation and natural resource management towards a 'bottom up', people centred, process oriented approach which emphasises people's empowerment (Chambers, 1992a).

3.4.1 Dominant Approaches in South Africa: a Brief History of General Environmental Issues

Shortly after the preservation and conservation movement began in America (see Table 3-1) it also gained momentum in South Africa. Motives for conservation in South Africa reflected the dominant conservation and preservation ideologies of America by calling for legislation measures to protect the wilderness for economic and ecological reasons in demarcated areas (Barrow, 1995; Ortolano, 1997). These chosen wilderness areas provided scientists with an opportunity to study natural processes and to understand the diverse genetic patterns that could be used for the development of the agriculture, industry and medicine (Ortolano, 1997). Conservation and preservation bodies in South Africa demarcated State forests as protected areas and established the Pongola, Hluhluwe, Umfolozi, St Lucia and Sabie Game reserves between 1894 and 1898. In 1910, with the establishment of Union, a number of Acts were passed relating to environmental conservation. The increased awareness of degradation led to the establishment of legislation that focussed on issues concerning water and air pollution, forestry, agriculture and soil erosion (Fuggle & Rabie, 1992).

Despite this early conservation, exploitation of land and water resources was occurring in South Africa. In 1922, the interest in nature spread and led to the awareness of the effects of the anthropocentric approach to natural resource management by South African people. The dominant philosophy of colonialism has come under sharp attack for degrading the environment through the use of unsustainable practices and paying little attention to the vulnerability of South Africa's natural resources. The Drought

Investigation Committee of 1922 alerted the public to the possibility of “national suicide if the process of ruthless deforestation, overstocking and poor farming practices was not halted” (Daniel, 1984 in Ramphela, 1991, p. 2). The warning fell on deaf ears.

According to Ngobese and Cock (1997), the understanding of environmental issues in South Africa was founded on and informed by the ‘dominant’ conservation perspective. The actions of conservation and nature protection bodies disregarded non-dominant people’s needs, rights, and dignity. For instance, “the establishment of many game reserves meant the forced removal and social dislocation for local people. ‘Conservation’ therefore meant ‘dispossession’ (Ngobese and Cock 1997, p. 258). Mainstream environmentalists have widely held the myth that poor people of ‘colour’ are not concerned with environmental issues. It has been found that traditional communities have remained outside the existing environmental movement because of the ways in which issues were framed, the kinds of aspects which were focussed on, and the ways those issues were addressed (Taylor, 1993).

In the years leading to the reconciliation of 1994, environmental management in South Africa paralleled that of Europe, United States of America and Australia with a focus on wildlife and soil conservation, but little emphasis on water resources (since it was assumed that there was no shortage) or traditional knowledge (since it was assumed to have no value). As the importance of water resources and the symbolism of its management in reconciliation increased, the water reforms became central to the debate surrounding natural resource management in South Africa (Calder, 1999).

3.4.2 Context for the Transition to Integrated Resources Management

Environmental issues in South Africa need to be examined in their political and historical context (Khan, 1990). In 1994, apartheid was removed and the homeland states were broken down and re-incorporated into South Africa (Levin & Weiner, 1997). Since then there has been a movement in resource utilisation towards the building of a democratic, non-racial, non-sexist, and equitable nation (DWAF, 1997; DWAF & WRC, 1996). This transition is faced with a complex set of factors rooted in social inequality, imbalances of power and lack of communication (Bullard, 1993; Levin & Weiner, 1997). For example, South Africa’s environmental resource management has “an inadequate policy of environmental protection. Environmental controls are extremely fragmented and under-resourced. Functions are splintered between different government departments and enforcement is minimal” (Ngobese and Cock 1997, p. 258).

Levin and Weiner (1997) point out that the architects of apartheid remain instrumental in the conceptualisation of post-apartheid social transformation and work in collaboration with the new group of civil servant and consultants with financial support from both foreign aid money and 'experts' whose

focus is primarily on policy and development plans. Within this context there is a curious mixture of “top-down technicism, neo-liberal economism, and language calling for 'grassroots' community participation” (Levin & Weiner, 1997 p. 5).

In addition, Wulfsohn highlights the perplexities of the environmental transition to more sustainable natural resource management. Former environmental managers in the homelands have been largely technocratic and preoccupied with 'betterment' planning (Seneque, 1982 in Wulfsohn, 1991). Now that this type of planning is "off the agenda" there is "no alternative model" and clearly an need for an alternative approach that recognises the social context of resources and their users in the South African former homelands (Wulfsohn, 1991, p. 496).

3.4.3 How People and Environment are Considered by Policy Makers

An estimated 80% of South Africa's rural communities in the mid 1990s did not have access to any formal water supply system (Murray *et al.*, 1995). Rivers, as a result, provide rural villages with water for household use, drinking and livestock and the riparian zone is a convenient source of gathered products. In these rural settings the riverine areas have become vulnerable and consequently are often over extended (Motteux & Rowntree, 1999a).

South Africa's riverine resources have been called into debate due to concerns about environmental degradation and the need to manage rivers wisely (Auerbach, 1999). In South Africa, “the processes of transformation and democratisation that have been set in motion from 1994, have also strengthened the role of democracy, social justice and equity in environmental decision-making processes. There has been a systematic and gradual transformation of institutional structures and related legislation in South Africa” (Scott & Duenez 2001, p. 4). "Reconstruction and development require a population that is empowered through expanded rights, meaningful information and education, and an institutional network fostering representative, participatory and direct democracy" (Scott & Duenez 2001, p. 4).

This political transformation and the acknowledgment of the riverine resources have provided a climate for the reformation of the water law. The fundamental basis of the NWA is that local people are required to become co-stakeholders with government to ensure that their water resources are cared for and managed wisely for the long-term sustainability of the environment itself and for the future generations. “The National Water Act (NWA) (36 of 1998) and other environmental and resource management legislation are informed by the participatory orientation and require that the public be consulted and participate in environmental decision-making” (Scott & Duenez 2001, p. 2). Despite legislative change, to acknowledge the participatory orientation there has been little reform of institutional arrangements from the dominant orientation, although this change is slowly emerging (Motteux, 2001).

However, the implementation of the NWA is confronted by the reality that the disadvantaged rural communities have suffered decades of dislocation, dispossession and confinement to a servile status under colonial and apartheid policies that have marginalised their local environmental knowledge and status (Greyling, 1998; Motteux *et al.*, 1999). DWAF therefore recognises their responsibility to support capacity building, educational and training (DWAF, 1994). A related issue is the loss of traditional knowledge in many communities as a result of it having been ignored for so long (Sibanda, 1999).

In addition, the past Water Act (Act 54 of 1954) was embedded in western-biased environmental concepts and institutions informed by the dominant orientation emphasising 'top-down' procedures to implement them. Scott and Duenez (2001) have outlined the current shift towards participatory approaches in South Africa: "There has been a rise of environmental social movements, that have begun to challenge the dominance of the state and the mainstream environmental management approach and call for the inclusion of all citizens in environmental decision-making processes. This has occurred parallel to the shift towards public involvement in environmental decision-making proposed by ecologically sustainable development" (Scott & Duenez, 2001, p. 4).

This has led the DWAF to rethink and reformulate the legal framework and institutional structures (Greyling, 1998), to work towards IWRM and changes in line with international trends (Calder, 1999). However, at the time of this research these changes predominantly took place at the national level, often by technocratic planners "within a narrow defined transition to democracy" (Levin & Weiner, 1997, p. 4). Changes designed by DWAF to cope with the inequalities of the past policies pertaining to the riverine resources and non-dominant groups are described in the following paragraphs.

3.4.4 Legal Changes for Equity and Sustainability

Democracy has challenged the former dominant water management ideologies and approaches, as many of the problems that are experienced today have their origins in the past water law and its historical development (DWAF, 1997). The focus of this discussion centres on key steps concerned with: (1) equity and sustainability, (2) water supply, (3) towards Integrated Water Resource Management. These issues have featured prominently since 1994 through the revision of South Africa's water policy, namely the (WISA, 2000):

- White Paper on Water Supply and Sanitation (DWAF, 1994)
- Discussion document Water Law Principles (DWAF & WRC, 1998)
- White Paper on a National Water Policy for South Africa (DWAF, 1997)
- New Water Services Act (RSA, 1997)
- National Water Bill submitted to Parliament (DWAF & WRC, 1998)

To ensure equity, the rights to water in water legislation are no longer bestowed on the landowners of riparian zones. Rather, DWAF assumes the role of the custodian of riverine resources and “has a national responsibility to ensure that both the basic (survival) needs of the people are met, together with those additional needs for water to sustain the current needs of users and the anticipated growth in the national economy” (DWAF & WRC, 1996, p.14). Some of the recent approaches to river management in South Africa are:

- To ensure that equity is balanced with sustainability the current legal proviso has enforced the concept of the ‘Reserve’ which is “the amount of water needed to supply basic human needs and to protect aquatic ecosystems in order to ensure ecologically sustainable development” (DWAF & WRC, 1998). The concept of sustainable development here is not clear and is assumed to be eco-centric and dominant as it is imposed from outside. The Reserve represents the only ‘right’ to water. The purpose of the Reserve is to protect the water resource at a level requisite with the goods and services required by stakeholders. The decision on management class is derived through negotiation with stakeholders, but setting the Reserve itself is based on ecological knowledge and principles. The way the process is carried out at present tends to come from a dominant orientation, and could be made more participatory (Rowntree, pers comm., 2001).
- The white paper "Water Supply and Sanitation Policy" (DWAF, 1994) views water in a holistic framework; likewise it is important to view the whole river as an "indivisible" resource. A water resource can be defined as follows: “A water resource includes the three components of habitat (sediments, In stream and riparian), aquatic biota and water, as well as the physical chemical and ecological processes which link these components of the aquatic environment (DWAF & WRC, 1996, p. 2).
- The impetus for sustainability, "some for all, for ever" (DWAF, 1999, p.1) has resulted in a “national responsibility to ensure that both the basic (survival) needs of the people are met, together with those additional needs for water to sustain the current needs of users and the anticipated growth in the national economy” (DWAF & WRC, 1996, p. 14). Thereby, the Department's legislation acknowledges both developing communities and the natural environment as high priority resource users and it also remains intent on not hindering the development of the nation's economic growth (Economic Project Evaluation report, 1994).

3.4.5 Integrated Water Resource Management (IWRM)

Conely (1995) states that the concept of IWRM has received worldwide attention as a concept to promote the sustainable utilisation of resources. Conely’s paper outlines that future resource allocation and environmental management cannot be accomplished effectively without integrated, international efforts. It therefore implies that coordinated planning and action are required at all levels, across artificial

boarders, from bilateral and multi-national partnerships to national government and through provincial authorities to individual landowners. Therefore, the concept of 'stakeholders' is key to IWRM which Scott (1999, p.1) defines as "all parties (social groups or individuals), who have an interest in, or are affected by, the impacts on the social and/or biophysical environment of a particular development. They therefore have a stake in the issues".

This approach emphasises that resources must be viewed holistically in terms of the whole catchment, or an integration of its sub-catchments, as the management unit. A catchment management approach implies that water and associated land resources will be managed in harmony so as to gain the full benefits of multipurpose use and to co-ordinate the activities of various agencies and other bodies involved in water resource utilisation and protection (DWAF & WRC, 1996). Central to this approach are the relationships between land use, water and affected people (Conely, 1995).

DWAF's current water legislation concerning IWRM occurs at the catchment and local level through relevant formal structures, namely Catchment Management Agencies (CMA). The CMA role is to manage the water resources within its Water Management Area (WMA). WMA are "large-scale contiguous regions of the country, defined by macro-hydrological boundaries, which provide the focus for national water balance planning under the 'National Water Resources Strategy'" (DWAF & WRC, 1998, p. 4). Unless this is framed within the context of participatory processes it is unlikely to result in sustainable outcomes. At present there is only one CMA in existence.

At the more local level of, for example, the tertiary catchment, the formation of a non-statutory Catchment Forum (CF) is being encouraged as a platform for local involvement in resource management. At the same time, irrigation boards are being transformed into more inclusive Water User Associations (WUA), statutory bodies with DWAF approved constitutions responsible for managing the water resources of a particular area (Motteux, 2001).

3.4.6 International Changes

The South African water law review process did not occur in isolation. Similar processes have taken place in other African countries, Europe, North America and Australia (DWAF & WRC, 1996; WISA, 2000). In addition, the conferences leading up to and conventions resulting from the 1992 UNCED influenced the formulation of water management, namely: UN Conference on the Human Environment of 1972; the International Drinking Water Supply and Sanitation Decade Launch of 1977; the World Conference on Water and the Environment of 1992; the UNCED Earth Summit - Agenda 21 of 1992; the Drinking Water and Environmental Sanitation Conference on the Implementation of Agenda 21 of 1994; the Global Water Partnership meeting of 1996; and the First World Water Forum of the World Water Council, 1997 (DWAF, 1997). Through DWAF's commitment to learn from these about water

management within and outside the borders of South Africa they became aware of the need to support policy development, institutional reform, and capacity building. With this they believed that it is important to “use water and water policy as a focus for healing and cooperation rather than as a source for conflict and tension” (DWAF, 1997, p. 11) and became committed to adopting and promoting the Sustainable Development of Agenda 21 (WISA, 2000). As stated in the report of the Catchment Management Workshop that “South Africa’s efforts to establish catchment management are not only in line with global wisdom, but in many cases helping to define it. Catchment management is the best - indeed the only - way to manage water resources to meet the needs of the society in a sustainable way into the future” (WISA, 2000, p. 5).

South Africa is a ‘signatory’ to the Southern African Development Coordination Conference (SADCC) multilateral protocol relating to water resources. Conley's (1995) conference paper highlights that the first Protocol that SADCC agreed on pertains to water. Water management and development is a priority in shared river basins between neighbouring states with the need to ensure both the water reserve and to meet water obligations (DWAF, 1997). This highlights the policy imperative underlying support for IWRM in South Africa.

3.5 Opportunities for South Africa Riverine Management

This section views the broad restructuring of apartheid in the national transition process. In this context, I will highlight some of the features of apartheid that still “hang like a dark cloud over the new ‘rainbow nation’” (Levin & Weiner, 1997, p. 5). This section demonstrates the need for South Africa to evolve from the dominant to the participatory orientation through incorporation of indigenous knowledge and the joint understanding of the various stakeholders in riverine management through participatory approaches.

Despite South Africa's ‘transition’ into what has been termed a “post apartheid era” ... systematic inequalities and deep social consequences of apartheid continue to plague the country's efforts to rebuild it (Constas 1997, pp. 682-683).

The above excerpt provides a frightening picture of South Africa's transition process that suggests an on going risk of socio-cultural breakdown. Some people believe that the environmental crisis facing South Africans may provide a unifying force, which will cut across cultural and ideological divides - a hope based on the assumption that people may realise that if they do not work together to tackle the ecological crisis, they will perish together (Ramphela, 1991). The need to conserve cannot occur in isolation in a participatory orientation. It requires the joint efforts of the conservation managers and the multiple stakeholders (multi-users) to investigate the system's “capability of supporting and maintaining a balanced, integrated, adaptive community” (Woodley, 1993, p. 157).

Apartheid and its heritage has displaced the traditional knowledge skills and abilities that are necessary for coordinating environmental monitoring and assessment between communities in the participatory orientation. Decision making about environmental programs, matters and laws have historically been removed from affected non-dominant parties (DWAF, 1997) and the conceptualised plans formulated at the national level relied on percolation down to the lower levels (Mukherjee, 1993). This lack of communication and negotiations, characteristic of the dominant orientation, led to a situation of disempowerment of non-dominant groups due primarily to a build up of mistrust, anxiety and the lack of shared knowledge between the different groups. Consequently, all communities shy away from open, interactive communication and tend to feel inhibited from expressing their views openly (Mukherjee, 1993). The understanding of rural African communities' systems of conservation and their environmental perceptions can help bridge the communication gap between "resource managers and rural communities, through the former knowing what action to take and allowing local communities to become active subjects in managing their river" (Burkey, 1993, p. 55). Of critical importance within this context is the need to understand the appropriateness of traditional coping strategies and to investigate if they are environmental sustainable. A positive shift is needed away from compartmentalised decision making and top-down approaches towards participatory methods to achieved sustainable environments and effective partnership, participation and integration and empowerment between and amongst the different groups (Motteux & Rowntree, 1998).

The way forward to the effective implementation of sustainable environments is through participatory planning and implementation methods and community sensitisation approaches that have been widely used in Third World contexts (Chambers, 1992a). The Reconstruction and Development Program (RDP) was used to implement the reconciliation and reconstruction policies of the post apartheid government. The RDP and the Government papers that heavily influence water resource management have attempted to address this situation (WISA, 2000). The rhetoric of the new programs is based on a participatory orientation but their delivery frequently remains rooted in the dominant orientation (Motteux, 2001a). Their approach to development focuses on: 1) working from below: being people centred; 2) meeting people's immediate needs; 3) people-driven processes; 4) people part of decision-making, implementation; and 5) developing our human resources (DWAF, 1997). However, in 1996 DWAF and WRC both recognised the lack of appropriate experience, guidelines, or handbooks in ensure "participatory catchment management"(DWAF & WRC, 1996, p. 31).

In circles of development, dominant 'top down' approaches have been largely abandoned and there has been a move to the participatory orientation (WISA, 2000). Participatory approaches, unlike earlier philosophies, recognise that indigenous people are capable of identifying and expressing their needs and aspirations themselves and in their own way, such that the role of the practitioner is that of a listener,

learner, catalyst and facilitator. This increases self-esteem and confidence on the part of the researched, enabling them to reflect, explore, explain and motivate themselves towards action in formulating future community plans (Chambers, 1992a, Motteux *et al.*, 1999b).

Against this background, it is important to recognize that the South Africa's strive towards a transformation needs to acknowledge the value in indigenous knowledge in environmental management, the importance of communication, and the need for all groups to work together towards the sustainable riverine environment.

3.6 Conclusions and Reflections

The research conducted for this thesis adopts the participatory orientation and an eco-centric ecological paradigm. Core themes identified in this literature review through understanding the different environmental and development orientations, are:

- traditional scientific and regulatory approaches rarely result in effective resource management;
- environments often degrade when science is relied on without acknowledging other values and costs;
- governments are starting to reflect public concern through policies and regulations to manage water and other natural resources, whilst also recognising the central role of people in solving these problems;
- participatory approaches are evolving that recognise the integral role of local communities and resource users in the management of natural resources; and
- in South Africa additional change resulted from reconciliation and removing apartheid with consequent changes to ownership, access and management responsibilities for natural resources.

3.6.1 Environmental Orientations can be Participatory or Dominant

As stated in the introduction of this chapter, the anthropocentric or eco-centric orientations can be used either in a dominant or participatory orientation. For example, the recent approaches to river management in South Africa subscribe to ecosystem-based approaches that also recognise basic human needs. This demand for redistribution of water flows and habitat care for the sake of the environment with a belief that resources should provide for basic needs of all falls into an eco-centrism approach that requires constraint on stakeholders behaviour to maintain environmental needs which is called the Reserve. The Reserve can be applied using dominant tools such as rules and regulations or participatory tools where the various stakeholders are involved and are part of decision making. What is more, the determination of the Reserve, an eco-centric approach, relies on science and technology to provides a core foundation for advising on the class of the river. This can translate into the scientist being right and the stakeholders being excluded. This illustrates how the anthropocentric and eco-centric ecological paradigms could be used in either the participatory or dominant orientations of development.

3.6.2 Choosing an Orientation

The human cultural landscape is our written autobiography, reflecting our tastes, values and aspirations (Khan, 1990, p. 38)

The above excerpt highlights the complexity of human culture and how it impacts on the environment. The bio-physical environment which contains many factors all influencing how people choose to manage natural resources. This complexity must be better understood if IWRM in South Africa is to improve. Critical in the examination of IWRM is the origins of the environmental crisis that are firmly grounded in the environmental and development ideologies. These ideologies form the basis of the shared practices, values and assumptions of riverine managers that impact on the contemporary environment throughout the world and in South Africa. In this review I have provided a context to understand the costs to the environment of the dominant orientation's hidden or 'shadow side' through presenting the dominant orientation and its underlying values, beliefs and practices. I also review the shift in thinking in contemporary development and environmental management literature towards a participatory orientation that works with people to cultivate ecological consciousness.

I have reviewed the emergence of the dominant orientation in environmental management that resulted in racial inequality and gross discrepancies between the groups in South Africa. Orientation developments at the worldwide level often influence South African ideology. Within the South African context, apartheid and colonialism have further heightened the powers of people promoting the dominant orientation. This has resulted in disempowerment of local communities; the lack of understanding, communication and trust between resource managers and local communities; and the lack of active riverine management; the lack of appropriate experience and guidelines to ensure IWRM is informed by participatory thinking.

I sketched the post-apartheid drive towards a new approaches and democracy in IWRM, towards legal equality, participatory orientations and approaches. I detailed PRA as an example of methods used to realise a participatory orientation (Chambers, 1992a).

3.6.3 The Global and National Shift from Dominant to Participatory Orientations

I have noted three pivotal transitional shifts that influenced my project. I feel that these transitions are powerful in that they have a large effect on all people-environment relationships and the development orientation. The three pivotal transitional shifts are:

- The global transition from dominant orientation to participatory orientation and from anthropocentric to eco-centric ecological paradigm regarding the management of natural resources. *Caring for the Earth* (See Table, 3-2), argues that (IUCN, UNEP & WWF, 1990 in Fien, 1993, p. 4-5):

What is needed is a fundamental transformation of people's attitudes and practices ... Only a New World view and morality can change the basic relation of people to the earth. People's behaviour is a matter of choice based upon values ... The need for a world ethic of sustainability - an ethic that helps people cooperate with one another and nature for the survival and well-being of all individuals and the biosphere - could not be greater

- South Africa's transition from dominant orientation to participatory orientation regarding sustainable livelihoods. Development is not about the delivery of services to a passive citizenry. It is about active involvement and growing empowerment (ANC, 1994b).
- The South African transition from dominant orientation to participatory orientation regarding management of riverine resources in South Africa. Department Water Affairs and Water Research Commission, argues that (DWAF & WRC, 1996, p. 9):

Now it is accepted that the principles of people centred approaches will form the basis for water resource management in South Africa.

3.6.4 Reflecting on the Role of Literature in my Research Journey

Literature is one of the resources used on my journey of learning. I started with a traditional literature review, which in a separate section frames the subject of a thesis (Lotz, 1996). This literature sought to be a 'container' or a 'framework' for the research at the start of my research journey. It stood as a means to inform me of the road ahead and thus protect me from being blinkered by great complexities (Lather, 1986). However, as I learnt more about participatory theory I realised that literature was a continuous and evolving resource to be used throughout a process (Lotz, 1996). Accordingly, this literature review evolved throughout my implementation of field work - reflecting the ongoing need to engage with 'complexities' of the research journey and to ensure the "constant mutual interrogation between self and theory" (Lather, 1986, p. 267). In the research sections, a reciprocal relationship between theory and practice gradually starts occurring for reasons given by Lather (1986, p. 271):

Our empirical work must operate within a conscious context of theory building. Where are the weak points of the theoretical tradition we are operating within? Are we extending theory? Revising it? Testing it? Corroborating it? Determining that constructs are actually occurring, rather than they are merely inventions of the researcher's perspective, requires a self-critical attitude toward how one's own preconceptions affect the research.

At the start of the literature review I wanted to be objective with what I read, how I interpreted it and how it influenced my views, so as to acquire objective knowledge. However, "there is no single, legitimate way to make sense of the world. Different ways of seeing give us different worlds. Different ways of saying allow us to represent different worlds" (Eisner, 1992, p. 14). In light of Eisner's (1992) statement, I acknowledge that my own perceptions. Eisner (1992) states that my subjectivity was a likely

outcome: “To be objective or to do an objective study is to be or do something that is not primarily about ourselves, but about world itself” (p. 10). As can be seen below from my personal diary recording that explored these concepts (Motteux, Personal Diary, 1997):

The landscape that I travel is informed by many voices: the written text, talks, supervisors, friends, discussions and my knowledge. These present voluminous narratives that I engage and grapple with to find direction in my research journey. In this seemingly endless data overload filled with multi-meanings my own voice and feeling are still alive. The research is full of ‘voices’. However, I am not detached, I am part of the process and thus I recognise that I am subjective. Objectivity is an illusion. My exploration is value-bound.

Fien and Hillcoat (1996) state “that our subjective views are not only internally constructed but also influenced by persuasive social forces. In other words, individuals or groups cannot be considered separately from their societal context” (p. 27).

"The attempt to produce value-neutral social science is increasingly being abandoned as at best unrealisable, and at worst self-deceptive, and is being replaced by social science based upon explicit ideologies”(Hesse, 1980, in Fien & Hillcoat, 1996, p. 30).

4 Philosophy

4.1 Introduction

This chapter sets out the philosophical foundation for the results presented in chapters 6 to 9 by framing the philosophical orientation of the research, the methods related to this orientation and the emergence of this through the research process. It stands as a foundation upon which to understand the research and can be continually referred to through reading the text. This chapter describes the challenges of extracting me from the dominant, positivist orientation and my struggle towards an alternative mode of understanding and research that would allow my work to take place within a participatory orientation. These concepts are introduced in Chapter Three.

In order to explore the concepts central to a discussion around a shift in orientation, I begin by briefly reviewing current geographical philosophy and comparing the central assumptions of the dominant orientation with the participatory orientation in Section 4.2. This is followed by a review of PRA principles as well as other schools of thought that impacted on the research process: Action Research and Theatre for Development. With this in place, I move onto a critical analysis of the shift that took place in my underpinning orientation over the three research phases. As mentioned above, this shift was initially marked by ‘unconsciousness’ on my part, and thereafter by growing insight. The attendant impact of this on both the starting point of the research as well as its progress is also evaluated.

Section 4.4 provides a detailed reflection of my practical experience of the debate around philosophical concerns and orientation, and the influence these exercised over the research process. This review draws on the dominant and participatory assumptions presented in Section 4.2 to trace the evolution of the thesis. The evolution shaped by the influences of both the dominant and participatory orientation starts with my personal orientation preferences prior to this research; the influences of the academic environment in which I worked; the period of confusion in the early stages of my thesis, and reflection and change. This process set a new path for the research that sought to understand how participatory concepts and themes direct research methodologies that can be applied to encourage behavioural change and increase the confidence of local people for sustainable management and rehabilitation of riverine area in the Kat River Valley.

4.2 Examining Dominant and Participatory Orientations

4.2.1 Philosophical Orientation

As introduced in Chapter Three, orientation is the philosophical framework that guides research activity. Griggs (2000) points out that prior to late 1960s geographers ignored the philosophical framework that underpins geography. Philosophy is inherent to any claim to knowledge therefore geographers need to understand their philosophical position. As it is within the philosophical orientation used to frame a research question, objectives are selected and particular methods of data collection and analysis are applied. Therefore, the adopted orientation forms the basis of, and influences, the research. Manen (1990) explains orientation as “prefiguring what is to count as appropriate research topics, appropriate research questions, and even appropriate research outcomes” (in Fien & Hillcoat, 1996, p. 29) by different schools of philosophy in geography and other disciplines.

Each orientation has a particular conceptual framework for understanding the world which guides and influences research activity. Greggs (2002) states that there are many philosophical orientations within geography, some of which are:

- Naive realism – where assumptions are based within the dominant orientation. This school believes that knowledge exists through human experiences and senses without having to account for how human minds process and select knowledge. Repeated observations of a circumstance lead to accumulation of knowledge until a perfect understanding is achieved.
- Logical positivism - which assumes a dominant orientation. This school shares the belief that a philosophy exists prior to data collection and that knowledge is derived through the experience of reality. Knowledge is derived through hypothetico-deductive methods to arrive at a proposition or hypothesis by formal logic upon which guiding philosophy or principles can be deduced through repeated testing. Knowledge is obtained through experience of reality and not the objective world.
- Behaviourism – with assumptions that straddle the dominant orientation. Behaviouralism asserts that humans do not always make decisions according to universal laws. Decisions are often based on incomplete knowledge. Knowledge is gained through human experiences and not through the objective ‘real’ world. The school assumes that through observing the behaviour of human being that they can infer and determine human actions through cognitive, attitudinal and perceptual studies.
- Humanism – with assumptions that shift away from the dominant orientation’s notions of objectivity, abstraction, reduction, formals and separation of subject and object. The humanistic school believes that knowledge is acquired through human experience of the world, that includes their values, emotions and meaning.

- Post modernism – in which the assumptions of the dominant orientation are rejected. Postmodernism claims that there is no single state of existence. Instead there are multi-realities that are in a state of flux. Grand theoretical frameworks are rejected since what is known is relative to the knower. No one human being's story can be privileged above another. It is through the deconstruction of numerous texts that the multiple discourses can be established to provide information of human actions.

Following Greggs (2000) call for geographers to select and review the philosophical orientation of their research, I selected a post-modern philosophy for the research in this thesis, but included elements of Humanism and Local Positivism during Phase One. I now outline in-depth the dominant and participatory orientations, which greatly influenced this research.

The dominant and participatory research orientations are based upon very different sets of assumptions concerning theory, method and procedure (Lincoln & Guba, 1985; Carr & Kemmis, 1986; Fien & Hillcoat, 1996; Kuiper, 1997; Greggs, 2000). I turn first to the dominant orientation because this is so pervasive in the design and implementation of research despite the weaknesses it has where local people are concerned.

The dominant orientation is rooted in positivism and is characterised by objective study and its extractive nature. These tend to create a barrier between the researcher and local community stakeholders that are the subjects of the research. Hesse (1980) cites the three most important assumptions underlying positivism to be “naive realism, belief in a universal scientific language, and a correspondent theory of truth” (in Lincoln & Guba, 1985, p. 24). Stocking (1987) proffers the following critique of positivist assumptions:

It would be good to believe that science is fact and that measurement is right. Indeed, so tempting is the thought of the neutrality of science (and the objectivity of measurement) that many who should know better – scientists for example – believe it, and those not in a position to judge believe it too. The white-coat syndrome is a powerful force, and nowhere is this truer than in the presentation of results of experiments and programs of measurement. Measurement, however, is not an isolated process. First, somebody has to decide to do the measurement; set a working hypothesis for the measurement to test; choose a set of methods; arrange a sampling program and people to do the sampling; analyse the result and use judgement in the interpretation of these results; and decide how those results should be presented and to whom. Then there is the recipient of the measurement who puts the data into context (or rejects them entirely) and who has to make value judgements as to the worth and applicability of the information. Finally, there is

the end-user of the measurement; the person who makes the decisions, who bases a course of action on the results so presented. All these people have their preconceptions, misconceptions and ideologies. Therefore, measurement is never neutral, never a pure service for science or policy (Stocking, 1987, p. 49).

A participatory orientation promotes the production of collective analysis and thus collective knowledge. Participation in this context means empowering local community stakeholders to share in the journey and resulting knowledge of a research process with the researcher. It implies a relationship of giving and taking between participants and researchers. It allows both parties to enter into a relationship to make choices and influence outcomes. Knowledge is embedded within a range of contexts – socio-economic, historical, political and environmental. Since the idea of ‘one truth’ is rejected, a participatory orientation seeks to elicit knowledge by assisting participants to reach an understanding of their strengths, problems, abilities and resources. The aim of this process is to enable positive action. The methods are flexible and rest on continual reflection and evaluation. The researcher is not excluded from this process and is therefore accountable to the participants (Jackson & van Vlaederen, 1994).

4.2.2 Dominant and Participatory Assumptions

Orientation underpins and shapes the methods chosen and how they are used (Fien & Hillcoat, 1996; Janse Van Rensburg, pers. comm. 1998; Motteux, 2001). The selected orientation consists of a series of assumptions that differ from those of alternative orientations. This also influences how methods are used, but not necessarily which methods are used. For example, a questionnaire is not necessarily inappropriate in participatory work simply because it is a tool traditionally used within the dominant orientation for purely extractive, quantitative purposes. Because orientation affects how methods are used, it is quite possible to use questionnaires in a wholly participatory manner and, conversely, to manage a ‘participatory’ workshop in a top-down, authoritarian style that fails to achieve true participation.

It is for this reason that a judicious and thoughtful consideration of the philosophical orientation that underpins one’s work as a practitioner is so vital. The best intentions in the world are no protection against producing work that is not empowering and does not lead to real change ‘on the ground’. This is, of course, an enormous challenge (Janse Van Rensburg, pers. comm. 1998).

Further, it is important to acknowledge that engaging with a participatory orientation is not merely a collective exercise. On the contrary, practitioners are challenged to work with completely new ideas based on “different – indeed, sharply contrasting – assumptions” (Lincoln & Guba, 1985, p. 35). Consequently, what is required is “transformation, not an add-on” (Lincoln & Guba, 1985, p. 35). Since

the object of my research is evaluating people-environment relationships to bring about sustainable riverine management, the participatory orientation provides a much more powerful way of getting local community stakeholders involved.

The following list of assumptions, comparing the dominant and participatory orientations, is designed to clarify these complex and crucial issues. These assumptions are informed by the work of Chambers (1992a), Lincoln & Guba (1985), and my own experience.

Assumption 1: The researcher's perception of learning

- **Dominant Orientation:** The focus is on 'intellectual growth' in a dualistic relationship that presumes that the researcher is a scientist first and a human being second, i.e., there is no 'personal' growth expected or required.
- **Participatory Orientation:** The researcher is a 'co-learner' with the participants. The researcher grows both intellectually and as a person through her/his self-reflexive engagement with the work. This is considered a personal responsibility.

Assumption 2: The Researcher's Relationship to Data Collection

- **Dominant Orientation:** Research is data focussed, the use of which is understood to be primarily for the researcher. The data is analysed and presented by the researcher and is, in the short term at least, for the researcher's benefit.
- **Participatory Orientation:** The researcher is concerned with facilitating participants to examine, question and understand their own information. The collective nature of this inquiry and its subsequent interpretation provides an opportunity for participants to actively influence both the research process and their lives.

Assumption 3: The Research Design

- **Dominant Orientation:** Research is undertaken in a linear manner towards the achievement of a research product. The work is bound by the aims and objectives constructed by the researcher. Commonly, the trajectory of the work is as follows: undertaking a literature review; conducting one's research; analysing the data; and writing up. Findings are considered identifiable and are often presented as a 'found product', for example, rural people care/do not care about river resources.
- **Participatory Orientation:** Research evolves as it responds to the personal, political, socio-cultural, and historical needs of the participants, the researcher, and the country in which it takes place. Continuous self-reflection as well as the negotiated aims guide the research and objectives intended to enable change. There is recognition that learning is gained from the process itself and that this is a worthwhile enterprise.

Assumption 4: The Research Mode

- **Dominant Orientation:** Research problems are conceptualised narrowly. Issues that fall outside of the bounds of the stipulated area of inquiry are considered irrelevant. The goals are determined by the researcher's needs.
- **Participatory Orientation:** The focus of the proposed research is jointly conceptualised and negotiated with the participants, i.e., drawing up overall goals. Within these, the participants and researcher may include other short-term goals. These should contribute, in the long-term, to obtaining the overall goal. Throughout, the focus is on negotiation and continual reflection on the participants' and the researcher's needs.

Assumption 5: Ontology¹⁰

- **Dominant Orientation:** Traditionally, research is written up in the third person. This seeks to present the idea of objectivity; the 'value-free' researcher. Thus, while the research has been directed from the 'I' – in everything from selection of the problem to choice of method to interpretation of results – this is denied by the use of dislocated, clinical, third person speech.
- **Participatory Orientation:** While doing the work and the final writing up, it is acknowledged that it is not possible to decontextualise either oneself or any of the participants. Essentially, there is no such thing as value-free objectivity. Since this is a given, it is expected that the researcher be open with the assumptions, personal and professional motivations, aims, needs and expectations that s/he brings to the work. Thus the researcher recognises his or her subjectivity and the existence of many truths. In this, Carr and Kemmis (1986) point out that the critical researcher needs to acknowledge that there may be aspects of social situations that cannot objectively be influenced by those affected by that situation. In such instances, individuals may perceive the circumstances to be 'utterly unalterable' and consequently perceive themselves to be 'powerless', and this can constrain action. A participatory orientation offers methods with which such self-defeating (and often, entirely understandable, given historical and socio-economic factors) perceptions can be changed and thus assist in empowering people within the context in which they live and work.

Assumption 6: The Research Context

- **Dominant Orientation:** The work is decisively selected and framed through considering possible constraints: space (it must be accessible), seasons (it should reflect 'good' seasons) and wealth (it assumes avoidance of poverty). The data gained is extracted out of the socio-economic, political and historical contexts that constitute and inform the participants' lived realities.

¹⁰ Ontology refers to "philosophical assumptions and ideas about the nature of existence" (Griggs, 2000, p. 9)

- **Participatory Orientation:** The work acknowledges the necessity of context and the many and conflicting forces of politics, history and culture and socio-economic considerations that constantly affect it. It is understood that research cannot be separated from these contexts.

The above list has been influenced by the work of Lincoln and Guba (1985). The comparison between dominant and participatory orientations presented in Table 4-1 is modified from Lincoln & Guba, 1985, p.37 and serves as a concluding summary.

Table 4-1 : Comparison between Dominant and Participatory Orientations

Axioms About:	Dominant Orientation:	Participatory Orientation:
The nature of reality:	Reality is single, tangible, and fragmentable.	Realities are multiple, constructed, and holistic.
The relationship of knower to the known:	Knower and known are independent, a dualism.	Knower and known are interactive, inseparable.
The possibility of generalisation:	Time- and context-free generalisation (nomothetic statements) are possible.	Only time- and context-bound working hypotheses (idiographic statements) are possible.
The possibility of causal linkages:	There are real causes, temporally precedent to or simultaneous with their effects.	All entities are in a state of mutual simultaneous shaping, so that it is impossible to distinguish causes from effects.
The role of values:	Inquiry is value-free.	Inquiry is value-bound.

Fien and Hillcoat (1996) state that “research methodologies are very much a puppet of their underlying assumptions” (p. 1). Such assumptions, influenced by orientation, are made by the researcher, and influence how researchers understand their work, and how they seek to actualise it. These assumptions are not static entities that remain concrete and easily identifiable throughout the research process. On the contrary, they are multiple, obscure and continually shifting (Burt, pers. comm., 1998; Gough, pers. comm., 1998b). As a researcher working in a particular context and bringing a range of beliefs, aims, conceptualisations and perceptions to bear on that context, my assumptions affected the research process in the following ways as detailed with reference to my own research:

- The research was influenced by my initial choice of a research proposal, the methods used and, ultimately, the conclusions drawn.
- The research was influenced by my choice of the substantive theory utilised to guide the collection and analysis of data and in the interpretation of findings.
- My research was affected by the values inherent in the context.

These influences and effects are explicitly acknowledged in the participatory orientation, but are rarely acknowledged and only implicit in the dominant orientation. As my research evolved, I grew to understand the importance of explicit acknowledgment of my personal influence and assumptions and their influence on the research.

The initial selection of a research proposal, the methods used and the analyses drawn were, in many instances, not congruent with a participatory orientation, and were a function of the influence of an underlying dominant orientation. I am now able to see that the original conceptualisation of the research question, the methods used and the analyses done were often in conflict with each other. This necessarily confounded my work and engendered a real sense of frustration and confusion. Nevertheless I was, and still am, heartened by Chamber's (1992a) observation that the processes of participatory work are less about never making a mistake, and more about being open to one's failures and learning from them.

4.3 Guiding Philosophies used with a Participatory Orientation

4.3.1 Common Ground

Participatory research incorporates a broad family of guiding philosophies that began to emerge in the late 1970s (Chambers, 1992b). My research utilised Rapid Rural Appraisal (RRA), Participatory Rural Appraisal (PRA), Action Research, and Theatre for Development. This list is by no means exhaustive of the range of possibilities within participatory research.

4.3.2 Rapid Rural Appraisal (RRA)

RRA developed in the late 1970s and was among the first alternatives to the dominant orientation of research work. RRA makes use of a range of tools and methods to quickly record and explicitly acknowledge local knowledge relating to a particular opportunity or problem with the owners of the local knowledge. Its express intent was to bring outside researchers and local participants together and its underlying reason lay in the following:

- the great need to accelerate rural development and enhance change;
- the necessity of developing methods to obtain up-to-date information in a cost-effective and less time-consuming way (this involved a shift from using lengthy questionnaires);
- the recognition that rural people are knowledgeable about many subjects that affect them, and have "indigenous physical, technical and social knowledge" (Chambers, 1994b, p. 8); and
- the acknowledgment that, most information gained from rural areas was collected on brief visits, in 'good' seasons and from wealthier groups rather than the very poor (Chambers, 1992a).

Despite the fact that RRA is focussed towards a more inclusive mode of working, many of its central tenets are still aligned to concerns characteristic of the dominant orientation. For example, while RRA is generally used within efforts that respect the value of local knowledge, emphasis is placed on the information elicited rather than on the process of knowledge construction and its potential to evoke change. Thus there is still a concern with information for 'its own sake', extracted from the community for use by 'expert' others. As Chambers (1992b) points out, despite the acknowledgment of the value of local knowledge, within RRA the intent is to put such knowledge to use for the benefit of an outsider's analysis. Thus, within RRA, an outsider still determines the agenda, extracts the information, analyses it and applies it (Chambers, 1992b). For this reason RRA was developed further by Chambers and others into Participatory Rural Appraisal (PRA)(Chambers, 1992a).

4.3.3 Participatory Rural Appraisal (PRA)

PRA is an evolving ensemble of approaches and methods which have been influenced by a number of schools of thought including: Activist Participatory Research; Agroecosystem Analysis; Applied Anthropology; Field Research on Farming Systems; and Rapid Rural Appraisal (Chambers, 1992a, 1994c). In essence, PRA methods and approaches are "suited to the understanding and expression of local diversity, and to enabling local people to assess, analyse, cope with, adapt to, and exploit accelerating change" (Porter, Allen & Thompson, 1991, in Chambers, 1994a, p. 1449).

PRA requires the practitioner to be self-reflective, critical and open not only in their own work but also with their fellow practitioners, so as to ensure that participatory approaches are, and continue to be, flexible, adaptable and innovative (Chambers, 1994a). PRA embraces participatory research as a method through which to deepen understanding of participants' lives, with the assistance of the participants themselves (Chambers, 1994b). Gaining such an understanding serves to foreground the fullness and significance of participants' knowledge, in order to facilitate community engagement and change.

This thesis was framed within the principles and assumptions of PRA, as well as related participatory philosophies such as Action Research and insights gained from the work of authors such as Boal (1995) and Freire (1972). All these approaches share an empowering belief in participants' ability to understand, negotiate and change their own lives, and are thus focussed on ensuring sustainable development. It is my belief that a combination of approaches such as these is well suited to addressing and healing many of the issues and wounds inherent to development work in South Africa.

Embedded within this eclectic philosophy were a number of central elements. These are listed below and should be understood as a collection of participatory principles, which guided my methods, rather than

prescribed them. In this, I attempted to direct my efforts towards the spirit and sentiment of these principles by internalising them and living them, rather than applying them ‘parrot-fashion’. Explicitly, I attempted to:

- learn from and with stakeholders, directly on-site and face-to-face;
- learn rapidly and progressively, through conscious exploration, flexible use of methods, improvisation, cross-checking, and not by following a blueprint program;
- have respect for stakeholders;
- take an interest in what stakeholders have to say and show;
- have patience, and to restrict interruptions;
- be humble;
- use materials and methods that enable people to express and analyse their knowledge;
- not impose ‘my’ ideas, categories and values, making it difficult to learn from ‘them’, and making ‘them’ appear ignorant when they are not; and
- not impose academic pressures such as the desire for formal statistical respectability, and the compulsion to quantify human beings (modified from Chambers, 1992a).

Community work requires the practitioner to have a large store of courage and resilience. It is vital to be aware that one is also part of the process and acknowledge that the researcher *does* enter the situation with some power. It is productive to acknowledge this through dialogue with all stakeholders, so that the power can be utilised responsibly and effectively.

The success of PRA methods depends on the practitioner’s ability and willingness to engage in “self-critical awareness” (Chambers, 1992a, p.15). This is best defined as an ongoing effort in which a practitioner is “continuously examining their behaviour, and trying to do better. This includes embracing error – welcoming error as an opportunity to learn to do better; and using one’s own best judgement at all times, meaning accepting personal responsibility rather vesting it in a manual or a rigid set of rules” (Chambers, 1992a, p. 15). Furthermore, Chambers (1992a) argues that constructive criticism increases “the rigour and adds to the repertoire of Participatory Rural Appraisal” (p. 51). This is particularly true in a context where the freedom to try and fail is celebrated, and where mistakes are viewed as opportunities for learning and growth.

The practice of PRA requires the following (Chambers, 1992a):

- A reversal of learning - the researcher is able to learn from rural people directly on-site and face-to-face, gaining from local, physical, technical and social knowledge.
- A willingness - to learn rapidly and progressively.

- Resisting conventional approaches - by listening not lecturing, being relaxed and not rushing, probing instead of moving onto the next topic, being unimposing instead of important, and seeking out poorer people to learn about their concerns and priorities.
- Optimising trade-offs - by relating the costs of learning to the utility of information, with trade-offs between quantity, relevance, accuracy and timeliness. This includes the principles of optimal ignorance¹¹: it is better to be approximately right than to be precisely wrong. Getting approximate answers to the right questions is preferable to receiving correct answers to the wrong questions.
- Triangulating - using a range of methods and various investigators and/or disciplines to crosscheck the information.
- Seeking diversity- seeking variability rather than averages. This goes beyond the crosschecking of triangulation, for this process deliberately seeks out, notices and investigates contradictions, anomalies and differences (Chambers, 1992a).

The three basic pillars of PRA are methods, behaviour and attitudes, and sharing (Chambers 1992a; 1994b).

- Participatory methods - seek to facilitate analysis by rural people through the use of maps, diagrams, explanation, planning, monitoring and evaluation. The rural people take on the role of the researcher by undertaking what the researcher has previously done (Chambers, 1992a; 1994b) to complement the role of the researcher.
- Appropriate behaviour and attitudes - in order to enable local people to confidently voice their own knowledge, to carry out their own analysis and to state their own priorities, the proverbial ‘stick’ must be handed over: “the prime actors are the people. The outsider is less extractor, and more convenor and catalyst” (Chambers, 1992a, p. 45).
- Sharing - Chambers (1994b) stresses that sharing has two threads, that is sharing knowledge and sharing experiences, with the former taking the following forms:
 - local people share knowledge amongst themselves of what they have found;
 - local people share with the outsiders. Initially, outsiders restrain themselves from putting forward their own ideas or their reality; and
 - practitioners share their findings with each other and with the local people.

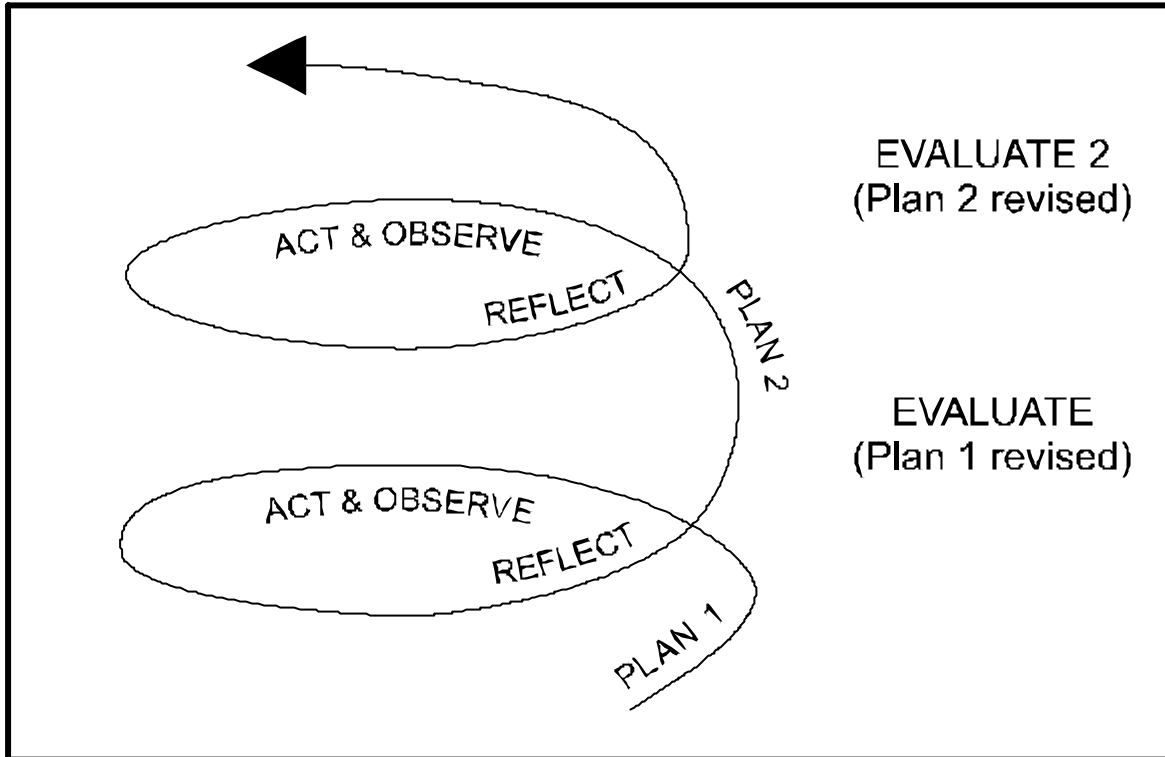
¹¹ “This moves against the tradition of research, against the bias of the education system, and against the drives of curiosity, but is in harmony with the principles that administrative (in this case information-gathering) capacity is a scarce resource, and that in complex situations activities should be optimal not maximal” (Chambers, 1993, p. 19).

Chambers (1994b) advocates that knowledge must be shared willingly with others and that intellectual possessiveness must be avoided. The work is not about owning ideas or methods, it is about sharing them openly. At a broader level, the sharing of PRA experiences allows for self-critical appraisal and permits researchers and practitioners to learn from each other (Chambers, 1992a; 1994b).

4.3.4 Action Research

Action research is a “collaborative social process of learning, realised by groups of people who join together to change their practices through which they interact in a shared social world” (Kemmis, 1995, p. 36). Action research in the context of my research was seen to solve pressing concerns and problems through understanding the local context and seeking to improve the capacity for local people themselves to effectively change their situation. Action research is not about doing the research or collecting information for purposes of writing papers, but it is about setting up forums to improve the social context and to facilitate action. Action research is a reflective process and all participants have an active role and ownership in the process and results (McKernan, 1991). Particularly pertinent to Integrated Water Resources Management (IWRM) and the objectives of this thesis, Action Research can provide “opportunities to create forums in which people can join one another as co-participants in the struggle to remake the practices in which they interact – forums in which rationality and democracy can be pursued together, without an artificial separation ultimately hostile to both” (Kemmis, 1995, p. 36).

From a structural point of view, Action Research is distinguished by “a design consisting of a spiral of cycles of reflection – define a problem, plan action, act, observe, reflect, re-define problem, plan, act...” (Janse Van Rensburg, pers. comm., 1998). Figure 4-1 (after Kemmis, 1995) illustrates this diagrammatically and clearly demonstrates that the purpose of Action Research is to enable change through adaptive management.



Modified from Wals, 1994

Figure 4-1 : The Cycle of Action-Reflecting-Learning

Kemmis (1995) lists the following features that influence and direct Action Research.

- Action research is a social process: it occurs within socio-economic, historical and political contexts with the intent of assisting individuals or groups to strive to uncover how they are and have been formed and re-formed, both individually and in relation to one another.
- It is participatory: it is an approach that seeks to encourage people to examine their skills and values, as well as how they see themselves and their actions in the world. In addition, Action Research enables participants to grasp how their skills, values and understanding shape both their identity and the broader socio-political and environmental structures. This provides a platform upon which people are able to reflect on how their current situation generates action, or, if it does not, why not and how to address this.
- It is practical and collaborative: Action Research enables an exploration of acts of communication and of the creation of organisations. In this, reflection allows for an improvement of interactions by understanding the processes that inform these interactions. It is a process which aims to reduce situations in which people are alienated, dismissed or marginalised, resulting in feelings of powerlessness and a lack of capacity. The practitioner is not excluded from this process. S/He is expected to continually seek to understand and reconstruct her/himself in order to enable communication and change.
- It is emancipatory: it seeks to enable people to ‘work through’ and release themselves from irrational, unproductive, unjust or harmful social structures that limit self-development and self-determination.

Within this process, people are able to explore themselves and their actions in relationship with wider social aspects that may/do constrain them, thus seeking the most constructive ways in which to release themselves from such constraints. Such insight and practical application is vital for all; oppressors too need to learn and change.

- It is critical: oppressive and destructive situations are created and maintained through interactions such as language, modes of work and social relationships. Within such situations, people may experience affiliation and difference, inclusion and exclusion. Action Research sets out to deliberately challenge unjust, alienating and unproductive systems, as well as the power differentials embedded in relating to others.
- It is recursive: Action Research seeks to understand and explore participants' lived realities with the intent of empowering capacity for change. This is achieved through a spiral of cycles of critical and self-reflexive action and reflection. These are designed to help participants learn about their practices, language, modes of work and the social relationships of power in which their practices are expressed and realised. It is a process of learning by doing, and learning with others by changing the ways one interacts in social contexts.

4.3.5 Theatre for Development

This research draws on the works of Boal (1992; 1995) who describes the concept of Theatre for Development as a theoretical tool that enables a situation to be observed and encourages collective exploration and understanding of the problem through dramatic action. Through theatre for development people are encouraged to engage mentally, emotional and physically. In each theatre piece or drama there is a human context that is driven by a tension or conflict that is applicable to the participants. The drama is made explicit in place and time through language and movement to create a dramatic atmosphere (O'Toole & Haseman, 1988). It is through playing out the drama that participants come to understand their position, experience feelings and become actively involved in seeking to solve the issue. Theatre for Development allows participants to view issues from different perspectives and reflect on their own behaviour and that of others. Alternatives to solutions can be played out and found through participants directing the drama (Boal, 1992; 1995).

The rationale for the use of methods such as Theatre for Development is persuasively argued by Chambulikazi in Mloma (1991, p. 157):

There [is] a strong relationship between Popular Theatre and participatory research. Both are committed to the promotion of participation of the members of the community in the development process. Participatory research promotes development through popular education, and it furthers a research philosophy, which aims to increase the awareness of people and to mobilise them for

collective action. Popular Theatre is, therefore, a relevant practice within the Participatory Research process in that it goes beyond research to concretise the findings into a public expression of people's own feelings and it has a follow-up action.

This argument holds particularly true for South African, as the following excerpts from Mlama (1991) demonstrate: "The UNESCO campaign in the 1970s for the use of folk media for development communication in the Third World was based on the realisation of the existence of such media. As such, there are many people in Africa accustomed and exposed to a theatre whose value lies in its ability to express the people's feelings, concerns and aspirations and to portray values and attitudes necessary to the continued well-being of the society" (p. 32) and "for the majority, especially in rural areas, the value of their theatre still lies in its ideological functions" (p. 31). Given Mlama's (1991) emphasis on rural peoples, one of the strengths of Theatre for Development is that it speaks compellingly and constructively to commonalities, to participants regardless of age, gender, race and socio-economic position.

4.4 How Orientation Shaped the Evolution of the Research

This section presents the evolution of my thesis from the dominant to the participatory orientation. It uses the theoretical assumptions presented in 4.2 and 4.3 to understand the influences of the orientation on the research journey and enabling local people to participate in the research.

As I moved through my research process, I became progressively more conscious of implicit assumptions that were directly affecting my ability to work within a participatory orientation. In this slow and fumbling research process I relied heavily on Chambers' (1992) analogy of a braided stream with many branches. Building on this analogy, the following section seeks to uncover the different orientations and assumptions that intermingled to shape the research. The statement "where we look from affects what we see" (Lincoln and Guba, 1985, p. 55) points out that the position from which one observes and how one does so affects the choices made and, thus, the outcomes achieved. This insight is a central theme of this chapter and the thesis as a whole. Through reviewing the assumptions I had learned from my academic training and Honours research, I became better equipped to review the assumptions upon which the research was based, that influenced the ability of the participants to participate in the research. I thus carefully sought to uncover those branches that had fed into my 'research stream' - and identified the following:

- The theoretical approach and concepts dealt with in an academic context discouraged the questioning of the dominant orientation and rarely presented an alternative.
- My Honours research experience was embedded in anthropological assumptions under the dominant orientation.

- Phase One of this research straddled contrasting dominant and participatory orientations. I call this phase my ‘naive and confused phase’ as I was largely unaware of the influence of the dominant assumptions embedded in my anthropological approach towards participation.
- Phase Two marked a period of reflection and understanding the confusion that developed in Phase One.
- Phase Two included active community participation in order to allow me to understand, hear and identify the environmental concerns of communities. I not only used PRA methods in this phase, but more importantly, began to internalise the spirit and sentiment of PRA principles.
- In Phase Three, community action was located within an Action Research framework and was shaped by a critical self-awareness. A shift occurred away from data collection of local knowledge to understanding the elements and assumptions that enable capacity for local people to take charge of their own development.

The following sections outline the philosophical foundation of these influences on the research.

4.4.1 The Academic Influence

At the start of my research journey I gained comfort from the following observation from Lotz (1996): “[On] the first leg of this journey ... I was still an inexperienced traveller with a vague and confusing itinerary” (p. 20). My first encounters with fieldwork were largely influenced by the dominant research orientation presented in my undergraduate and postgraduate studies in the Anthropology and Geography Departments at Rhodes University. Within this, researchers were not required to question the underlying assumptions of their approaches. Participants were seen as sources of knowledge providing data with which to write papers, essays or projects. Research entailed the recording of this knowledge with no benefit going to the community.

4.4.2 My Honours Experience

In my Honours year I was drawn to understanding communities’ perceptions and local knowledge of water use in the former Ciskei. I was motivated to communicate to water resource managers the importance of grasping that water consumption and handling is determined by a range of needs on the part of the individual as well as the social and cultural norms prevailing within that context and resource situation (Motteux, 1995; Palmer, 1997).

Since this work endeavoured to recognise an evolving relationship between the researcher and the participants, and since I made use of participatory observation, group discussions and in-depth

unstructured and structured interviews, my Honours fieldwork could be understood as an attempt to work towards people orientated work. I applied the same thinking and approaches to the methods employed in the first Phase of my PhD research.

Within the course of my Honours research project I also questioned the advantages and disadvantages of both local knowledge and external scientific knowledge for solving environmental management problems. The strengths of rural peoples' knowledge is grounded in the fact that such knowledge springs from daily observation and experience over a sustained period of time (Warren, *et al.*, 1995). The strength of outsiders' scientific knowledge lies in its ability to examine microscopically and measure accurately (Carruthers & Chambers, 1981; Chambers, 1993). At that time, I believed that rural people were less capable of measuring and that, consequently, they would not be able to recognise and observe harmful factors with the naked eye alone. The following quote from my Honours research project illustrates why I believed it vital to do this:

The water collectors acknowledged that the water sources are unprotected and provide poor quality and are susceptible to the effects of dry periods. Drawers' awareness of health hazards attached to surface water results in the seasonal shifts to cleaner sources and the knowledge to protect and purify the collected water. In particular, with regards to water washed disease, diseases do not arise due to the lack of awareness but due to ... the invisible nature of harmful pathogens in the water supply. Therefore, it is important to educate the villagers that sight, smell and taste cannot be used to detect the invisible pathogens in the water supply (Motteux, 1995, p. 18).

From my Honours research I saw the advantages of combining rural peoples' knowledge with 'scientific' knowledge. This was a position that grew from the work I undertook in my Honours year and became a starting assumption of this thesis. To demonstrate this point of view, I quote directly from my Honours research:

In the past planners were "obsessed with technology and thus ignored the beneficiaries. Predetermined and centrally controlled projects without regard to users' beliefs, values, customs and needs are attributed to the massive failure rate of water supplies in developing areas" [Morgane, 1989]. It is vital for planners to consider the following aspects and to realise that they are "as important as the technical and financial consideration in planning for water supply projects" [Morgane, 1989] (Motteux, 1995, p. 18).

My Honours research taught me to value peoples' knowledge and the importance of communicating this knowledge to outsiders, such as water resource managers. I saw myself essentially as the 'voice' of the

community. For I felt that I had the ability to listen, record and understand the local peoples' perspectives and, through academic conferences, had the ability to communicate to outsiders the needs of the community, as well as listen to outsiders needs. In addition, my Honours project revealed that the community people had a wealth of knowledge concerning their handling of drinking water. In that study the anthropological methods were the tools that led to participation and thus I never sought to question my assumptions. It was these understandings that shaped my direction and decisions in Phase One of my PhD research.

4.4.3 Setting Out and Realising the Inadequacies of my Approach

Only the community leaders and the local headmaster had any meaningful influence on the initial research assumptions. The community stakeholders had very little input into what needed be done and who should do it. National needs, as well as those of my funders, PhD supervisors, and the intent of my research proposal shaped research design. My research was conceptualised within an understanding of global and local awareness of the scope, gravity and complex causes of riverine issues, and the attendant lack of experience, guidelines or knowledge of how the environment is understood, valued and used by rural communities (IAWQ, WISA & NPB, 1995; DWAF & WRC, 1996). In discussion with my supervisors and funders, and faced with overwhelming evidence of environmental failure, it was recognised that the following challenge existed: to gain an understanding of the perception and awareness of rural communities' relationship with their environment. In this, it was emphasised that there was a need to understand the actions of rural people within their experience of the riparian zone, and how their actions arose from, and reflected, their experience.

At the start of this research, I was unaware that the research's framework was precariously balanced between two sharply contrasting orientations. Upon reflection, this is clearly evident in my research proposal: for example, the aim 'to analyse and understand how the particular rural community's structures, local knowledge, attitudes and needs affect the riparian zone' was located within the dominant orientation. Yet a concurrent objective was to find people-centred methods that would enable the empowerment of the community and encourage active participation in IWRM. Thus, from its inception, the research was marked by a tension between the participatory and dominant orientations.

The tension between the dominant and participatory orientations was further exacerbated by a pull towards acquiring quantitative data in a linear manner - viewing the village people as 'objects' of the research. Acquiring data in this way assumed that all findings were independent of the researcher due to the 'bracketing' of my assumptions. Another objective was trying to reconcile this with participatory principles in which the researcher is understood to be a part of the process and a co-learner. Such

participatory principles require working within a reflexive design cognisant of one's own biases. The tension was therefore a personal one – between being independent of the process and acknowledging that I was integral to it.

Social anthropologists seeking to uncover the meaning of social situations increasingly use the participatory style of working but still operate within the dominant orientation. This was a major influence on my work. I saw social anthropologists as researchers who were open to recognising and embracing the insight, validity and usefulness of local knowledge. Within this, I believed in the value of immersing myself in the research setting in order to understand better the story of local people. I hoped that tapping into a wealth of local knowledge would help to bridge the communication gap between resource managers and rural communities, assisting the former in deciding which courses of action to take and allowing local communities to become active participants in managing their river (Burkey, 1993).

My initial aim of conveying my findings to water research managers was shaped by anthropological notions and by Chambers' (1992a, 1994c) faith in the richness and validity of rural peoples' local knowledge. In this I held that it was appropriate and necessary that the communities' local knowledge informed decision-making and so I attempted to record as much as possible in as much detail as possible. I was unaware of the extent to which the dominant orientation shaped my beliefs and practices and how this was problematic within an approach that sought to embrace participatory principles. I attempted to work towards a standardisation of data within which I, as the researcher, was the main instrument of data collection, analysis and interpretation through using structured interviews. This negated the inclusion of the participants and frustrated the possibility of their taking an active role in the research process. Moreover, despite my best efforts, the information I collected was value-bound, shaped as it was by my understanding and perceptions of the local peoples' needs and concerns.

In order to establish communication links and working relationships between rural stakeholders and water resource managers I believed that it was first necessary to understand and analyse these two groups' needs with regard to IWRM practices. I began this process with the premise that if rural people were consulted about their perceptions, desires and actions, the danger of inappropriate development could be lessened. Equally, I agreed with Chambers' (1983) suggestion that the genesis of commonality can be found in the act of bringing rural people and resource managers together to communicate, observe and undertake tasks. Essentially, it was assumed that in such contexts, both parties are able to see that "many activities undertaken by rural people and scientists are similar" (Chambers, 1983, p. 93).

I considered that bringing people together could lead to better communication between practitioners and thus speed up the process of identifying communities' needs. However, in attempting to implement this, I encountered stumbling blocks that effectively prevented its realisation - these included the lack of capacity to communicate effectively between different stakeholder groups and the reality that communication alone was not sufficient to evoke change.

There was general agreement among my PhD supervisors, fellow researchers and the funders that an investigation of environmental problems involving human beings is not well suited to an exclusively scientific approach. It was acknowledged that there was a need to move away from a method of working that concentrated purely on producing large data sets, which could be statistically analysed with a great degree of precision. Therefore, the approach identified as appropriate was one in which the actions, ideas, thoughts, priorities, problems and so on of people concerned with environmental management could be captured in a predominantly qualitative manner. Lincoln and Guba (1985, p. 30) support such a shift: "the argument for the new paradigm can be made even more persuasively when the entities being studied are human beings".

With this I was concerned with the need for resource managers and environmental scientists to move from a purely 'scientific' approach to a 'quasi-scientific approach' through understanding rural communities' perception of the environment and their systems of conservation. This concern was explicitly stated in the original aims of my PhD which set out that a synthesis between community-driven methods and scientific approaches would seek to provide an applied development outcome (Chambers, 1983, p. 101):

For such intractable issues, the joint use of professional outsiders' and rural people's knowledge, skills and resources may be the best way forward, combining the precise observations, measurements and experiments of modern science with more extensive and continuous observations of rural informants and experimenters. The two types of knowledge complement each other; and together they may achieve advances that neither could alone.

As discussed above, although my research design in Phase One was explicitly shaped by dominant orientation assumptions (listed in Section 4.2.2.) I was unaware of other less conscious influences that impacted on my research process. For example, I was aware that my training in Anthropology influenced my working and thinking towards tools for encouraging participation. However, I was unaware of the impact of the discussions held with my supervisors, funders, colleagues and friends. Since I did not fully understand community-driven methods and scientific approaches I naively attempted to blend them. With this, although I valued and wanted community participation in the research, I failed to achieve all that I intended and became frustrated.

4.4.4 Phase Two - Time of Reflection and Understanding

It was not sufficient that I simply appreciated the necessity and appropriateness of moving towards working within a participatory orientation. Such a shift required personal growth and change on my part in order to be able to provide a workable and accessible framework in which the community could become a part of the research process. A turning point came while I was preparing a paper for the South African Aquatic Scientists conference, held at Mtunzini in July 1997. While conducting a literature review, I discovered that there was little information in the literature dealing with adults' concepts of their riparian zones, and that water resource managers expressed this lack most keenly.

With this in mind, I used my period of confusion as constructively as possible. I dedicated time to inform my practice by reading widely, attending an Environmental Education methodological course presented by Rhodes University's Environmental Education Unit, and dialoguing with fellow researchers, in particular, Janse Van Rensburg and Burt (1997; 1998). I also set aside time for reading a range of relevant texts (Carr & Kemmis, 1986; Fien & Hillcoat, 1996; Chambers 1992a, Boal, 1992).

It was whilst in this period of reading widely that I discovered Fay's (1975) work on social theory and political practice. The following quote encapsulates his position:

[The interpretivist model] *leads to reconciling people to their social order*, and it does this by demonstrating to them that, contrary to their initial beliefs that had caused the breakdown in communication in the first place, actual social practice is inherently rational. In a situation of social conflict and disruption, the interpretive model asserts that the ensuing anxiety and suffering is the result of misunderstanding which, if cleared away, will restore the flow of discourse and hence order – as if such cleavage and breakdown in communication might not result from the irreconcilable demands, interests, needs, and beliefs of the conflicting parties. In a time of upheaval the interpretive model would lead people to seek *to change the way they think about what they or others are doing*, rather than provide them with a theory by means of which they could change what they or others are doing, and in this way it supports the status quo (Fay, 1975, p. 91, original emphasis).

Fay's (1975) discussion of interpretive social science¹² theory suggests that conflict and escalating tension are a function of communication breakdown and a failure to appreciate a person's identity and world view. This goes to the heart of a researcher's assumption that merely presenting ideas "will foster a

12 Interpretive social science "is a generic term that includes a variety of positions. It can be also be explicated from a variety of different sources, ranging from German hermeneutics to British analytical philosophy" (Carr & Kemmis, 1986, p. 87).

change in the self-conception of social actors”(Fay, 1975, p. 90), a belief which Fay (1975) describes as “naive”. In contrast, Fay (1975) suggests that transformation only occurs when people are provided with the tools they need to make changes to their situation.

This helped me to recognise elements of interpretivist thinking, that draws on both dominant and participatory orientations. It influenced my attempts at participatory research by helping me identify dominant orientation thinking and understand participatory orientation alternatives. Carr and Kemmis’ (1986) work also enabled me to see that I had taken a relatively passive stance towards change by using non-interactive communication in an attempt to engender transformation.

Although I experienced a great sense of relief in finding that my efforts could be characterised within a known orientation, I was also challenged by the knowledge that my work had resulted in no real benefit to participants. Carr and Kemmis (1986) adopt an Action Research philosophy in which it is acknowledged that while it is vital to understand how people perceive their situation and that this is an important element in transformation, it is not necessarily sufficient to ensure transformation.

Although, in Phase One and to some extent in Phase Two, I remained unaware of the importance of the researcher’s position within an orientation, I nonetheless experienced its effects. As I grew in my ability to question theory and practice, and was aided in 1998 by Janse Van Rensburg from the Rhodes University Environmental Education Department, the confusion began to lift. It became progressively clearer to me that I was unconsciously applying positivist principles within human contexts and that this was, as Janse Van Rensburg (1994) points out, inappropriate. Furthermore, “to apply positivist principles to human situations and attempt to temper, but not abandon these principles” is unacceptable (Janse Van Rensburg, 1994, in Dison, 1998, p. 5). It was at this point, then, that I made a deliberate decision to interrogate my work and ensure that it could be described as participatory in all aspects.

On further exploration I found that I had not been aware of the implications of straddling two orientations as different as the dominant and participatory. I thus applied labels such as ‘quasi-science’ to my work. The following observation from Carr and Kemmis (1986) illuminates the tensions inherent in such a standpoint:

Those who have argued that the social sciences should adopt the aims and methods of the natural sciences have maintained that this kind of everyday understanding merely constitutes a starting point in the search for testable hypotheses and general laws. Others, however, have argued that since social life is the product of these everyday understandings, the social sciences should aim at ‘interpretation’ rather than scientific explanations (Carr & Kemmis, 1986, p. 86).

I found that my attempt to hold onto a ‘quasi-science’ approach (which is necessarily heavily influenced by the concerns and concepts of the dominant orientation) had profound implications for my research process. My efforts to merely collect information – and thus not to be concerned with involving local people and engendering change – resulted in the stakeholders and the community owning none of the decisions made, from representation to management to action plans. Therefore they neither participated in nor committed themselves to long term change. In this context I remained an external practitioner and the principal driver for the project. Essentially, there was no sustainability. These experiences provided useful lessons: after reflecting on them, I recognised that economic influences were also major drivers for people’s awareness, attitude and behaviour towards water resource management (Chambers, 1992; Fargher 1996).

4.4.5 Phase Two - Setting a New Path

The learning and reflections made through my period of confusion motivated me to revise my approach with the villagers. I began to create an atmosphere conducive for meaningful interaction and shared learning and opened up the research process to include the adults living in the villages of Hertzog and Fairbairn. Phase Two became marked by a period of learning and exploring participatory assumptions, although still influenced by the dominant orientation.

On 5 May 1997, I arranged a meeting with the community and invited the villagers to participate in discussing and reflecting on their environment. During this meeting, the participating villagers identified and articulated their awareness of the need to work together as a community in order to investigate their riverine resource problems. I was understood to be a facilitator of this process. The participants agreed that a series of environmental awareness workshops would assist the expression of local knowledge and the eliciting of new perspectives from which to view their current situation and build their confidence. The community also requested that I continue to provide support and facilitation skills.

It is crucial to bear in mind that stakeholders will have little motivation to invest and participate in IWRM if their underlying needs are not addressed or incorporated by the processes to be implemented. As Fargher’s (1999) diagram in Figure 4-2 illustrates, effective engagement and participation between two parties (represented by the triangles in the Figure) focuses on overlapping needs and in so doing requires a shift away from focussing on public positions or wants.

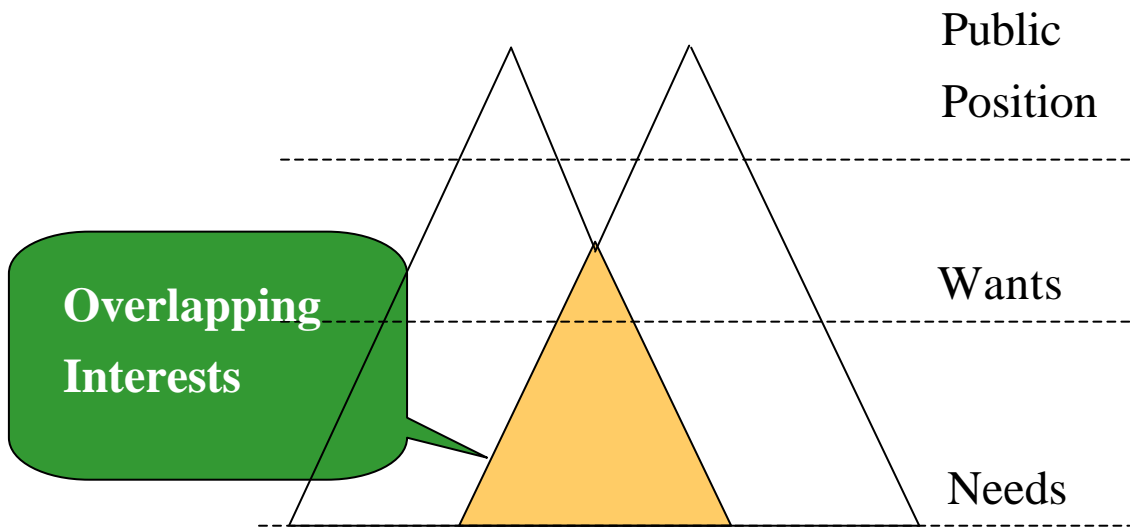


Figure 4-2 : Shift from Public Positions to Needs

The concepts of overlapping needs and common needs understood in this research are include (Fargher, 1999):

- Overlapping needs are complementary in that they provide opportunities for mutual benefit (activities by one group also benefit the other group). For example, clearing firebreaks in a forest reserve could provide a firewood resource that reduces the need for communities to harvest wood from other parts of the forest.
- Common needs allow efficiency through cooperation – activities done jointly will cost both groups less and yet achieve the same overall outcome. For example, reforestation activities may provide shelter, honey and grazing benefits to communities in the short-term and timber benefits to forestry institutions in the long-term. Both parties, namely the researcher and participants, thus have an incentive to cooperate for reforestation activities. So long as rights and responsibilities are clear, it should be possible to use local community labour to plant and maintain reforestation seedlings provided by forest institutions.

These concepts were central to this stage of my work as, once the communities of Fairbairn and Hertzog had identified their needs, they were empowered to work towards a common goal. This is not to imply that such identification is a once-off exercise. On the contrary, the identification and evaluation of needs became an ongoing process and a platform upon which diverse stakeholder groups could find commonality. Equally, Fargher (1991) taught me that I could not facilitate or support active IWRM unless I also acknowledged and recognised the needs of Department Water Affairs and Forestry (DWAF) and my funders.

During this phase I discovered that it was critical that the participants were provided an opportunity to tell their story and to identify their needs in IWRM. I came to acknowledge that I should never presume to know what a community might need or what their priorities might be. The only people who can speak with authority in this regard are members of that community. Recognising this required me to be open and to have the ability and a willingness to 'let go' of my preconceived notions of what the community 'should' need in order to be able hear what they did need. I also had to be aware that my own interests and aims could blinker me – thereby obscuring the needs of the community – and that constant critical self-reflection was required in order to protect against this. The first identified needs of the community people of Fairbairn and Hertzog were to plan, design and implement two environmental awareness workshop based on the local context.

Through coming to work with the local people, an investment cycle started to be developed as the community people and I started to negotiate a timetable of events, roles, and responsibilities for designing and implementing the environmental workshop. Investment cycles are one mechanism by which stakeholders can be incorporated into a research program so that they can meaningfully shape the program and results (Fargher, 1996).

In Phase Two I was intent on following the participatory orientation and I often sought an answer to rural river rehabilitation problems from the local knowledge of participants. This was seen in the environmental awareness workshops as I still sought to record information on participant knowledge from which a river management plan could be developed. I still felt responsible for recording participant information to inform outsiders, instead of trusting local people to take charge of their development. However, through the environmental workshops, I gradually came to understand that the local people were there to learn and not give me all their knowledge. And through them wanting to learn, they started to build confidence in themselves and seek a way forward in which they could become confident to work with outsiders themselves. It was through this process that I increasingly recognised my role as that of seeking to understand how to build people's capacity and learn to provide the necessary platform for rural people to participate in the management of their own resource base. The underlying focus on my need to collect information was also driven by the University Department still being based within the dominant orientation that saw facts and evidence for a PhD thesis rather than the outcome from a process, as is suggested by Action Research. I felt at many times my thesis was caught between where the community and I wanted to go and where I thought the requirements for a PhD thesis directed.

Finally, it was in this phase that the local stakeholders, the team of grassroots facilitators, and I started to see capacity building as a means of ensuring inclusiveness throughout the process, from planning and formation to action. Although I was still straddling the dominant and participatory approaches in this

phase, I became much more explicit and conscious about my desire to work within the principles of PRA. This was of enormous assistance as these principles guided me, helped me judge situations, and stood as a constant point of reference. If I felt worried or indecisive about an issue I would use my knowledge of the participatory principles (listed in Section 4.3.3) to inform the situation I was in. In this way I began to understand how to translate theory into practice, and to experience for myself, the insight that the two are interrelated (Cassara, 1987). This gave me confidence, increasing my ability to embrace openness and flexibility, and enjoy the value of participatory and reflective work.

4.4.6 Phase Three - Facilitating Capacity Building to Enable Action

Phase Three of the research was strongly rooted in participatory philosophy and methods. Thus the work was nurtured by and with the stakeholders, rather than being imposed by outsiders. In this I came to acknowledge that I was a guide, a co-learner and a motivator for change for a limited period of time. I also came to appreciate that participatory research cannot be considered as only the act of bringing stakeholders together to talk. It is a method of working that remains deeply concerned with philosophical issues, for example reflecting on the need to not take during work with participants, but working with the local people to bring about change though being accountable, and by appreciating and respecting the local people as the clients (See Sections 4.2 and 4.3). Thus I constantly reflected on my work and methods in order to ensure a healthy self-critical mode that promoted accountability to ensure I was working within participatory assumptions and not those of the dominant assumptions. Accountability is especially important in building a long-term relationship with participants – making it clear who you are, why you are there and managing the expectations of participants so that they are not led to believe that solutions will eventuate without effort.

The adoption of Action Research principles in Phase Three was inspired by the need to focus on changing the present in order to create a different future. Embracing tenets of Action Research also required that I shifted from a relatively passive position to one in which I understood myself to be an activist. Thus I moved towards focussing on searching for opportunities that would enable the participants to investigate their water resource reality in order to transform it (Fals Borda, 1979 in Kemmis, 1995). Kemmis (1995) describes this as a “collaborative social process of learning, realised by groups of people who join together in changing the practices through which they interact in a shared social world” (p. 36). As Lincoln and Guba (1985) point out, in order to claim valid and reliable results, it is necessary to ensure that the research problem, policy option, orientation, theory, and context are congruent. Bearing this in mind, Action Research seemed to offer the best solution. It provided “an opportunity to create forums in which people can join one another as co-participants in the struggle to remake the practices in which they interact – forums in which rationality and democracy can be pursued together, without an artificial separation ultimately hostile to both” (Kemmis, 1995, p. 36).

Phase Three, which focused on the building the capacity of local people and providing support in their development of institutional structures - a catchment forum and a water users association (WUA), appears to shift the focus away from the broader riverine environment. However, through creating capacity and IWRM institutions the local people could come to gain their confidence and, through the IWRM structures, have a say in their water resource environment.

The narration of the process of research in Phase Three reflects Carr and Kemmis' (1996) belief that action researchers should aim to be open with practices, understandings and situations through "retrospective understanding and prospective action [that] 'looks back' to the previous moment for its justification, and 'looks forward' to the next moment for its realisation" (Carr & Kemmis, 1996, p. 186). It was through using this process that I started to understand and explore the elements of capacity building that enabled local people to meet their task. I realised, however, that I could not do the task for them. As the local people felt broken (See chapter Six) and lacked confidence in themselves and in their knowledge, capacity building was essential for them to achieve their goal. No longer, was I searching for data, but rather searching for and interrogating within the forum context the elements that enabled local people to gain confidence and knowledge to design and become part of the WUA and CF. These goals were acknowledged through running 45 sub-projects, of which for example one project could involve up to 14 workshops. In this thesis I do *not* provide a step-by-step guide to every single phase of the process, but rather examine the assumptions and concepts that these workshops were based upon. These concepts guided and framed the work of involving stakeholders in IWRM and, without such a conceptual framework, the process would have become messy, undirected, and unsustainable in such a way that frustrates and angers stakeholders.

Thus Phase Three was characterised by conscious and deliberate efforts to examine my practice by observing not only the actions taken, but also the consequences of those actions. This ongoing process initiated development of guidelines on how to build the capacity of marginalised groups in South Africa. I have shared these thoughts verbally and in written format with the team, fellow academics, the funders and a range of practitioners, and the reader can find them discussed in detail in Chapter Nine. Each of the groups with whom I shared my work offered commentary and other feedback to me during reflective sessions.

4.5 Conclusions and Reflections

As this chapter reveals, I underwent a journey of growth over the three phases of the research process. In Phase One I believed that I could act as the main recorder of information and become a 'bridge' between the marginalised groups and the external stakeholders. I also hoped that in bringing these two

groups together, there would be a recognition of common needs and thus the motivation to start working together to bring about IWRM. At this stage, however, neither the local nor the external stakeholders (such as Water Resources Managers) felt a part of the research or had the confidence to engage with each other. Therefore there was no desire to seek to manage water resources jointly. However, the experience of Phase One initiated a relationship between Hertzog and Fairbairn participants and me that opened us to the realities of their daily lives.

In Phase Two, the community and I built a participatory framework and learnt to negotiate and respect overlapping needs. In this period we learned to trust, share and commit to IWRM: thus the process of capacity building began to emerge as pivotal. The work was undertaken with the express aim of offering participants a sense of personal self-worth, as well as a good understanding of IWRM. The former was vital to ensure that participants felt capable of entering into IWRM debates.

In Phase Three there was a continued focus on building people's capacity in order to facilitate engagement in IWRM at a catchment scale. The process of change required guiding philosophies and methods that could support marginalised groups as they moved towards reclaiming their ability to influence and control their own environment without being overwhelmed by feelings of distress and anxiety.

In this Chapter I have sought to demonstrate how application of Action Research and Participatory Resource Appraisal philosophies assisted marginalised groups in tackling issues affecting their own environment, alongside other stakeholders from within the area and without.

As Connole (1993) points out, social science research has become a problematic activity, resulting in the ongoing controversy regarding the encroachment of participatory orientations on the monolithic dominant orientation. Chalmers (1982) adds fuel to the fire by likening traditional approaches to a "lumbering dinosaur, yet some folk persist in thinking that dinosaurs are wonderful creatures" (in Connole, 1993, p. 4). Lincoln and Guba (1985, p. 34) point out that the debate is characterised – in some quarters – by a desperate optimism in which the two contradictory orientations can be reconciled to the point of being "married off and live[ing] happily ever after". In this context a shift to the participatory orientation could be described as "a revolutionary move" (Lincoln & Guba, 1985, p. 47).

That the debate continues, and vehemently so, is due in no small part to the fact that the concepts and concerns of the dominant orientation are pervasive and highly influential (Jansen, 1989). In fact, Chalmers (1982, in Connole, 1993) goes so far as to call the dominant orientation a modern religion. There are those, of course, who consider the entire debate not much more than a nuisance and essentially

“meaningless” (Griggs, 2000, p.10). Griggs (2000) takes stern issue with such cavalier attitudes and emphasises that philosophical concerns are intrinsic to any research design, whether the researcher chooses to acknowledge them or not. Beneath any orientation, and serving as its foundation, are specific theories generated by certain philosophies. As Griggs (2000, p. 11) points out “only the naive or arrogant would attempt to arrive at their own philosophy of science without first understanding the philosophical debates that have occupied some of the greatest minds in history”.

The above debate has had a profound effect on my work. My research journey was bound up with the consequences of shifting from working within the dominant orientation to embracing a participatory one. There were, for example, inherent paradoxes evoked by my attempt to develop a participatory research design while still implicitly beholden to principles characteristic of the dominant orientation. The piece below was written as a research finding in late 1997 and serves to illuminate some of the complex and interwoven issues which confounded my research:

Critical reflection reveals that I had not thrown off the blinkers I carried with me from my training in the dominant orientation. These blinkers were ‘unconscious’ and even as I attempted to employ a participatory approach I was still caught up in dominant concerns and concepts. Because I was blind to the influence that this orientation exercised over my work, I was very vulnerable to straying, entirely unwittingly, from true participatory principles. I didn’t understand why this was happening and much confusion and many obstacles marked my journey. Each of these obstacles was a piece of the puzzle, and each was a hint, which pointed towards why I was struggling.

A revealing issue was my concern that my presence could influence the behaviour of members of an observed group. I perceived this as negative because I wanted to ‘find out’ peoples’ ‘true’ responses. Clearly, I was incapable of accepting and dealing with a multiplicity of truths and stories. Being presented with these was a confounding experience; I had no idea of how to make sense of the multiplicities, how to ‘piece them together’, of where my analysis should start and how I was going to be able to generate ‘answers’. These are patently concerns rooted in positivist thinking. I further fell into the trap of not questioning my underpinning orientation; in a sense, I took it for granted. Thus, although I set myself on an alternative path positivist blinkers blinded me. In an attempt to grapple with my confusion, I tried to question my methods: perhaps I was not executing the exercises correctly? Was my inexperience the cause of these obstacles? Of course, what required interrogation was not my methods, but my philosophy. Not realising this led me to continue to attempt the use of innovative methods in order to win participants’ trust and confidence and allow the process to be meaningful. Without an attendant interrogation of my underpinning orientation, these efforts were well-intentioned but ineffectual (Motteux, 1997c).

As the above extract reveals, my progress was hampered and I found this disorientating. I was not utterly lost, however, because I had consciously set out on my journey as an explorer and was prepared for change and for issues to emerge. My journey was assisted, frustrated and encouraged by many people - supervisors, colleagues, participants, friends and participants. Lincoln and Guba (1985) characterise such thinking as true to a participatory orientation in that research design within this orientation begins with a focus that is encouraged to unfold as the process moves forward.

As this chapter has demonstrated, I experienced a growing desire to work with people rather than 'do research' on 'them'. And, as I became increasingly more aware of the issues to hand, I was able to recognise that participatory philosophy needs to rest on a participatory world view. This insight was particularly illuminating when applied to a process of questioning my own embedded values and assumptions, as well as those of my funders and supervisors. I realised that all our starting assumptions had, perforce, directly dictated and influenced the path of the research. Furthermore, because these assumptions had been primarily forged within a positivist, modernist ecological paradigm, they frustrated my ability to use a participatory approach. This is not, I think, an unusual experience for social science researchers seeking to work within participatory orientations.

Having decided to adopt a participatory orientation and eco-centric ecological paradigm as the philosophical framework for the research, I then reviewed the range of methods available to me and selected those that were appropriate to the research aims and objectives and the philosophical framework. This is explored in Chapter 5.

5 Methods

5.1 Introduction

This Chapter focuses on the tools used in the research. I explain how Phase One of the research drew on tools that are commonly used in the dominant research orientation. In phases Two and Three the research became rooted in participatory methods. A key characteristic of participatory approaches, such as participatory rural appraisal (PRA) is a shift away from extractive tools to those that empower community people to take charge of their development. In this there is an attendant shift towards using innovative tools that recognise the need for the practitioner and the local people to contribute jointly towards the information required. Thus there is an emphasis on accessing both local and technical knowledge, encouraging regular dialogue and using reflection to motivate positive change (Chambers, 1992a).

In Section 5.2 I present and define the methods used in Phase One, Two and Three respectively. Cassara (1987, pp. 39 - 40) observes that “research methods will be various and different to fit different situations. Participatory research is comprehensive, various, creative, and never twice the same”. This chapter will not offer a detailed inventory of every method used in every situation. Doing so would necessarily require presenting enormous amounts of information, which, by itself, would offer only a simplistic description of the work undertaken. Rather I have chosen to describe specific examples and discuss them in depth.

In outlining the methods in Section 5.2, it is also important to appreciate that because my work shifted from the dominant to the participatory orientation, a method used in Phase One cannot be seen as being directly transferable to another phase of the project. This serves to underscore a key issue presented in this chapter: the application of ‘participatory methods’ will not on their own ensure participatory IWRM. As discussed in Chapter Four, orientation underpins and drives method. In order to illustrate this, a practical demonstration of how a questionnaire can be used in either a dominant or participatory orientation is offered in this chapter. In Section 5.3, I provide an outline of the thorough planning, budgeting and teamwork required by participatory methods.

Finally, Section 5.4 provides a reflection of one of my key findings, namely that there is no simple, universal method that enables and encourages rural people to participate in IWRM. Central to this is the realisation that methods should be treated with respect and that it was crucial for me (the researcher) to interrogate my own situations and reasons for selecting particular methods. Thus, for me, as for any researcher, there is never an end to continuing growth and evolution.

5.2 Background to the Methods Used

The chapters detailing Phase One (Chapter Six and Seven), Phase Two (Chapter Eight) and Phase Three (Chapter Nine) provide a detailed description of how I conceptualised and used various methods.

The objective of my fieldwork was to help marginalised groups to participate actively in IWRM. This necessitated exploring local knowledge, building participants' confidence, encouraging collective learning and understanding threats and opportunities. Many authors have written on participatory methods, such as Chambers (1992a, 1994a); Mukherjee (1993) and Pretty *et al.* (1995). It must be pointed out, however, that in Phase One there were few PRA resources available to me locally. This was further confounded by the fact that I had no access to literature accessible on the Internet because at the time Rhodes University did not provide such access. The literature that I did manage to obtain was often photocopies (of photocopies in some cases) of books, journals and research notes, most of which most came without full references (i.e., authors, titles or publishing houses). Nonetheless, this material was enormously valuable in that it helped me gain some idea of the work that lay ahead of me. Those whose work I can cite include Paredes, (date unknown); Swantz, (1975); Lindsey, (1976); Leitko & Peterson, (1982); Fals-Borda, (1984); Verhagen, (1984); Boal, (1992); Chambers (1992a, 1992b, 1994b); Burkey, (1993); and Pretty *et al.*, (1995).

Like many students in Africa, I found myself limited by poor access to information through formal channels and so had to rely on informal networks to obtain and share new ideas. At the start of Phase Two, I received welcome assistance from Van Vlaenderen of the Rhodes University Psychology Department, who compiled an annotated bibliography of participatory literature. By the time I began Phase Three, there was a considerable amount of material available and, furthermore, I was able to travel to the Institute of Development Studies (IDS) at Sussex University and access the PRA resource centre.

In Phase One I administered a questionnaire informed by traditional social science approaches to surveys. This is outlined in Section 5.2.1. The lessons learned from this experience prompted me to look for other research methods. Accordingly, I then drew on the work of Chambers (1992a), Pretty *et al.* (1995) and Boal (1995, 2000). These authors use similar methods in different contexts: PRA (Chambers 1992a and Pretty *et al.*, 1995) and Theatre for Development (TD) (Boal, 1995). Section 5.2.2 discusses methods used in PRA, while those characteristic of Theatre for Development are outlined in Section 5.2.3. Thus my methods were marked by an innovative and flexible approach that allowed, for example, the use of drama in a transect walk.

Chambers (1992a) points out that it is both unrealistic and obstructive for the practitioner to cling to fantasies of 'doing everything right'. In learning this for myself, it proved necessary to monitor the effectiveness of the methods carefully as they evolved and, where necessary, adapt them. This ensured that they remained appropriate to the needs and articulated requests of the participants. Of the following list of methods, some were more effective than others in achieving the outputs: awareness-raising programs, background research, action planning with the stakeholders, regular feedback, continuity between activities and task allocation. In addition I employed diverse methods to reinforce concepts, was adaptive and creative, and networked.

5.2.1 Traditional Field Work Tools

The following methods, and their definitions, were used during the first Phase of the research.

- **Surveys** – surveys and questionnaires are a popular social science research method of collecting standardised data. They are particularly useful in providing an indicator of population characteristics. They seek representation of the greater population and to diminish the influence of the person conducting the survey. Administering a survey normally requires a direct dialogue with a respondent who is asked to answer a range of questions (Nachmias & Nachmias, 1987) as shown in Plate 5-1.
- **Interviews** - can be categorised by their degree of structuring or standardisation, such as 1) a scheduled, standardised interview, 2) a non-scheduled standardised interview, 3) a non-standardised interview (Babbie, 1979; Nachmias & Nachmias, 1987; Denzin & Lincoln 1994; Bless & Higson-Smith, 1995).

5.2.2 PRA Field Work Tools

PRA was introduced in the literature review (Chapter Three). The following methods, and their definitions, were used during the second and third Phases of the research. The methods described were not just to acquire data but to encourage capacity building and self-esteem. I then review the difference between PRA and Rapid Rural Appraisal (RRA) methods and verbal and visual tools.

- **Setting tasks** - a tool that I used after a program in order to effect any of the following: 1) a summary of the workshop; 2) challenge participant(s) to act and reflect on their learning in relation to their own context and; 3) evoke thought through a practical exercise. This is aligned to the Active Learning Model of the National Environmental Program (O'Donoghue, 2001) in which communities are seen as active partners in a educational, enriching and challenging process of information-seeking, inquiry, action taking and reporting. Such a process is understood to take place in a range of contexts and encompass all issues regarding the environment. Plate 5-2 shows a participant carrying out the task of planting a tree as an outcome from an environmental awareness workshop.

- **Warm-ups** - are used to relax and invigorate participants at the beginning of a workshop. Plate 5-3 illustrates the use of a warm-up during a workshop when fatigue set in. The objective is to stimulate concentration and creativity. Warm-ups may or may not relate directly to the topic that is been presented.
- **Brainstorming** - a tool used to generate new ideas quickly, usually in a large group. It also seeks to elicit lively debate and discussion. In my own work, this tool enabled ideas to flow freely and allowed all participants to have a voice.
- **Participatory observation** - this method draws on social anthropological methods in which the researcher observes local activities and becomes aware of the physical, social, historical and political environment. Participatory observation is carried out by living with local people, attending social functions and engaging in informal interactions (Chambers, 1992b).
- **Case-studies and stories** - are topic-focussed, in-depth, highly detailed responses to a practitioner's request for information based on a participant's life experience.
- **Discussion with key informants** - are informal dialogues used to elicit responses on a particular topic without relying on a structured tool such as a survey.
- **Posing questions** - is used to encourage participants to speak freely, and resulted in the participants being able to address their most urgent threats and opportunities.
- **Dialogue** - is a discussion that takes place with a commitment to listening, understanding and, if required, seeking positive change (Freire, 1972). Plate 5-4 illustrates dialogue taking place between workshop participant and a team member during a workshop. Dialogue usually takes place face-to-face, however, it can also be conducted via email or telephonically. The emergence of email and cell phones in Africa has greatly reduced the isolation of researchers by allowing them to dialogue with participants and colleagues - something that I made great use of in Phases Two and Three.
- **Focus groups in workshops** – small group dynamic method used in workshops with a large number of participants. The participants are encouraged to establish small groups that enable the quiet and less dominant participants to express their views. There are many methods surrounding this including Problem Census Problem Solving (Fargher, 1991).
- **Logical frameworks** – a development tool used to structure information from participants so that a goal is linked with outcomes, outputs and inputs. These are described and objectively verifiable indicators and assumptions identified for each.



Plate 5-1: Administering a Questionnaire - Direct Dialogue with a Respondent



Plate 5-2: Outcome from an Environmental Awareness Workshop

- **Group discussions** - are a communal platform upon which information is shared, enabling a broad understanding of a particular topic or issue. These groups are typically much larger than those used for focus group methods.
- **Participatory mapping** - is a visually-orientated method which enables illiterate participants to contribute collective knowledge, for example, where resources can be found.
- **Transect walks** - are a systematic exploration of a particular area, involving asking, listening, identifying and observing, so that problems and solutions can be clarified.
- **Time-lines, and trend and change analysis** - are methods that indicate linkages, changes, areas of concern and strengths and weaknesses through the use of diagrams. They also show how things have changed through time.
- **Recording** - this can include various media such as visual (photographs), audio (tape recorders) and the written word. The latter included conventional recording and observation as well as my personal feelings and experiences. All methods of recording sought to be “grounded in thick descriptions that are vivid, nested in a real context over a sustained period” (Miles & Huberman, 1994, p. 10).
- **Participatory monitoring** - is the “systematic and continuous process of assessing the progress and changes caused by the implementation of an activity over a certain period of time, usually using pre-determined indicators or recurrent questions” (Guijt, 1998, p. 14).
- **Joint planning** - enables stakeholders to work together in establishing the inputs, activities, outputs, outcomes and the goal of the project. Within this collaborative effort, short-term activities form the building blocks for the project’s overall plan.
- **An investment plan** - a timetable of events, roles and responsibilities and evaluation indicators. Within my research, an investment cycle was a useful tool with which to construct well thought-out programs and ensure that processes did not develop in an ad hoc manner. In this, it is important to create an investment cycle with participants to ensure that the investment is owned, wanted and cared for by the stakeholders both currently and in the future.
- **Workshops** - are formal meetings, often with many participants, in which a collection of people come together to learn, share, analyse, and review alternatives. The objective is to bring about change in an accountable manner. Hate 5-5 illustrates how workshops were a key method for communicating ideas, identifying needs and planning actions in the research.
- **Feedback** - involves presenting to participants any findings that have occurred during the research program. Feedback can be in many forms including meetings, theatre, songs, printed posters and articles as well as individual dialogue. In my work, the content of such feedback varied from information gained solely from the community to information from outside forces, or a combination of both. I ensured that feedback meetings were as inclusive as possible (at village or catchment scale) with the purpose of ensuring that all participants, including the practitioner, were informed and thus able to make appropriate decisions.



Plate 5-3: Use of a Warm-Up During a Workshop



Plate 5-4: Dialogue between Participant and Team Member during a Workshop

Chambers (1992a) allows that RRA has some tools in common with PRA. The main point of distinction is that PRA methods are empowering for participants, whereas RRA and extractive methods disregard the ability of participants to define and understand their problems, and take action. This serves to ensure that RRA tends to obscure the capacity of rural people. In this, the focus and intent of RRA is neither emancipation nor joint participation in exploration of the research issue in order to bring about positive transformation.



Plate 5-5: Workshops were a Key Method in the Research

Within the actual undertaking of research with participants, various practitioners (for example, Mukherjee, 1993; Pretty *et al.*, 1995) have come out in support of the worth of shifting from verbally-orientated methods (formal interviews and written assessments) to visually-orientated ones (mental mapping and diagramming). Chambers (1992a) states that any combination of visual and verbal methods, with “early primacy to the visual, can be strong, and stronger than either exclusively on its own” (p. 44). In the Table 5-1, verbal (as discussed in Section 5.2.1) and visual (as discussed in Section 5.2.2) methods are contrasted to highlight the differences between extractive and participatory methods. This table is adapted from Chambers, 1992a, p. 43 and Pretty *et al.*, 1995, p. 79.

Table 5-1 : Comparing Verbal and Visual Methods

The Components	Verbal (Interview, Conversation)	Visual (Mental Map, Diagram, Model, Drama, Play)
Investigator's mode and role	A probing investigator	A facilitator and catalyst
Local person's mode and role	A reactive respondent	A creative analyst and presenter
Aim	Extraction of information	Working towards local analysis
Local people's awareness of investigators	High	Low
Degree of eye contact	High	Low
The medium and materials chosen by	Investigators	Local people
Information flow	Sequential ¹³	Cumulative
Accessibility and stability of information to others:	Low and transient	High and semi-permanent
Responsibility for cross-checking held by:	Investigators	Local people and project team members
Ownership of information:	Appropriated by investigators	Shared, can be owned by local people

Table 5-1 shows that visual methods enable illiterate and literate people to work with each other as equals in the process. Visualisation generates pictorial or symbolic representations of different types or aspects of rural life. There is increasing evidence that visualisation is effective. Pretty *et al.* (1995) report that visualisation can “provide a focus for attention while discussing an issue; stimulate discussion by both non-literate and literate people; can represent complex issues or processes simply; provide a means for cross-checking and therefore provoke effective group work; evoke creative associations; stimulate people’s memory about their past and present situations; reinforce the written or spoken word; and assist in decision-making and monitoring” (Pretty *et al.*, 1995, p. 77 – 78). Writers such as Chambers (1992a) and Pretty *et al.* (1995) believe most people have a natural competence for visual literacy and that this ability enables participants to “share, enhance and analyse their knowledge” (Chambers, 1992a, p.1) of life in a profound way. Examples of visualisation methods employed in this research were mental mapping, transect walks and time lines. There are a range of diagrams and visualisations that can be usefully employed by the researcher in IWRM concerns (Mukherjee, 1993; Pretty *et al.*, 1995).

5.2.3 Theatre for Development

Theatre for Development methods proved helpful in enabling participants to understand and explore their situation and seek alternatives. Two texts in particular informed the methods used in my research: Boal’s

¹³ Research is traditionally seen as a linear process with a final analysis upon conclusion. In participatory methods, however, research is seen as a process in which people continually learn collectively and critically reflect as they grow.

(1992) *Games for Actors and Non-Actors* and *Dramatic Learning*, which offered methods such as Forum Theatre, Image Theatre and Performance Theatre (Boal, 1995; Motteux & Rowntree, 1999b; Burt, 2000). The following Theatre for Development methods were used in Phase Two and Phase Three of the research.

- **Forum-Theatre** - is the use of local and outsider actors as facilitators to provide a fictional context with which the community can identify. This facilitates and allows for participatory experiences, discussions and problem solving. I used this method in a range of situations. An example is an instance in which a scenario was first performed with the community as passive observers. Following a subsequent discussion, the community was then encouraged to take a more active role in a rerun of the play. This was achieved by the community articulating their suggestions, objections, solutions and comments about the scenario presented in the play as shown in Plate 5-6. This process encouraged group interaction, problem identification and the internalisation of key environmental considerations. Jackson (in Boal, 1992, p. xxi) explains the concept of Forum Theatre thus: “Forum Theatre is a theatrical game in which a problem is shown in an unsolved form to which the audience, again spect-actors¹⁴, is invited to suggest and enact solutions.”
- **Image Theatre** - was used to access emotions, both those that were unacknowledged and those that were conscious. Image Theatre is most powerful when it is used within a group, although it can also be employed between a participant and one other. Jackson (in Boal 1992), defines Image Theatre as “a series of exercises and games designed to uncover essential truths about societies and cultures without resort, in the first instance, to spoken language – though this may be added in the various ‘dynamisations’ of the images” (p. xix). As shown in Plate 5-7, participants used their bodies (facial expressions, posture, and position) or its representation of something else (candle) to form an image that expressed their emotion, experience a belief or a thought. This image was ‘frozen’ to allow the individual to feel the emotion and for other participant to observe the image. Image theatre was developed by all participants in the group forming an image or by each participant in the group taking turns to form an image (Berold, *et al.*, 1999).

¹⁴ A spect-actor is, according to Boal (1991, p. xxiv), “a member of the audience who takes part in the action in any way; the spect-actor is an active spectator, as opposed to the passivity normally associated with the role of an audience member”.



Plate 5-6: Participants Making Suggestions about a Play Scenario



Plate 5-7: Participants Expressed their Emotion, Experience, Belief or Thought

- **Performance Theatre** - was used to communicate information to large gatherings of stakeholders, particularly those from different groups. Used in this form, drama was not intended to elicit participation within the performance – the spectators were more of an ‘audience’ in the standard, passive sense of the word. However, avenues for participation existed in that the participants decided what information should be presented in the play, and in what form.

5.3 Practical Use of Methods

This section describes the specific elements of planning, budgeting and team building in the research. It provides insight into the many tasks that were essential to carrying out the research activities. The process of planning, budgeting, team building and managing was a process and not an event, and one that focuses on acknowledging that success relies on professional team work and co-operation.

5.3.1 Planning

Pretty *et al.* (1995) note that each participatory session to be undertaken requires crucial planning in areas such as materials, venue, seating arrangements and timing. In addition, the following areas also require attention: mapping a potential design for each session; seeking advice; employing ‘experts’ where necessary; gaining background information; translating work sheets; and budgeting. Below are examples of elements of planning that were relevant to the participatory phases of the process. This example stands as an outline that is not directly transferable to every participatory session, as each session was different. Thus, in each instance, I was required to interrogate the work and the context in order to ensure that the plans were both relevant and functional.

- A full list of the materials required was drawn up and all materials were pre-packed before each workshop. Materials included sheets of newsprint, sticky tape, coloured pens, glue sticks, scissors, pens, notebooks, a tape recorder and camera.
- The venues for each workshop were evaluated in terms of how they could potentially affect the stakeholders’ and team’s performance, and to ensure that the venues were as accessible as possible for all interested parties.
- Pretty *et al.* (1995) note that seating arrangements “have a big influence on the session” (p.15) and, if necessary, at the start or during a session fellow facilitators and I changed the organisation of the meeting space so that it impacted on the behaviour of the participants. For example, sitting in familiar seats sometimes allowed the stakeholders to become more passive in the workshop, so we rearranged the seating to encourage spontaneous and active involvement.
- The appropriate length of each exercise was also discussed in planning sessions. Lengthy sessions can impact negatively on concentration levels (Pretty *et al.*, 1995), while short sessions can cause

anxiousness and rushed work if participants do not have enough time to complete the exercise. Practice sessions provided a useful approximation of the timing for each exercise.

- In mapping plans, the concept of ‘vivencia’ proposed by Fals-Borda (1984) served as the underpinning framework. ‘Vivencia’ requires the planner to intuitively comprehend the process, to feel and enjoy it and understand its reality within a wider context. Thus, all possible events that could affect the planned session were explored. For example, we asked questions such as: What if nobody comes to the session? or What if it rains? I refrained from using confusing methods, and worked with the knowledge that the design could not be cast in stone, as failure to involve stakeholders’ agendas would lead to a top-down workshop. An example of the latter is the fact that the PRA methods used were frequently adjusted in response to the participants’ moods and in keeping with the research’s aims and objectives. Also, the PRA methods chosen were carefully matched to a specific group. For example, depending on the participants, either written or visual aids might be used. I was careful to prepare agendas that were realistic in both time and capacity. Unplanned sessions could lead community people to believe that they are wasting their time. Lincoln & Guba (1985) argue that an unfolding plan must be “orderly” and that each “successive element [should be] chosen so as to complement the earlier unit, in accord with the need to extend, test, or fill in earlier information” (p. 234). Thus thorough agenda planning took place off-site and on-site, and at most large stakeholder meetings the agenda was posted or distributed by hand so that people could decide whether or not they wanted to attend. Of course, bearing participatory needs in mind, the agenda was open to change during the course of the meeting.

5.3.2 Budgeting

Phase One and Phase Two were funded by a student bursary from the National Research Foundation (NRF) and the Water Research Commission (WRC). These funds, of approximately R50,000, covered the period from 1996 to 1998. During Phase Three the research complemented by a contract funded by the WRC to the value of R500,000 from 1999 to early 2001. The small – but much appreciated – budget for Phases One and Two taught me to cost each task in hand, a valuable lesson which I carried into Phase Three. Equally, beginning my work on a limited budget empowered me to continually explore new avenues, be flexible, learn, and embrace changes in my methods throughout the following phases.

In a simple cost-benefit analysis, sub-projects were assessed and prioritised in a step-by-step process leading to the broader vision of the research and the potential role of participants. Therefore, financial evaluation involved examining the potential effects on future plans, in association with the future’s likely investment requirements. For example, undertaking environmental awareness workshops in Phase Two was a long-term investment, consisting of community workshops and meetings, translation costs, printing and administration costs, and the travel and subsistence costs of the participants, co-workers and myself.

Thus, I found that one investment in fact necessitated a series of investments. It is for this reason that I learnt that an investment assessment requires evaluation of the net cost and benefit of the plan in order to establish a long-term goal for the stakeholders.

Since each action required an investment that had to be accounted for, budgeting was imperative. In this, alternatives for expenditure needed to be considered, such as buying supplies in bulk to keep costs down, finding accommodation in the community as opposed to staying in hotels, and using local or cheap transport as opposed to hired cars. Examples of budgets used for the research are presented in Motteux, 2001.

5.3.3 Team Building

Central to any success that this research can claim was the team that enabled the participants to participate in IWRM. Team members were selected from disadvantaged backgrounds, or were local university students. The common selection criteria in both instances were that individuals needed to be willing to use their talents and contribute meaningfully to the work. The selection itself (for example how many people could be hired) was partly influenced by budget constraints, but held true to the principle of giving local people equal opportunities for employment. Hiring or relying on consultants would have inflated costs, severely limiting the scope of the budget. Further, such a hiring policy would have demonstrated a lack of trust in the capacity of marginalised groups, and would thus have failed to contribute to any form of empowerment and capacity building.

As the leading practitioner of this team, a considerable amount of my time was dedicated to searching for an enabling environment that would encourage the team to express their ability to be adaptable, self-motivated, self-reliant and capable of creative thinking. In this, I also sought to create a space in which team members were able to build their own capacity. They did this by exploring the use of drama and honing skills such as interpretation, report-writing in English and Xhosa, using computers, facilitating workshops, listening to the community, feeding back and distributing information, as well as keeping me, the practitioner, informed.

The tasks implemented varied widely and necessarily required input and support from advisers. The time scale of such input varied from a few days to up to three months. Advisers whose expertise was called upon included environmental scientists, environmental educators, technical support in the form of agriculturalists and industrialists, legal support, conflict negotiators, artists, editors, cartographers and GIS specialists. As discussed in Chapter 1, processes related to capacity building and managing input from co-workers and specialists falls beyond the scope of this thesis.

5.4 Conclusions and Reflections

This chapter has sought to highlight my evolving appreciation of the notion that participatory methods are underpinned by a range of interwoven concepts and principles, the essence of which is that the participants are seen as human beings and not as objects of research or development. Probably the hardest lesson I had to learn during this research process was that using participatory methods such as workshops, dialoguing and drawing mental maps will not automatically assure a participatory outcome. It is orientation that underpins, shapes and drives method. It was for this reason that I chose to tease out the orientation implicit in the various methods I used in each phase, rather than provide an inventory of all the exercises undertaken. Further, as this chapter reveals, I struggled with a shift from the dominant to a participatory orientation and thus, on some occasions, even as I consciously sought to use participatory methods, I was hamstrung by dominant assumptions. The context in which I used them, and the orientation that influenced my thinking at the time, shaped the conceptualisation and practice of methods used.

The realisation that I needed to interrogate my own assumptions, influences and aspirations, was central for me. It allowed me to acknowledge the need to be responsible in my use of methods by questioning what I was doing with them, why, and for what purpose. This, in turn, made it possible to engage with the challenge of misusing participatory work in order to research a thesis, regardless of its impact on the community. The process of constantly reflecting on my work helped to ensure a healthy self-critical mode that promoted accountability to the participants and to myself. It is anticipated that this chapter, in its reflection on these issues, will not only explicate the lessons learned about my work and its underpinning orientations, but will also serve to offer means by which the reader is able to examine the failures and successes encountered on my journey.

6 Phase One – Survey with Adult Participants

6.1 Introduction

Conducting a survey with adult participants marked the start of the research journey through which I hoped to come to understand rural peoples' relationship with river conservation. I further hoped that identifiable areas of concern, capacities or beliefs held by the rural people could become a means by which to motivate their active participation in river conservation. Local practices and knowledge could then inform water resource managers' implementation of river care programs and conservation strategies in the former Eastern Cape homelands. The survey was undertaken in 1996 and was the first survey undertaken in this research. The survey was concerned with the collection of local knowledge of local peoples' view of riverine management and to collect demographic and income data. The survey was my first encounter with the people from Fairbairn and Hertzog communities. During the survey collection I lived in Hertzog for a period of three months. The communities of Fairbairn and Hertzog were purposefully selected for the research as they were actively utilising the riverine resources for their farming and daily needs.

The aims of the survey presented in this chapter were to:

- provide background information on the respondent households' demographic and socio-economic characteristics, elicited through the use of structured interviews; and
- offer insight into the respondent households' perceptions and use of their riverine environment, as well as conservation practices.

After presenting the survey methods and results in this chapter, I reflect on the merits and problems of the methods used and their relationship to my research orientation at the time.

6.2 Application of Methods

A traditional survey method was used, as described in Chapter Four. The intention of the survey was to collect standardised data that would provide an indicator of the characteristics of respondents' lives, perceptions and relationship to the environment (Babbie, 1979). Further, it was hoped that the accumulated body of information would function to explain, predict and help us to understand the rural peoples' situation, with the aim of improving it (Nachmias & Nachmias, 1987). The survey was used as a tool to gain factual and attitudinal information (Nel, 1998) through verbally engaging with Fairbairn and Hertzog residents. The utility of this method of information gathering has been affirmed by Guy *et al.*

(1987): “Surveys can be used to explore, describe, or explain respondents’ knowledge about a particular subject, their past or current behaviour, or their attitudes and beliefs concerning a particular subject” (p. 220).

Surveys generally make use of structured interviews and questionnaires to describe characteristics of the larger population in the area of study. For this reason, the sample must be representative (Nachmias & Nachmias, 1987). Nachmias & Nachmias (1987) offer a range of suggestions to this end, contending that the sample needs to “be a regular proportion of the population” (p. 195). The number of households in Fairbairn and Hertzog totalled 250 and I surveyed 55 of them - equivalent to 22%. The survey was therefore representative, and the information generally applicable to the greater population. Of the 55 households that participated in the survey, of which 26 were inhabitants of Hertzog and 29 of Fairbairn.

A random stratified sampling method was used in order to ensure that all the different groups of the population were effectively represented in the sample (Babbie, 1979). Stratification methods vary with each study (Babbie, 1979). Denzin (1978) explains that the sampling method frames “the population into strata, or classes” (p. 81). This survey opted to stratify the sample according to the following criteria: 1) gender, 2) age, and 3) membership or non-membership of Hertzog Agricultural Co-operative (HACOP). This was intended to ensure an equal ratio of men to women, a balance between community age groups and a balance between co-operative farmers to independent farmers since farming is the major water user and economic activity in both communities. The survey was randomly administered by face-to-face interviews with households in Fairbairn and Hertzog in accordance with the criteria defined by the stratified framework. Thus within each strata or class, each respondent had an equal chance of being chosen.

The survey was administered in 1996 with the help of a grassroots interpreter from Hertzog. The role of the grassroots interpreter was to introduce me to the community people and to help in addressing language difficulties. The survey process required the grassroots interpreter and me to work as a team, in that I would ask questions, which were translated by the grassroots interpreter and then answered by the respondents in either Xhosa or English. The grassroots interpreter translated Xhosa responses. The survey process was intended as a method of directly eliciting knowledge or opinions from the respondents. Responses to qualitative questions relating to perceptions of the environment were recorded as qualitative prose rather than reducing them to generic results for quantitative analysis. This presented the richness of the data but reduced the opportunity for statistical analysis.

A range of writers (Nachmias & Nachmias, 1982; Babbie, 1992; Bless & Higson-Smith, 1995) have suggested that surveys administered through interviews can be categorised by their degree of structuring or standardisation, in order from the most to the least structured:

- the scheduled-structured interview;
- the non-scheduled standardised interview; and
- the non-standardised interview.

This survey made use of the scheduled-structured interview. Consistent with Nachmias and Nachmias (1987) writing the wording, order and prompts used to elicit responses for all questions were identical for every respondent. Within the administration of a scheduled-structured interview, the role of the researcher is restricted and there is limited in-depth probing (Nel, 1998). Thus this method seeks to diminish the influence of the interviewer (Bless & Higson-Smith, 1995).

The structured interview survey consisted of open- and closed-ended questions intended to elicit household data as well as information relating to community structures and use of the riparian zone. The interview covered the following three areas:

- demographic and socio-economic characteristics of the community;
- community structures and HACOP (See Chapter Two); and
- specific questions on the use and perceptions of riparian resources and respondents' understanding of their own and the community's conservation practices.

Of the 55 households surveyed, 26 participated in longer and more detailed surveys that were initially administered as part of a pilot survey. These surveys were then revised as they were too lengthy, taking up to three hours to complete. This was inconvenient for respondents as they could not spare time away from farming, cooking for their families, shopping and household work (Grassroots facilitator, pers. comm., 1996). It proved to be a difficult task to shorten the survey. With the help of the grassroots interpreter and my supervisor, Professor Nel, the decision was taken to eliminate those questions that were time-consuming, not eliciting useful or relevant data, and those that were repetitive.

Since the initial survey had been too long and had sought to elicit unnecessary detail, the removal of the above questions did not drastically affect the results but effectively halved the time required to administer the survey. The survey sample questions that were asked of 55 households are referred to as the 'total' sample and the questions that were only asked of 26 households are referred to as the 'pilot' sample (copies of the detailed and shorted questionnaires are found in Appendix 1 Box 1 and Box 2). The distinction between the 'pilot' and 'total' samples is only made where a question has 26 respondents not the total 55.

In terms of actually conducting a structured interview, Pretty *et al.* (1995) have stressed the necessity of a sensitive engagement with respondents, including appropriate behaviour and respectful attitudes. Both the grassroots interpreter and I sought to ensure that we complied with the prerequisites of sensitive interviewing in the hope that doing so would provide valuable information and create an open relationship with the respondents in which feelings of suspicion or fear would be allayed.

6.3 Results of the Community and Environmental Survey

The results detailed in this section offer a description of demographic features and environmental considerations. Data pertinent to land tenure issues in the Fairbairn and Hertzog communities and in the HACOP initiative has already been reported and reflected on (See Chapter Two).

The results discussed in this chapter take the form of percentages, which reflect respondents' perceptions and their daily lived realities. The percentage figures reflect the proportion of respondents holding a particular view or perceptions as recorded in their qualitative response. As such they are generally low. This is not intended to be in-depth statistical evidence.

It is also important to note that many of the respondents could not answer all questions. This was because the subject matter and method was confusing for some respondents. Those that did frequently gave more than one answer. These generic responses were clustered into common themes relevant to specific questions and are here reported as responses to those questions. I account for positive responses only, recognising that remaining respondents gave no answer.

6.3.1 Demographic and Income Characteristics

The randomly applied stratified sampling structure resulted in gender groupings of 49% males and 51% females in the targeted sample. Of 55 respondents 47% described themselves as the head of the household. The status of household members was an integral feature of community life. Each household was understood to have a head who was accorded that position in relation to their position, age and gender. Thus the head of the household was usually the oldest member of the household and preferably a male. That said, those identified as head of the household in the sample ranged from grandfathers to grandmothers, fathers, mothers and even, to the oldest child. The last consideration is reflected in the results in which 54% of those who described themselves as heads were also sons or daughters of the household.

The average age of the respondents questioned survey was 45 years old and 40% of 55 respondents were between the ages of 19 to 29. None of the respondents had received an education higher than

secondary school. The majority indicated that they had attended primary school and had received some secondary school education. The results showed that 22% of the respondents' had reached the matriculation class, but this result does not specify how many of those obtained a pass. Figure 6-1 illustrates the level of education obtained by respondents.

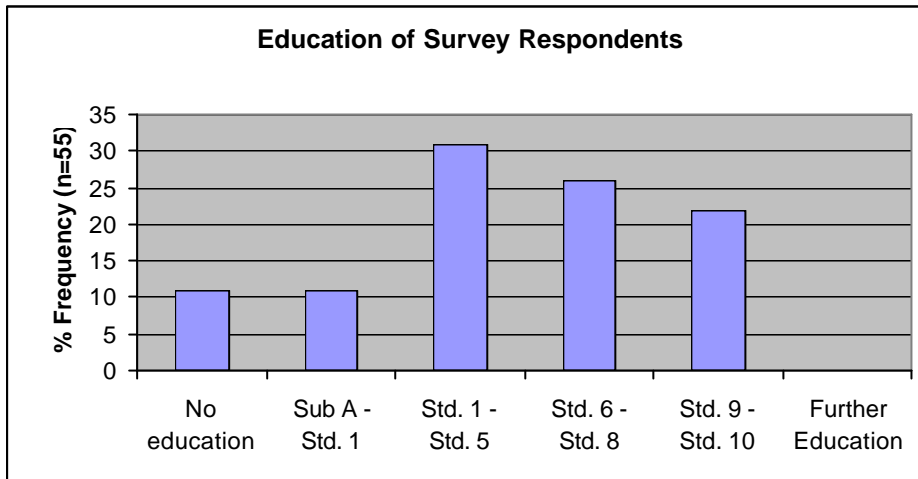


Figure 6-1 : Education of Survey Respondents

Income in Hertzog and Fairbairn ranged from 18% of the 26 respondents earning nothing, to 8% earning R3000 a month. The average income was found to be R704 a month, with the majority of people earning between R250 and R1 000 Rand. This is illustrated in Figure 6-2. The survey respondents noted that of the total 250 households, three had title deeds and HACOP had secured a land lease for a period of nine years and eleven months.

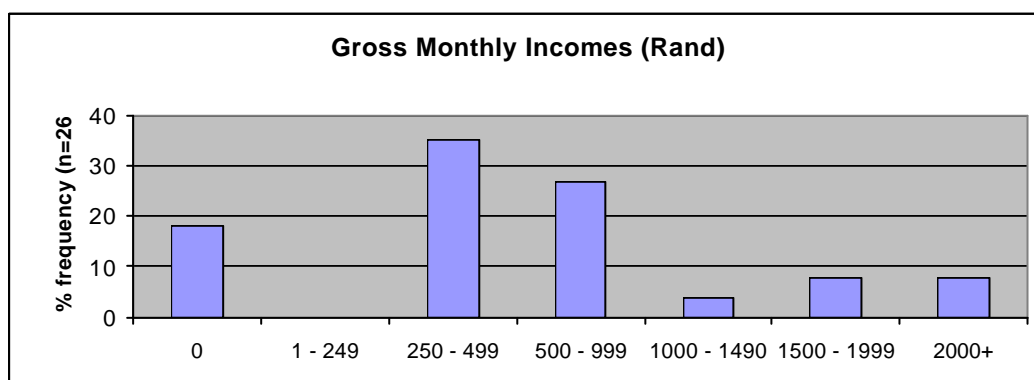


Figure 6-2 : Gross Monthly Income of Survey Respondents

Sources of income varied from self-employment (for example, animal husbandry, 25%), HACOP farmers (47%), independent farmers (13%) and employment in informal services (11%). Respondents also reported relying on other sources of income such as old age pensions (49%), disability pensions

(2%) and remittances from relatives employed elsewhere (20%). 14% of households received income from formal employment. Variations in the source of income between Hertzog and Fairbairn respondents included: informal services (21% Fairbairn and 0% Hertzog) and formal employment (7% Fairbairn and 23% Hertzog).

Political, religious and farming organisations were operational within Fairbairn and Hertzog. Of the 26 respondents questioned on these issues, 35% belonged to South African National Civic Organisation (SANCO), 73% to the African National Congress (ANC), 4% to the 'Katriviermense' Farming Co-operative and the associated church based in Tamboekiesvlei, and 47% to HACOP.

Of the 26 respondents questioned about their reliance on livestock, including cattle, goats, sheep, pigs, donkeys, horses and chickens; the average number of cattle per household was four, goats five, chicken five, sheep two and pigs two. Horses and donkeys were considered draught and transport animals. Donkeys were owned by 15% of these respondents, with 12% owning horses.

The variety of crops grown by respondent households is shown in Figure 6.3. Crops were grown independently and within HACOP, and some households cultivated more than one crop. Most grew cabbages, potatoes and mealies as these were considered suitable for the climate and soils in the area and were, therefore, considered less of a risk. A respondent explained that while produce such as tomatoes were potentially financially viable, the unpredictable seasons and river flows and lack of irrigation equipment, storage and packaging facilities made such perishable crops too much of a risk.

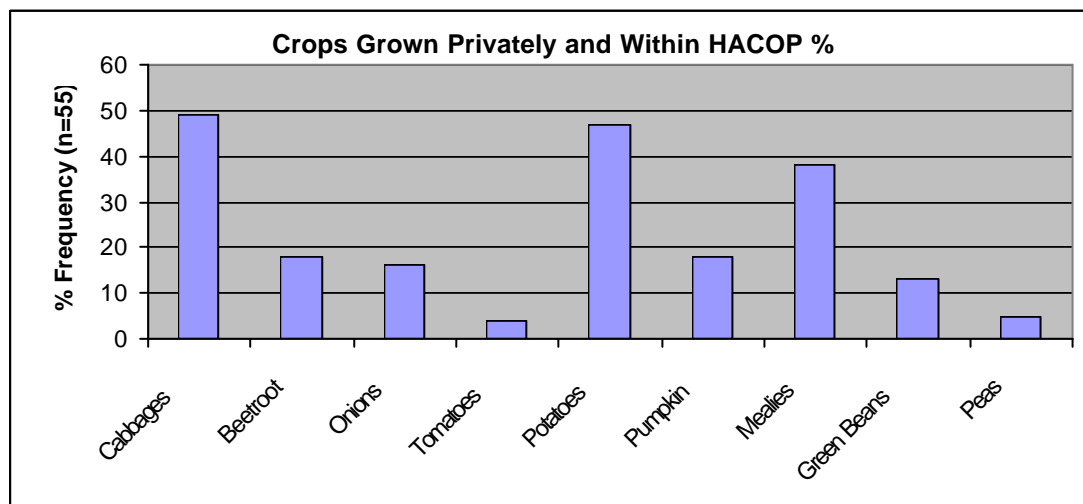


Figure 6-3 : Crops Grown Independently & within HACOP by Survey Respondents

Respondent households indicated that they sold their produce in towns such as Fort Beaufort and Adelaide. Unlike non-members, HACOP producers sold their produce collectively by hiring trucks in groups or sharing business orders. The leader of HACOP reported selling produce to neighbouring villagers and hawkers. Crops provided produce for both non-members and members of HACOP. Remaining produce was used for bartering, household consumption, feeding of livestock and gifts. As has already been outlined in Chapter Two, a lack of marketing for HACOP's produce caused financial loss as well as emotional turmoil amongst its members.

6.3.2 Perceptions of the River and Surrounding Area

Questions which focussed on environmental themes sought to elicit information on the following: sources of water; the utilisation of riverine resources; perception of the respondents' impact on the environment; desire to care for or protect the environment; and ways of caring for the environment. The results are discussed under these subheadings.

For many respondents, the survey was the first time they had ever had a 'white' person in their homes. Thus my presence was met with suspicion and anxiety, as well as hope for development possibilities and positive outcomes. The statement below is an extract from the grassroots interpreter's report. It reveals the level of abandonment that these communities faced as well as their desperate need for development.

In many cases the researcher always wanted information from the community farmers. Because of this research project there are many visitors from outside who are visiting HACOP, but long before this research project there were few people who used to visit for HACOP. This place was forgotten. No one came. Schools, people, farming here were abandoned. It force us young ones to go to find jobs in big urban areas. Now there are many researchers who are visiting for HACOP doing research work through this project. There are also professors right through this project. There are also professors right through the country who used to have visits like from Fort Hare, Wits, Rhodes and many foreign countries. As I was helping the researcher I would also like to say to the professors and scientists to their input to the community for development. Otherwise we just hope for nothing (Rangana, 1997).

The increased interaction between community members and outsider researchers placed additional stress and pressure on respondents¹⁵ who desperately sought development and improved livelihoods. The attendant anxiety and confusion was clearly demonstrated in respondents' answers in which they would

¹⁵ An article in *The Economist* reported the findings of a Cape Town study involving nearly 4 000 people. In the study it was found that "over half of all blacks thought of whites as untrustworthy, half found it hard to imagine having a white friend (only a fifth said that they had ever eaten a meal with a white person)" (The Economist, 2001, p. 42).

reply instantaneously without much thought. An example of this can be seen in the following excerpt from an interview, in which a closed-ended question was followed by an open-ended question (Hertzog respondent aged 66, Survey, 1996).

Questions: Do You Think the River and Surrounding Area is in A Healthy State?

Answer: 'Yes, the river is good'.

Question: Give Examples of Bad Pollution/Erosion/etc or Managed Area in the Community?

Answer: People chopping down trees and throwing down plastic bags. People washing and throwing away dirty washing water. Water from borehole very sour so we still using river water. Heavy rain falls on the way to Balfour get sand there and rains wash soil away. I get upset about river problems.

Many respondents hastily answered 'yes', but later gave contradictory answers when they were required to give reasons for, or comments on, their answer. The survey resulted in 40% of the respondents stating that the river is in a healthy state, while their preceding description had been one of an unhealthy river.

6.3.3 Sources of Water

The Kat River supplies both Fairbairn and Hertzog (including Tamboekiesvlei) with an all year round water supply. During dry seasons, water storage is a problem. Rain tanks and drums ensure that certain families have a summer water source. Generally, the drums are filled up with river water and transported by carts or cars. A seasonal mountain stream in Tamboekiesvlei, known as 'the furrow', had historically been a source of drinking water (See Map 1-2). Respondents reported that livestock and farming practices in Hertzog had resulted in this water being polluted and considered it unhealthy for drinking. Boreholes were sunk in Tamboekiesvlei in 1996, but these were not perceived as reliable water sources because they required fuel and maintenance. The children's perception of water sources in the area is discussed in Chapter Seven.

The survey indicated that the majority of respondent households relied on external water sources: 93% regularly fetched their water from sources outside their homes. Of the 55 respondents, 76% stated that fetching water was a daily occurrence, with 49% collecting water more than once a day. Only 6% of the respondents stated that water collection was a monthly, seasonal or rare activity. Frequency of water collection in respondent households is illustrated in Figure 6-4.

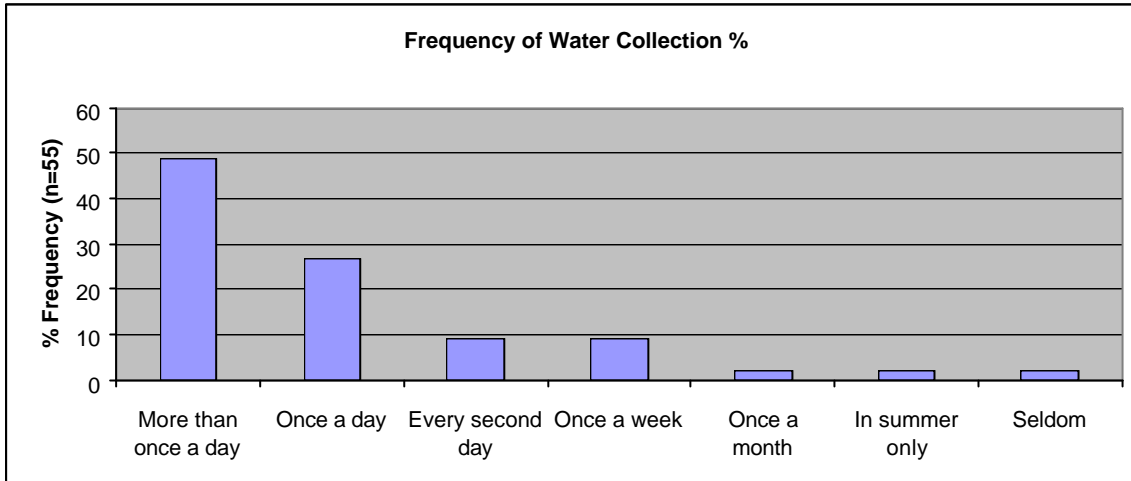


Figure 6-4 : Frequency of Water Collection by Survey Respondents

6.3.4 Utilisation of Riverine Resources

Grass, wood, herbs, stones and fish were the dominant riverine resources used by respondents in Fairbairn and Hertzog. Specific responses with regard to these resources are detailed below.

Grass: Of the 55 respondents 24% indicated that they used grass for grazing livestock, and 27% for thatching and mats. The usage of grass in Hertzog and Fairbairn were comparable, with the exception that 41% of Fairbairn respondents used grass for thatching and mats, with only 12% doing so in Hertzog.

Wood: Respondents distinguished between green and dry firewood. Green wood was described as wood ‘still growing’ or ‘young shoots’. Wood found on the ground or perceived as ‘dead’ on the tree was labelled dry wood. Respondents indicated that dry wood was good for lighting fires and green wood was good for ensuring long-lasting fires. Respondents explained that they used either dry wood or a mixture of dry and green wood. *Acacia karroo*, commonly known as ‘thorn’ tree, was utilised by 65% of the 55 respondents. A Hertzog respondent aged 64 reports on his use of ‘green’ and ‘dry’ wood: “Mix green and dry wood. I chop green and dry wood. I know it is bad just need wood for the fire. I take lots of the thorn bushes” (Survey, 1996).

Of the 55 respondents questioned 58% identified the chopping down of trees within the riparian zone as a contributor to a degraded riverine area. The respondents also identified tree felling as an indicator of poor management. Sustainable harvesting of firewood has collapsed since community rules concerning tree felling have not been observed and no new trees have been planted since the apartheid era. Cold winters and a lack of electricity required that wood be used as a source of fuel for warmth and cooking. Thus, despite the communities’ acknowledgment of their impact on the environment, the trees continued to be felled: “The trees are cut down due to the lack of money to buy wood” (a Hertzog respondent aged

24, Survey, 1996). “At home, those adults very strict. Tell us not to cut down the trees and not to chop down green trees only dry trees. These days no control now. No community rules not to cut down the green” (a Fairbairn respondent aged 44, Survey, 1996).

Although 58% of the 55 respondent households recognised that unsustainable tree felling was not good practice, only 15% respondents acknowledged the effects on the river and surrounding area. The consequences of poor wood harvesting systems were believed to be: increased soil erosion (56%), harm to habitats and livestock that rely on trees (16%), increased need to collect wood further away from home (6%), and the necessity of buying wood from those who had donkey carts or trucks to transport the wood at a cost of R 30 (4%). Statements from respondents that demonstrated an understanding of their impact on the environment included: “When people are chopping green trees and burning grass you make the soil loose so that it will be easily taken away by wind and heavy rains” (a Fairbairn respondent aged 39, Survey, 1996). “Long ago people were respecting the environment but now they take what they want. There are small animals in the river and people cannot live without the river, as each depends on each other. Even the livestock” (a Hertzog respondent aged 71, Survey, 1996).

Of the 55 respondents 15% acknowledged the delicate relationship that existed between their dependency on trees as a resource, and the supply. These respondents also believed that there was a need for better management of trees in the area. Those respondents that cared for the environment reported that while other community members often ignored their concerns, they still felt strongly about conservation: “I am depending in the environment. I am using trees for fire, so good to care (a Hertzog respondent aged 34, Survey, 1996). “We depend on the environment by chopping those firewood trees. By chopping down the trees we are decreasing the chance for the environment to produce trees at the river. Take everything for granted on the earth even grass has its major role in human life even trees have a role in human life even a stone. So just take it all for granted. I can’t live without a tree. We benefit from the tree and sand. Help us at both levels, river level” (a Hertzog respondent aged 22, Survey, 1996).

The importance of wood as a resource for building ‘wattle and daub’ houses was identified by 21% of the 55 respondents. These structures made use of two trees: the ‘Umdubi’ tree (Cape bush willow – *Combretum caffrum*) and the wattle tree (*Acacia mearnsii*), an invasive exotic tree species. The Umdubi tree is used for stabilising poles at the structure’s corners and the wattle as a flexible filler. A respondent from Fairbairn, who had built a two-bedroom house shortly before the survey was undertaken, stated that he had used 16 Umdubi poles and much wattle. With regard to the latter, the respondent was unable to give a precise number of the wattle trees used but reported that anything between 60 and 100 trees was normal.

Kraals: These are used for rituals and corralling small livestock at night and are built mostly with ‘Umnga trees’, commonly called ‘thorn trees’ (*Acacia karroo*). Specific reasons for the use of this tree included that the leaves provide a source of food for the livestock and that the thorns keep the animals inside the kraal. These trees were not considered suitable for the construction of houses as the wood is perceived to rot quickly.

Herbs: A Hertzog respondent aged 72 reported that, compared to the past, very few parents or grandparents passed on their knowledge of herbs to the youth. This statement was implicitly endorsed by the low percentage of respondents who indicated that they gathered herbs for medicinal purposes (16%). Those herbs that are gathered are listed in Table 6-1. Taxonomist Tony Dold at Rhodes University, Botany Department, provided the botanical names for these plants.

Table 6-1: Herbs Used for Medicinal Purposes

Local Name	Ailment Treated by Herb
Buchu - Khoi (<i>Rutaceae</i>)	Arthritis, stomach pains
Mhlonyane (<i>Artemisia afra</i>)	Fever, chest pains, colds, pneumonia, asthma
Rooiwortel (<i>Pelargonium antidyentericum</i>)	Backache, stomach pains, rheumatism.
Knopdagga (<i>Leonotis microphylla</i>)	Headaches, piles, pimples, colds.
Perepesi (<i>Clausena anisata</i>)	Fever.
Ukrakrayo	A mixture of herbs (camphor and ground iqwili (<i>Alepidea amatymbica</i>)) for an upset stomach.
Ihlamvu	To scare away evil spirits and make people strong (it is burnt to release smoke for inhalation – Ukuqhumisa).

Indigenous edible plants (mostly found along the river) were collected by 38% of the respondents. These were described as ‘fruit plants’ and are listed in Table 6-2.

Table 6-2 : Edible Plants

Local Name	Description
Iqunube (<i>Rubus pinnatus</i>)	Wild berry
Mbovu (<i>Rhus longispina</i>)	A wild fruit growing mainly along rivers
Mqokolo (<i>Dovyalis caffra</i>)	Eaten as a wild fruit
Isiphingo (<i>Scutia myrtina</i>)	Wild fruit that is eaten mainly by young people

Fish: Fishing was only undertaken by 9% of the 55 respondent households. Although some deep pools were reported in the vicinity of Fairbairn village, respondents articulated that they preferred fishing at the Kat Dam. However, since the Kat Dam is approximately ten kilometres from Hertzog, this is only viable for those with access to transport. The preference for the Kat Dam was also evident in the childrens’ diagrammatic responses, which illustrated the dam as a recognised fishing spot (See Chapter Seven).

A 23-year-old Fairbairn respondent showed the grassroots interpreter and me his favourite fishing pools along the Kat River. He reported that he, his brother and seven friends had been keen fishers since childhood. He then showed us the different habitats at each site and indicated that fish size and species varied according to the different river habitats. In his experience, the larger fish were caught in those parts of the river where the water ran rapidly and where there were deep pools. Smaller fish were to be found in the reeds on the side of the river, crabs in the rocky sections and eels on the muddy bottom. He listed and described the types of fish that he and his friends had caught in the Kat River: “The Blue Gill fish which was caught in the summer months when the level of the water is higher. The fish once it has been caught is dried and roasted. The White fish was a relatively small fish roughly 15 centimetres in length. The Katberry fish was considered a good eating fish” (Survey, 1996).

In discussion with the 23-year-old fisherman, it became apparent that the Kat Dam was perceived to have affected the amount and species of fish in the river. He reported that the opening of the dam gates resulted in increased numbers of fish: “Catch big fish. Get 20 a day. We make our own rods from the reeds and use the earthworms. Worms are collected near the river, on the banks. We eat these fish, dry them first. No one here sells fish, just for us to eat” (Survey, 1996).

Stones and mud: Stones were predominantly used for building houses. One respondent reported that he made ashtrays from stones. The survey indicated that 16% of the respondents removed stones from the riverbed. Of the 55 respondents, 6% used mud primarily for building houses, for pottery and for fencing.

6.3.5 Respondent Perceptions of their Impact on the Environment

This section shows that some respondents did express the belief that neglect of the environment could be attributed to a lack of formal education, and that environmental advice or education programs would help people to feel more confident, giving them the ability and knowledge to care for the environment.

The deterioration of the environment was perceived to have resulted from a range of factors. Of the 55 respondents 73% believed that humans had drastically affected the environment, and that some of these consequences were associated with actions from within and outside the village. The impacts described included: the dam, poor river management, lack of control, unsustainable tree felling, past and present land insecurity, racial prejudice in Hertzog, the belief that communities had neglected the need for human needs to be in balance with nature and, lastly, a lack of resources such as education. The respondents indicated that people in the villages altered and affected the environment in the following ways: chopping trees (54%); disposing of plastic bags, bottles and tins neglectfully (22%); causing erosion by cultivating and felling trees too close to the river (27%); causing sedimentation by cultivating and felling trees too

close to the river (18%); fertilising too close to the river (13%); burning grass (28%); collecting sand alongside and from the river (7%); allowing livestock free access to the river (9%); and throwing dirty washing water into the river (4%).

Some of the respondents believed that the Kat Dam was responsible for altering the river and the surrounding area. Most of the 55 respondents could not answer questions relating to the Kat Dam. The numbers of positive responses are therefore small, 7% of the respondents noted increased flows, with 6% noting an all year supply of water. A further 6% commented on the fact that there were no yearly floods, with 4% mentioning a regulated water supply. Respondents also remarked on the impaired water quality in the river, with 4% describing it as not 'fresh' and a further 4% noting an increase in growth of trees and bushes on the river banks.

The repercussions of poorly managed dam releases were identified as having the following impacts: affecting those people living down stream (2%), fish (2%) and blocking the culverts of the Sand Bridge in Fairbairn (4%). As the respondents described it, sand and rocks often blocked the culverts under the causeway. Thus when water is released from the Kat Dam, or when it rains, the causeway floods. Children are unable to cross the bridge and are thus prevented from going to school or are stranded at school and are unable to return home. One respondent noted that at times even cars have been unable to cross the bridge (Survey, 1996).

Of the 55 respondents 29% stated that since the departure of 'whites', there had been no rules pertaining to the river. One respondent faulted the 'coloureds' living in the Hertzog area for not using the environment responsibly. The respondent explained that the 'coloureds' chopped down trees near the river, whilst the 'blacks' tended to fetch their wood from the veld: "People burn grass near the river. Chop wood there too. In the good days, if you chopped, burn, you go to court. The coloureds now first to chop near the river and Blacks they get from the veld" (a Hertzog respondent aged 72, Survey, 1996).

Social upheaval was perceived to have had a direct effect on attitudes to conservation by 27% of respondents'. Further, 4% felt unsettled about changes in the Ciskei and new government, 11% had little reverence for or attachment to the environment and 9% felt no concern for the environment. The respondents explained that social disruption had been a feature of apartheid and its legacy was still prevalent in the current lack of secure land tenure, particularly with regard to incidences in Hertzog of 'coloured' people forcing others out of their homes. Given these issues, dealing with the environment was not understood to be a priority, as is demonstrated in the following statement: "Difficulties, people were not given good chances to stay at one place, so that movement affects them, they don't care for the environment" (a Fairbairn respondent aged 67, Survey, 1996).

The results of the survey indicate that poverty had resulted in an increase in dependency on, and exploitation of, the natural environment. It should also be pointed out, however, that lack of funds had also prevented people from buying sufficient fertilisers for cultivation. This resulted in a reduced use of fertilisers and thus less nutrient damage to the river compared with the earlier industrial agriculture in the region (See Chapter Two). The irresponsible use of fertiliser and its leaching into the river was perceived as dangerous to humans, livestock and river species by a Hertzog resident who said: “Most people especially those who have plots, don’t take too much care for the river, so that fertiliser is very dangerous to people and even to animals, mainly those living in the water” (a Hertzog resident aged 51, Survey, 1996).

The closed-ended question on perceived human impact on the environment elicited a 73% response stating that human beings were agents for impacting on and changing the environment. Of the 55 respondents 7% believed that village people were careless and had little regard for the river. The assumption that many people did not care for the river was implicitly verified by 12% of respondents reporting that the river existed solely for human needs and 11% stating that they did not care for the environment. In spite of this, 11% of respondents did not characterise the area as having environmental problems and believed that “everything in good condition” (a Hertzog man aged 72 Survey, 1996). Another respondent from Fairbairn stated: “No bad pollution or erosion”(a Fairbairn inhabitant aged 54, Survey, 1996).

6.3.6 Desire of Respondents to Care for or Protect the Environment

Of the 55 respondents 33% believed that it is important to care for the environment in order to secure the communities’ current and future environmental needs. It is necessary to point out that while these respondents spoke of a human and environmental interrelationship, they described the river and surrounding area in terms of their own daily needs, such as providing fire wood, drinking water, water for household cleaning and washing, and for farming. Only 2% of respondents acknowledged that a relationship based purely on consumption leads to environmental impairment through over-utilisation of resources and a lack of management practices. A women aged 39 from Fairbairn stated: “Because we as human beings and animals too depend on the environment. So by chopping trees we are destroying everything. In the good old days you used to get a lot of evergreen trees even along the roads but now everything is gone” (Survey, 1996).

Of the 55 respondents 15% acknowledged that they depended on a healthy environment for the successful farming of livestock. A further 8% of the respondents believed that other villagers’ misuse and neglect of the environment, in particular littering, had reduced their livestock numbers: “Since coming here

had two cows dead. When cows eat plastic bags cannot get it out found plastic inside. I pick up plastics now even on the way to church” (a Hertzog respondent aged 71, Survey, 1996).

Of the 55 respondents questioned 7% appreciated the river within an aesthetic context, a place that they and fellow villagers could enjoy. The river was described as a place with beautiful trees, especially in the summer. Some respondents encouraged me to return in the summer months to see the “green trees” and how “beautiful the river is” (Survey, 1996). A 66 year old respondent from Fairbairn stated that the environment “is beautiful, no use to kill it” (Survey, 1996). Two respondents pointed out that the poorly managed areas of the river were unattractive. A 59 year old Fairbairn resident said: “it looks nice, when you destroy it soil erosion will occur” (Survey, 1996).

The survey indicated that of the 55 respondents 17% believed that environmental protection requires individuals and the community to take an active role in environmental issues. Possible measures to protect the environment included: stop the burning of grass, implement sustainable harvesting of trees and good ploughing techniques (27%); planting of trees and grass must be enforced (9%); tighter controls on litter disposal should be imposed (18%); and environmental education should be offered for the children (6%). A further 4% of respondents believed that valuing and conserving the environment entailed community members taking only what is needed. A 63-year-old Fairbairn resident stated: “People must only use what you need from the environment, for example tobacco trees only use what need. Must not cut all” (Survey, 1996).

Of the 55 respondents 9% reported that they did not care for the environment and had no wish to protect it. In addition, the same respondents perceived the use of environmental resources as a right: “Not interested in it. Just to get wood for fuel, so I can’t say I care for it (a Fairbairn respondent aged 40, Survey, 1996). A further 3% of the respondents felt that old age impeded their ability to protect the environment: “I am old now I cannot protect it, but by collecting plastic bags in my yard and by teaching my children how to care for it, because they are going to be the parents of tomorrow” (a Fairbairn respondent aged 61, Survey, 1996).

Discussion with the respondents indicated the following: plastic bags were transported by the wind from rubbish dumps within the communities and from adjacent villages; livestock fences were in a state of disrepair along the river, and no system existed to identify responsibility for maintenance of the fences; financial resources for investing in activities to sustainably manage the river resources were limited; and few people observed environmental ethics characteristic of the past.

6.3.7 Ways of Caring for the Environment Identified by Respondents

In response to the closed-ended question as to whether or not they cared about the environment, 92% of respondents stated that they did. In spite of this, only a few respondents detailed strategies that could be used to make environmental care a reality in their communities. The survey indicated 6% of the 55 respondents believed that environmental care could be achieved individually with the support and commitment of the community people of Fairbairn and Hertzog. A further 18% thought that schools should be the key environmental educators and leaders in the community. This response was motivated by the belief that teachers have a greater knowledge of environmental management than do community members. Thus respondents regarded their own knowledge as subordinate and tended to dismiss the teaching of past generations. A Hertzog resident aged 66 stated: “Must get everything from school so I can’t teach them. If I owned land would tell children not to throw plastic. Never went to school. The school must teach them about the environment. I feel cannot tell children. Can tell the children about livestock” (Survey, 1996).

Those strategies for care of the environment that were mentioned were chiefly concerned with human behaviour, were uncomplicated and did not depend on a large financial investment. These strategies fell into the following categories: collecting and disposing of litter (40%), chasing livestock away from the river banks (6%), contour ploughing (4%), compelling children to conform to and obey environmental laws set by the community (20%), articulating environmental concerns at community meetings (13%), reprimanding people who abuse the environment (4%) and planting grass and aloes in degraded areas (20%).

6.4 Conclusions and Reflections

6.4.1 Conclusions

The standardised questionnaire administered to 55 households revealed that old age pensions contributed to nearly half of the household’s monthly income, that there were high poverty and unemployment levels and that households were mostly reliant on self-employment (i.e. animal husbandry, HACOP farmers, independent farmers and informal services).

In terms of environmental issues, results indicated that the respondents have a high degree of dependence on their environment and that some recognise the need to actively manage the river area. Results of the 1996 survey showed that respondents believed that their sustainable management of the environment had been hindered by poverty, a lack of education, insecure land tenure and social upheaval. This resulted in a sense of helplessness regarding river conservation or management issues.

The survey indicated that motivation for environmental protection was predominantly anthropocentric, relating to human needs such as safeguarding public health and protection of people's livestock. Few respondents recognised or articulated the need to preserve the environment for its biodiversity, aesthetic and cultural values. Environmental care was perceived by respondents to be constituted by the following: not exploiting the environment; taking only what one needs; preventing the burning of grass, controlled felling of trees and ploughing in the riparian zone; regulations to enforce the planting of trees and grass; tighter controls on litter disposal and environmental education for children. However, none of these environmental strategies had been firmly established at a community level because of poverty and a history of oppression. The complexity of environmental care was demonstrated by the very low percentage of respondents who answered specific questions relating to environmental management.

Bowlby and Lowe (1992) point out that deprived communities typically depend on land that is polluted or degraded and that the poor condition of the land is a direct threat to the livelihoods of those who depend on it. Poverty and a lack of economic and political power, human resources, land tenure and a lack of education make it extremely difficult for communities to take effective action. Thus the phenomenon of losing control was seen as a block to any possible environmental action or consciousness developing in the communities of Hertzog and Fairbairn.

The survey was affected by the practice of "naming and blaming" (Trudgen, 2000). This was widespread amongst 'coloured' and Xhosa respondents in Hertzog. Both these groups blamed their problems on identified groups and used derogatory terms to do so. Both accused the other of divisive, discriminatory behaviour that caused conflict. This tension-filled situation and atmosphere of mistrust resulted in the 'coloured' people withdrawing from further participation in the research without understanding the project.

6.4.2 Reflections on the Results

Initially, I believed that the focus of the research was to collect rural peoples' data for policy development and that "if [the] law is properly informed and designed, that positive progressive change" (Houtzager, 2001, p. 8) in river rehabilitation would occur. Thus in 1996 I took on the role of a researcher who would, through structured interviews and listening, capture the needs of the people. In this, I believed that by "gathering and representing the voices of poor people, ... practitioners can and do make use of this in presenting arguments for policy change" (Pratt, 2001, p. 37). The research found that most respondents were experiencing great despair and oppression and that only a few people had confidence or knowledge that could be translated into rehabilitation of the riverine area. Ultimately then, there was very little concrete information of the type useful to water resource managers.

The low proportion of positive responses to these questions can be understood as a symptom of apartheid; people were broken, isolated, deprived of education and estranged from environmental involvement. An analysis of the history of the area (See Chapter Two) clearly demonstrates that the apartheid government had absolute control over the well-being of rural 'non-whites' and environmental issues. Consequently, in the mid-1990s the village people were in a state of economic and emotional collapse, with no confidence in their environmental knowledge, no support and with little sense of security.

Living in Hertzog and visiting participants' homes in Fairbairn and Hertzog during administration of the survey allowed me to witness poverty and the resulting expressions of oppression first-hand. Community members did not have access to medical facilities, the cash to pay for a doctor of their choice, or the transport necessary to reach medical centres. In addition, the demanding tasks of carrying water and firewood as well as the stress of trying to feed many household members took a toll on their physical and mental health. Those villagers who had joined HACOP in order to farm had received a self determination from these actions, yet repeated crop failures and the lack of capital return caused confusion and frustration. In addition, rural communities' economic activity is often focussed on receiving welfare assistance which has created a dependency which has further resulted in a loss of roles and sense of self-worth (Trudgen, 2000). In his work with disempowered communities, Trudgen (2000) reports unsafe sexual behaviour; unwanted and unplanned pregnancies; negative pregnancy outcomes; eating disorders; T.B.; heart attacks; chronic headaches; diabetes; high blood pressure; substance abuse; stress related illnesses; lowered self-esteem; depression and self-harm; violence; anxiety and other forms of psychological distress; as well as difficulties in sexual and interpersonal relationships. This led me to question my role as a researcher, the usefulness of survey methods and the uses of survey results that characterise broken people. The survey results also emphasised that broken people do not have the capacity to identify and manage environmental problems - as evident in the low responses for many questions.

What the survey did show was that people in Fairbairn and Hertzog were oppressed and that guidance and capacity building was needed for IWRM to be effective. Furthermore, it was necessary to acknowledge that efforts on bringing about sustainable IWRM could not focus solely on local knowledge.

The information collected in the survey was specific to a particular area (i.e., limited to Fairbairn and Hertzog), but identified a lack of confidence in practical local knowledge for managing riverine environments. For both these reasons, the survey did not yield information that could guide water resource managers in their decision-making. The absence of rich and widely held local knowledge to

guide local water resource management made me question even further the need to change course. It was clear that local communities did not have the confidence in their local knowledge and that many believed that such knowledge was no longer applicable to river conservation. I did not realise at this point that the fact that the people lacked confidence was an important finding. I thought that the results of the survey merely reflected my inability to collect local knowledge.

Further, my experience of communicating the results of the survey to provincial DWAF staff revealed that they were not interested in an academic-driven study. The water managers were looking for ways to enable marginalised people to participate in riverine conservation. Therefore, all attempts to communicate with resource managers led to no change or little interest in my findings.

6.4.3 Reflections on the Method

Although the survey did not lead to people becoming part of the research process it did enable observation of the community's relationship with conservation practices. In this it provided useful background information for Phase Two in which the research was designed to enable active participation in riverine management activities (See Chapter Eight). Furthermore, the interviews undertaken offered an important opportunity to observe people in their social and physical setting. Door-to-door surveys enabled me to speak to respondents in their homes and thus also allowed me to meet with the respondents' family, neighbours and friends. This provided the chance to cross check information such as the size of independent gardens or the number of livestock.

The surveys proved to be time-consuming and arduous to implement, administer and analyse, even once they had been revised and shortened. Prompting by me as researcher would have been a useful tool in order to explore issues more deeply but using a structured questionnaire demanded that the researcher's role remain limited (Denzin & Lincoln, 1994). The grassroots interpreter and I sought to implement sensitive interviewing (Pretty *et al.*, 1995) which resulted in fruitful discussions with some respondents, for example, regarding the utilisation of fish from the Kat River. Given the repetitive task of administering 55 survey questionnaires, sensitive interviewing was used to protect against the disappearance of the person in each respondent. Further, I often felt guilty that I was taking up the respondents' time and that I was imposing my research on them.

During the initial administration of the survey, I experienced a conflict of 'me' going into the rural villages, collecting data from 'them', taking it away, and subsequently processing (Chambers, 1994b). This resulted in a search for other approaches that, while enabling the administration of the survey, would also offer some benefit to the interviewees. Since I hoped that the survey questions would raise issues that would mobilise respondents to take an interest in their river environment, I decided to supply literate

interviewees with notebooks and pens. This decision was informed by Pretty *et al.*'s (1995) injunction on the necessity of sensitive interviewing and Chamber's (1994b) warning against extracting information. The notebooks and pens were intended to offer respondents a means by which they could keep their own records of what had been discussed, what they had observed, and concepts they had proffered. Further, respondents were also able to make their own follow-up notes and thus not lose the valuable information they had expressed in the interview.

The survey set out to collect and summarise the data and to provide information which would allow conclusions to be drawn about rural peoples' attitude towards the environment. Thus there was a focus on the provision of information for this thesis and for water resource managers who had limited knowledge of rural 'non-white' belief systems associated with riverine management and conservation. Although the data gave descriptive background information, it did not paint a comprehensive picture. The survey presented a 'snapshot' taken at one point in time and as such provides useful baseline data. It did not capture the whole picture and reduced the complexity and richness of life experiences and beliefs. Hence it could not address all the objectives of my research. The information was divorced from the respondents' lives resulting in data that was decontextualised and unable to reflect multi-realities (Reason, 1994). Crucially, it had not considered human factors affecting the reliability of the survey, such as community feelings of inadequacy, lack of understanding of the research and feelings of inferiority.

The main aim of the research was to find methods that would enable marginalised people to become involved in river management. Thus I needed to find ways to conduct the research "with people rather than on people" (Reason, 1994, p. 12). The lack of participation of local people in the research was due to the fact that the methods used to date did not encourage people to become involved and did not provide opportunities for people to develop ownership in the research or, share and learn. The survey methods did not engage the villagers as people and was essentially doing research on 'subjects'. Therefore the survey only enabled me to elicit basic background information without local people being able to become part of a riverine rehabilitation debate. The learning and the insights gained from the process of administering structured interviews encouraged me to explore more participatory methods. In this, it was necessary to move beyond the narrow viewpoint of extracting information from local people and seek to work with the people as co-researchers. This shift in perspective raised many challenges for the research and the methods used. Thus my research did not attempt to undertake a more in-depth analysis of the survey. Rather, the information elicited served to help me fulfil my role of constructing a platform upon which to provide guidance within environmental workshops and indicate key areas of concern and conflict. I therefore used the survey results as they were - a resource for other research methods - rather than as an end in themselves.

It was of the utmost importance to acknowledge the pressures and the fears that the survey presented to people who had been oppressed and whose hope lay in the promise of development. It was also crucial for me to acknowledge that in such situations people turn desperately towards opportunities, with both hope and fear. This made me aware of the likelihood that the community's positive response and raised expectations in agreeing to participate in the survey could have had little to do with the research topic. Arundhati (1999) notes that powerless people often turn to the powerful: "They will turn to you, because you're all they have. They will love you even while they despise you. They will trust you even though they do not know you well" (p. 99). In such situations, I believe that researchers cannot assume that rural people simply 'want to participate' without considering why they may have said yes in the first place. In this, it is of critical importance that respondents understand the research, and that all parties understand what the research can and cannot do. During this research journey, I learned that I should step off my researcher's pedestal and stand in the shoes of people who have been abandoned, and not abuse their openness but rather respect and understand it.

Characteristically, the respondents believed that their knowledge and skills were too limited to be of any use in answering questions concerning the environment. Given these feelings of inadequacy, many respondents chose not to answer at all (as demonstrated by the low percentages cited in this chapter). These feelings of inadequacy, fear and low confidence were experienced as very painful and were thus not often articulated. One exception was a 30-year-old resident of Fairbairn who was inspired by a role-play that was carried out in a later workshop about administering a questionnaire to offer the following insight:

If people can have at least knowledge basically concerned with rivers and the environment, maybe they will feel good and know what to say and think. Sometimes it is difficult to communicate when you don't have the knowledge. Like this old man in the drama, I can say that he was very ashamed of himself and worried and that he did not even understand a word that the researcher lady told him. And if he was educated he may have known it. And he was hurt. He only knew how to make tea (a Hertzog resident aged 30, a community workshop 1998).

Over time and with lessons like these, I came to acknowledge how important it was that the research should offer participants the opportunity to reflect on their lives and build their capacity and confidence. This would allow a slow process of putting words to needs and gaining in the ability to identify some of the causes of oppression.

The results of the survey described in this chapter clearly indicated a need to embrace participatory methods in situations where there is oppression. The 'environmental problem' started to appear as a symptom of the local peoples' overriding sense of worthlessness, lack of control over their own lives,

inability to manage problems, and communicate. At this stage (Phase 1), I had not yet understood that these characteristics caused by poverty and oppression, would shape the research and become of fundamental importance. There was at this point, a small but crucial shift from focussing on fixing the physical resources to building the human resources.

7 Phase One – PRA with Children and Trainees

7.1 Introduction

This chapter focuses on the move towards the application of participatory rural appraisal (PRA) theory and methods to better understand the perceptions and uses of the riparian zone by Hertzog and Fairbairn communities. The chapter reports results from 9 days of PRA activities conducted with participants from the Hertzog Primary School – as summarised in Table 7-1. The research focus was the Hertzog School childrens’ knowledge of the communities’ relationship with the river.

Table 7-1 : Nine Day PRA Program at Hertzog Primary School

Day	Objective
One	<ul style="list-style-type: none"> To explain to the children the purpose of the project To introduce the children and team members to one another To demonstrate the importance to listen and work together to prevent misinterpretation To reflect on the methods, results and outputs of day one
Two	<ul style="list-style-type: none"> To create a visual record of the children’s work that they had undertaken on the previous day To understand the children’s life within their broader community structures To reflect on the methods, results and outputs of day two
Three	<ul style="list-style-type: none"> To encourage group cooperation and leadership skills To explore the children’s collective understanding of water users and where water comes from To explore individual children’s understanding of water users and where water comes from To reflect on the methods, results and outputs of day three
Four	<ul style="list-style-type: none"> To understand the condition of the river from the children’s perspective To understand the individual children’s perceptions of a poor and good river To explore the individual children’s approaches to improving the river To reflect on the methods, results and outputs of day four
Five	<ul style="list-style-type: none"> To ensure that group composition will enable children to work together To understand the children’s collective perception of the river and the surrounding areas To reflect on the methods, results and outputs of day five
Six	<ul style="list-style-type: none"> To analyse and understand what the children perceived as having a detrimental impact on the riparian zone To discuss solutions that could address negative aspects of the river To reflect on the methods, results and outputs of day six
Seven	<ul style="list-style-type: none"> To undertake a comparison of the children’s local knowledge with an Ichthyologist’s assessment of the Kat River To reflect on the methods, results and outputs of day seven
Eight	<ul style="list-style-type: none"> To explore the children’s perception of water quality To compare local knowledge and scientific knowledge of a water quality specialist To reflect on the methods, results and outputs of day eight
Nine	<ul style="list-style-type: none"> Evaluation and reflection

The research during this Phase included extractive methods based on the dominant orientation, as well as methods based on the participatory orientation. As such, this Phase straddled both orientations and marks my transition from one to the other. This transition is also reflected in the methods used with the children that incorporated a mix of data collection, analysis, participatory appraisal and education

methods. Enabling self-development and learning amongst participants was achieved during these activities by training three youth from the village to participate in the PRA program carried out over nine days with the school children. This phase of the research enabled me to experiment with use of PRA principles and tools. This chapter also seeks to make explicit the change in the style of reporting and the underlying research orientation. Finally, there is an exploration of central themes in the research process such as methods, results and reflective review.

The research aimed to assess the Hertzog Primary School children's values and perceptions of their community and the riparian zone. The objectives set were:

- to understand the children within their community structures and their level of understanding of water users and sources;
- to establish if the children were concerned about caring or improving the state of the river;
- to train volunteer community members in the principles of participatory learning in carrying out participatory research in the school;
- to employ participatory methods to improve listening and encourage team work among the participating children; and
- to compare the children's local knowledge with 'western' scientific knowledge.

It is in this chapter that there is a marked shift away from the conventions of thesis writing (See Chapter One). This is not merely a superficial change in tone and style, but a reflection of the fundamental importance of tracing the changes in my thinking. As Lather (1986) points out, shifts in thinking have profound implications for language and the manner in which data is presented. I found that my own efforts to report on such shifts necessarily required changes in my narrative. This shift also serves to illuminate the complex and dynamic interaction of theory, methods and results (Janse Van Rensburg, 1995). To this end, I use both a chronological and a reflective, cyclical structure (See Figure 4-1) to provide a deeper understanding of the research process (Janse Van Rensburg, 1995; Lotz, 1996).

A notable difference between the dominant and participatory orientations can be seen in the terminology used to describe the human beings that are studied. In the dominant orientation they are called 'subjects' or 'respondents'. Within a participatory framework they are identified as 'participants' or 'stakeholders', a term that seeks to indicate that they are active associates in the process (Chambers 1993; Dudley, 1993; Burkey, 1993).

The dominant orientation impacted significantly on my research process (See Chapter Four). It influenced the questions I asked, how I asked them and why I asked them. I set out to learn from the children and

the trainees in order to help them to communicate their local riverine knowledge and, also, to communicate my findings to the relevant government departments. Within this, I was also heavily influenced by participatory principles that stress the importance of creating a relaxed atmosphere in which all participants can learn from sharing with each other. In this case, specifically, the focus of learning was the Hertzog School childrens' knowledge of the communities' relationship with the river. I hoped that the questions posed and the joint-learning process would enable consciousness-raising, which would, in turn, allow all participants to work towards a collective education (Cassara, 1987). Thus my work straddled both dominant and participatory orientations.

I began my work with very little advice from fellow participatory researchers. I took courage from Chambers (1992a) concept of learning by doing and with the aid of Pretty *et al.* (1995) 'Trainer's Guide for Participatory Learning and Action' I embarked on learning through the process. I felt that I would only be able to understand participatory processes and see the work in action if I accepted and admitted that I needed to become attentive to my learning, welcome my errors and achievements so not to bring with me the "disease of development" (Hughes & Hunter, 1972). This was further required as I had no experience in teaching, working with children or building and working within a team. Therefore, I felt that I was entering into uncharted territory with no prior experience on which to build. This in itself presented a challenge, given that 'bottom-up' approaches in IWRM were a completely new approach in a country where everything had been decided at the top (DWAF & WRC, 1996). With this everything felt new with so many unknown factors and uncertainties that my adoption of a participatory approach seemed the most humane and sensible way to proceed. In fact, there was no other way. I needed to work with the children both to understand how participatory philosophy and methods could bring about IWRM and to find out their riverine knowledge.

As Chambers (1992a, 1994a) makes clear, the open sharing of research experiences is critically important. This sharing relies on the constant use of reflection. It was through reflection that I was, and am, able to find the courage to recount the setbacks and the successes I experienced as I strove to adopt participatory principles. It was reflection that helped me to navigate my way through the confusion engendered in the shift from an interpretive to a participatory orientation. It was reflection that enabled me to appreciate more deeply the basis of, and influences on, my research, and how these issues affected my methods. In Section 7.2 I give a brief background to the approach taken to training the trainees followed by an in-depth account of nine day research process and the attendant methods, results, reflections and lessons learned.

As stated in Chapter One of this thesis, the reason for detailing Phase One of the Children was to show how the work evolved. The active engagement in learning about PRA and working with the children at

the grassroots level provided a foundation for the adult program. Working with the children, however, was important in ensuring that capacity was built for future generations and ensured holistic programs with all groups as is documented by Motteux & Rowntree (1999) and Burt (2000).

7.2 Background on Training a Local Group in PRA Methods

Teamwork is a key characteristic of PRA working (Pretty, *et al.*, 1995). Given this background, I saw the need for working as a team in undertaking the work with the Hertzog School Children. In line with Pretty *et al.*, 1995, I believed working as a team had several advantages since a team would:

- facilitate the de-briefing of the project's unfolding aims and objectives to the participants;
- help with recording the process;
- support task and room setting-up;
- translate Xhosa and Afrikaans into English;
- ensure the unfolding program was effective and functional;
- allow work with a variety of groups simultaneously;
- create an opportunity for co-learning; and
- ensure PRA skills are left within the community.

I had successive discussions with the Hertzog Agricultural Co-operative (HACOP) community leader, negotiating the possibility of on-the-job training of local residents in the research field of questionnaire administration and participatory methods. The criteria of selection of the trainees was negotiated and agreed on by myself and the HACOP leader whereby I required people who could speak English, Xhosa and some Afrikaans. The HACOP leader wanted the youth from a community based organisation (CBO), namely South African National Civic Organisation (SANCO), to be targeted. One young man and two females from SANCO were selected to work full-time with me, as interpreters and trainees. The overall training experience was designed to develop the trainees' skills and confidence in the interaction with people in a flexible manner. As suggested by Pretty *et al.* 1995, I drew up a work contract that was discussed and explained in detail to the interpreter.

Consistent with Dudley, 1993 I found that communication blocks can manifest in several ways:

- villagers often treat outside researchers with suspicion;
- villagers may want to please the outsider;
- the presence of the outsider may encourage raised expectations of development assistance;
- often the articulate villagers dominate conversations;

- admitting to an outsider that there are problems may make the villager feel loss of face and hurt pride; and
- often it is difficult for the researcher to obtain the basic day to day information that is vital for development plans.

In acknowledgment of the many obstacles to successfully understanding the villager's relationship to the environment and their IWRM needs I worked closely with the trainees on a task to provide opportunities for communication to occur. I also encouraged the trainees to take part in the program development, implementation and reflections to encourage the trainees to question, explore and open up their stories about their environment and lives. I believed these measures were important to ensure that I could obtain information that informed DWAF's IWRM policy development. Dudley (1993) who gave the following example also encouraged this method of working with villagers:

“Working together on a shared task is an understandable context. The community infrastructure projects of the Aga Khan Rural Support Program in Pakistan are largely successful because of their simplicity. They do not require a great deal of research before they are executed. But once they are being carried out they are in themselves an excellent context for casual research. The day-to-day process of moving materials and equipment and arranging the logistics of the operation generates a wealth of opportunities for the field staff to better understand the problems and priorities of the villagers”(Dudley, 1993, p. 64-65).

I undertook the training by doing which the trainees also agreed to. Pretty *et al* (1995) states that “trainees will learn quickest, be better able to apply the key lessons to their own work situations, and understand the major advantages and disadvantages of each method, if they try it first hand” (p 78-79). Prior to each implementing work with school children, I undertook to describe to the trainees the likely exercises to be undertaken with the children. I volunteered to set up mock exercise sessions for the trainees to ensure that they would have a good understanding of the exercises, gain the necessary confidence for each school session as well as gain the skills of PRA. In addition, I compiled a core text for each trainee outlining the basic PRA methods and principles. The core text was designed as a text for the trainees to refer to in their own time and to help them understand and carry out their task. The core text also encouraged the trainees to make their personal notes and reflections.

I was the main designer and informer of the 9 days of activities that formed the school program. I had hoped that in the training sessions prior to implementation at the school the trainees would modify and inform the program and align it to meet local needs. However, with PRA being a new concept to the trainees and the time constraints brought about by the limited budget, the trainees became intent on following the program proposed by me.

A review session took place after each day's activities to discuss and highlight salient features and issues that arose in the session, to re-plan and think through the session planned for the next day. These daily review sessions with the trainees intended to provide an opportunity to discuss what went well and what went wrong and make adjustments to the method. The blocks of communication mentioned above (Dudley, 1993) surrounded these sessions which resulted in some trainees dominating and silencing others. These factors were difficult to deal with as an outsider and learner of PRA. Much of the internal friction was embedded in the trainees' personal relationships, as well as in the broader gender relationships which prevented them all participating equally in their training. This also lessened the opportunity for me to gain an understanding of their environmental issues.

The reason for choosing the Hertzog Primary School was that in the Adult survey the coloured groups living in Tamboekiesvlei were extremely suspicious of my research intention and had often refused to work with me or kept changing their story. This was partly because I was living within HACOP leader's household who saw development as inclusive of both 'blacks' and 'coloured' people. As the history of the community did not include development of both 'blacks' and 'coloured' peoples, there had been grave disputes with the majority of the 'coloureds' from Tamboekiesvlei. In addition, water related topics in the area were a cause of tension between racial groups in the communities as demonstrated by the survey results (See Chapter Six). Therefore, I believed that, by working with their children, the 'coloured' people would realise that I was not there to antagonise but was interested in their relationship to the environment. Therefore, the following aspects motivated me to work in the school: by working with the 'coloured' children I hoped that I would gain some idea how the 'coloured' groups used and thought of the environment; would establish how deep-seated the conflict was between the 'coloured' and Xhosa. For instance, asking the question of whether the Xhosa children played with the 'coloured' children would establish if they would be more open and accepting about the program. It would also establish if integration between these two cultural groups could be achieved through working with their children.

7.3 Implementing the School Program with the Trainees

Hertzog Primary School is one of two schools situated within the Hertzog area. This school was set up for the 'coloured' students. However, the dismantling of apartheid resulted in Xhosa students being accepted into the school. The school had approximately 100 students and three full-time teachers. The Headmaster, who was also employed as a full time teacher, welcomed the project into the school. He explained that he would use this opportunity to catch up on his administration duties while I worked with his grade four and five classes. We decided that I could work with the school children for two hours a day. He explained that although he would not attend the program he would be inquiring about the

program through his daughter, who was one of the 16 pupils. The ages of the pupils ranged from sixteen to nine years, with the average age being 12 years. The class consisted of seven girls and nine boys from both 'coloured' and Xhosa households from the Hertzog and Tamboekiesvlei areas. The following paragraphs explain the process used each day over a nine-day period of research.

7.3.1 Day One

On the first day, I explained clearly to the participating children that the purpose of the project was:

- to understand your community better;
- to understand the river, trees, flowers, fish, insects, better for you and your children's future;
- to teach me about your community and river; and
- to have fun while teaching each other.

I also explained the principals, concepts and methods of the project. I emphasised too that the relationships the trainees and I hoped to have with them would be very different from that of the 'everyday' teacher/student relationships to which they were accustomed. In short, the children would be the experts, and the trainees and I would be learners and facilitators.

The joint-learning process was introduced by means of an informal ten-minute lecture, which was presented variously in Afrikaans, English and Xhosa. Thereafter, the children broke up into groups and took part in a 'buzz session' so that they could express their feelings about taking part in the program. However, because the lecture used a one-way style of communication, the children's attention wandered. Also, using a monologue resulted in little interaction between the children and the speaker. The impact of both these factors was clearly demonstrated in the 'buzz sessions', where communicative input from the children was minimal.

There were a number of problems inherent in using a lecture as a form of communication in a context such as this. The first was that the children associated outsiders with apartheid experiences and this made them understandably wary. Essentially, they associated power, oppression and life-threatening circumstances with an authoritarian teaching system such as that typified by one person lecturing a passive body of listeners. The authoritarian teaching system, which was widely prevalent for many years, depended on a 'teacher knows best' philosophy (Burt, pers. comm. 1998) and on silence. It is not surprising, that the second problem engendered by using a lecture format was that the children struggled to grasp the unfamiliar notion that they were being encouraged to participate in the process, rather than playing their usual passive, silent role. These problems hindered the children from being able to guide the project from the start or give input to the process.

After the lecture, I welcomed the children as participants in the learning process through the use of introductions. These were intended to get everyone involved in talking to each other, in an attempt to break the tension and allay nervousness. The introductions were structured as follows: all the participants, including the facilitators, drew a self-portrait on a piece of a paper. Once they were finished, all the self-portraits were displayed in a row on the floor and everyone tried to guess who had drawn which picture. An example of one of these outputs is shown in Plate 7-1.

In this exercise, few of the children actually drew self-portraits. Most drew houses, cars or flowers. They carried out their work with great care, concealing their pictures from one another, and displaying them hesitantly. Attempts at identifying the person who had drawn each picture caused much amusement, which provided an opportunity to relax. Although the allocated time was exceeded, the laughter that surrounded guessing who the artists were enabled the trainees and I to record the names and ages of the participants with ease. Mirth and light discussion were of great use in relaxing the children and helping to erode barriers.

The misunderstanding over what was required in the drawings (a self-portrait rather than flowers) could be understood in different ways. For example: the children could have been too intimidated to ask for more clarity on the instructions, and/or the language barrier could have confused the issue. Furthermore, the children did not discuss their understanding of the task required amongst themselves, and the trainees chose to work separately from the children as Plate 7-2 illustrates.

In Plate 7-2 the trainees can be seen working together in a small group at the back of the class, while the children worked at their desks in the front. Perhaps a physical demonstration of what was required would have helped to address some of the ambiguities.



Plate 7-1 : Example of Self Portrait Output from Children’s Workshop



Plate 7-2 : Barriers to Communication

At this point, I construed the children’s misinterpretation and inability to manage time as setbacks, and this had an adverse effect on me. I felt inexperienced and isolated in my struggle to engage with the issues, feelings that were exacerbated by the fact that the trainees withdrew, in large part, from the exercise. I was also aware that I could create a sense of disempowerment if I pointed out to the children

that they were not drawing self-portraits and then insisted that they follow the set task. To protect against any potential authoritarian reactions, I also refrained from informing the trainees that there had been a misinterpretation of the task. In attempting to deal with these issues, I turned to the PRA principle of reflection and the challenge of being able to respond flexibly and innovatively on site. The important point is that the objective of the exercise should be met, rather than a rigid insistence on how one should get there.

Even though the time limit had been exceeded, I did not bring the exercise to an abrupt halt. Instead, I aimed to build the children's confidence and trust and not deflate them. The time lapse was included in the objective of the exercise as it allowed the opportunity to point it out to the children and encourage them to become managers of their own time and to be aware of the need to work towards time frames. This addressed the issue in an empowering manner, rather than by making them feel that they had failed in some way.

I then moved on to stress PRA principles by demonstrating the power of working together, listening and reflection. This led to exercises for debriefing the participants. This was achieved by playing a 'folding paper' exercise with three volunteers (Pretty *et al.*, 1995). Each volunteer was asked to fold paper according to my instructions and then present the end product to the class. After this, the class was questioned as to what they had learnt from the task. This time, the children's curiosity encouraged voluntary participation in the exercise. Again, however, each volunteer ended up with different results because they had not listened closely. This was tangibly demonstrated by the fact that none of the folded pieces of paper were alike. In the discussion that followed the children were shown the importance of listening carefully and it was at this point that the three volunteers expressed their sense of failure at realising their mistake.

Although it was clear during the course of the exercise that the children felt shy and incompetent, they also gained an awareness of the importance of listening and asking when they were unsure of an instruction. This particular exercise, and the learning it offered, was repeatedly reflected and recalled by the children throughout the process that followed. It was, for example, highlighted in their participatory diagramming through which they recorded their perceptions of the days activities in a diagram.

The next stage required that the participants realise and acknowledge their strengths and weaknesses. Thus the children were asked to close their eyes and think about their strengths and weaknesses for two minutes. They then turned to the person sitting on their right and discussed their strengths and weaknesses. In this way, the children came to recognise and verbalise these areas in their lives. It was found in the larger group discussion that individual strengths included listening, organising, speaking out,

drawing and assessing information, while weaknesses included being lazy, cross or naughty. Importantly, in the act of acknowledging their weaknesses and strengths, the children were able to tolerate openness and enjoy a sense of freedom in not having to be perfect. Rather, they were able to focus on their abilities, which was the aim of the exercise. The exercise was returned to repeatedly and reflected upon throughout the process in order to encourage the children to rely on the strengths of their group.

The final act of the first day was reflection on the trainees in action. This included reflection on how the trainees became involved and participated with the children, as well their interpreting and facilitating the exercises. The reflection enabled discussion around the fact that the trainees had separated themselves from the children during the drawing exercise, and that the trainees had not noticed that the children had failed to understand or listen to instructions.

I felt disempowered by not knowing whether the children had understood what was required of them. I was unsure whether the trainees were translating fully, as my explanations of the exercises seemed much longer than the interpretations that followed. Through reflection, I realised that I was trying too hard, and that I had to 'let go', particularly in my repeated questioning of the trainees: "do you understand?" or "shall we go through the process again?" I became aware that I was trying to control the process and that in this situation I had to learn to trust in the responsibility and ability of the trainees, the children and myself to work towards the unfolding plan together.

7.3.2 Day Two

The second day was structured to review key components and to create a visual record that clearly represented participants perceptions of the participatory process. This was used to reflect on, and evaluate the evolution of participants thinking during the course of the research. These acts were conceived within a context of building confidence amongst participants by 'doing'. For example, drawing a picture of the previous day's work to contribute to a flow diagram (Pretty, *et al.*, 1995) became a ten minute exercise that began the day's work together. In this, each participant was given the opportunity to draw the key themes of the previous session and so, over time, map out the process. The outputs from this exercise had value for the participants and for me as part of a record of changing perceptions and understand in a co-learning experience.

This regular review helped the participants to recall and reflect on daily activities. Initially, the children were hesitant to draw but soon it became an enjoyable exercise and one that they looked forward to each day. Each took a turn to record their learning process. They began to volunteer explanations of the drawings, and some children role-played their contribution by acting the teacher and encouraging their peers to play the children as they explained their drawings.

The gathering of information, and subsequent inquiry into it, was a rich and continuous process. Ultimately, it produced a visual presentation that effectively traced, reflected and recorded the learning path of the children. The visual method offered a graphic and tangible sense of the process's direction and impetus. Equally it encouraged reflection and recalled meaningful elements, which could be accessed later at any point in the process. For example, 'listening' was drawn as a person with big ears and this drawing was called upon whenever the concept of listening was pertinent to a discussion.

The array of pictures gave expression to the children's understanding, reflections and thoughts on the exercises that sought to help both them and me understand their lives. In this, it was important that I did not seek to intervene, but rather allowed the children to recall and represent the previous day's work. This allowed their confidence to grow.

After the flow diagram exercise I proceeded to locate and try to understand the children within their broader community structures. This I achieved with questions around where the children lived, in what kind of houses, and with whom. Further questions included the nature of their parents' occupations, whether there was interaction between households, as well as what natural resources households relied upon and where such resources could be found.

In order to elicit this information I used mental maps. Participants were divided into four groups according to the village section in which they lived. Each group was provided with pens, wax crayons and large sheets of paper cello taped together and placed on the floor, and asked to draw a map of their village section. They were encouraged to include all major landmarks, important resources and transport routes. While the participants were drawing, the trainees and I moved around the room to hold informal discussions with the children, look at their developing maps and ask questions. The participants also interviewed each other during group discussions.

The following results arose from the exercise: three of the four maps showed that there was little communication, sharing or co-operative drawing between the participants. Each child concentrated on his/her home without filling in the broader community. After some probing during the exercise, the children began to connect their houses to roads, rivers and so on. A further, and unintentional, impediment to a broader vision of their lives lay in the cello tape that joined the pieces of paper together. These lines of tape divided the paper into blocks, and in three of the four groups, each child took a block in which to draw their own lives, separating themselves from the other children. Except for adding roads after prompting, there was very little group work. In only one of the groups, the smaller one, did the children draw a picture that displayed their village as a whole.

A further problem was that the paper on the floor became messy and torn which made it more difficult for the children to coordinate with each other, especially when sheets of paper were added. Plate 7-3 shows the children holding up their drawings on the torn and cello taped paper. Throughout the exercise the children drew with care, and clearly enjoyed the opportunity to express themselves visually. During the interviews, a range of different methods was used from Pretty *et al.* (1995). These methods divided the children into pairs, with each child interviewing the other. The interview pairs were from within a group and between groups. Children were also encouraged to speak freely of their map and life situations to the class. The interviews kept the participants interested and increased their ability and willingness to communicate.



Plate 7-3 : The First Mapping Exercise

The three maps that were drawn by children acting in isolation from each other were extremely detailed. These maps expressed the diversity of each child's life and portrayed friends, cars, dogs, houses, houses with chimneys, houses with staircases, fields, fences, tractors, trees, flowers and so on. The group that had drawn their mental map collectively illustrated aspects of the village such as houses, roads, graveyards, furrows and fields appropriately and to scale. However, in this drawing there was much less detail.

The interviews supported the information drawn on the maps in that they valued their homes, families and friendship. Although the children recognised racial difference they did not perceive any racial barriers. There was no hint of tension between these two groups, either displayed physically or through their statements. They stated that they could invite any of their friends to their home. However, the 'coloured' children still believed that they owned the land of Tamboekiesvlei. No statement indicated that they had in fact sold the land to the Government and like many of the Xhosa people had no title deeds.

Both the 'coloured' and Xhosa groups observed farming and collecting water and firewood as key to their lives. However, unlike the Xhosa children, the 'coloured' pupils indicated that they farmed with tractors and used donkey carts for water and fire wood collection. There was a strong acknowledgment of poverty that brought hunger, cold and poor drinking water with a need for many after school chores. Usually, these chores were carried out in the natural environment. Yet, even through all the hardship the children talked of playing and having great 'love' for family and friends. Below, are a collection of statements concerning the children's life and relationship to their environment:

Our farm is in the Kat River Valley. Blacks and coloureds occupy it. Here there are dams built to provide the community with water. Most of the people farm with cattle, sheep and goats. The others farm with chickens. We are always friendly and polite to each other. It is very cold during winter. The frost lies white on the ground in the mornings (Xhosa pupil, aged 10 years, 1996).

Tamboekiesvlei lies south of Stockenström. We farm with sheep and goats, cattle, horses and donkeys. We use the donkeys to cart our water and wood. We get milk from the cattle. There are ten pieces of land on our farm. There are two water dams on our farm. We are very friendly with each other and Tamboekiesvlei is a private farm. There are ten of us together that live there. Our church's name is Mighty Revival Church ('Coloured' Pupil, aged 14 years, 1996).

We struggle with water and we struggle as well with wood. But the children are very good because they don't swim in the river. In Tamboekiesvlei, we struggle very much. Because some days the shops are closed and then we go hungry. And there are many houses and animal like sheep, cattle and goats and pigs. There are also rivers, dams and furrows with water. The grass is getting green. Our family is nice and the people are good. I live with my granddad (Xhosa Pupil, aged 12 years, 1996).

I like to go fishing. I milk cattle every morning. There are many donkeys in Hertzog. I like to work in the lands. I can also paint. I like doing schoolwork. I also like fish. I play rugby with my friends. I help my mother to carry water. We also play 'houses' with a doll. I love my friends (Xhosa Pupil, aged 14 year, 1996).

Even though the children were familiar with one another they were not a united team. The structural and conceptual changes to the daily school program had been disrupted. Additionally, they were still unsure of me, the outsider and were not accustomed to working collaboratively and exploring their own lives and the environment. This resulted in the pupils not functioning well together and working instead as individuals. Pretty *et al.* (1995) identify this happening as 'normal', since groups need to evolve together with the help of the facilitators. Drawing on these authors writing on group composition helped me understand that the childrens' groups were not well balanced and that they needed equal leadership skills and resources. One solution that proved helpful was to portion the participants into fewer groups.

Furthermore, the materials used impacted on both the nature of the drawings and the level of group cooperation. For example, joining sheets of paper with cello tape unintentionally encouraged the children to work as individuals, each in their own little 'blocks'. On a practical note, it was difficult for the participants to draw alongside each other without tearing the paper. Fortunately, within this less than ideal situation, the interviews encouraged confidence and co-operation and provided the first instances in which the children worked together.

As before, the day ended with a reflection on the trainees' role in the process. Each trainee had been assigned a group of children whom they had to guide through the drawing process. In addition, the trainees were encouraged to probe, record oral statements, be supportive and assist the children to be self-critical.

Reflection provided the insight that the trainees hesitated to take the proverbial 'stick of responsibility' from me. They therefore became another group for me to work with, rather than being a support. The trainees were unable to openly express their fears, any confusion regarding their roles, or discuss the factors preventing them from fully engaging in the situation. Through the mental map drawing process, however, they began to become slightly more familiar with and confident about their roles. Reflecting also elicited the understanding that the trainees needed time to understand their roles and become progressively more confident. It was only through such growth that they would ultimately be able to take ownership. Thus it was vital that an enabling environment was created.

I felt that the trainees were not giving me sufficient support, particularly in undertaking the PRA exercises. In the face of their inability to acknowledge and verbalise their fears and insecurities, the trainees' need for control and knowledge prevented them from becoming participants. I found it difficult to coordinate and encourage four separate groups of children as well as the trainees, and I felt disempowered and isolated.

7.3.3 Day Three

On the third day, the objectives were to encourage group cooperation and leadership skills and elicit the skills necessary to participate in a quiz. The intention of the quiz was to develop a tool that would explore the children's understanding of water users and where water comes from, that is the hydrological cycle. Ultimately, the children's understanding of the hydrological cycle and water users would be triangulated, crosschecked and recorded. Prior to this exercise, however, it was necessary to reflect on the difficulties encountered in the drawing of the mental maps on Day 2 and find a better place to draw the map.

Thus the process began by reflecting on the mental maps drawn by the children. From this, three groups were formed into quiz teams. The composition of the teams was undertaken by the children who selected members according necessary attributes such as leadership, drawing ability, mental agility, good listening skills and the ability to signal for attention. The group appointed leaders and selected team members one-by- one. The selection process itself drew on the group profile exercise (See 7.3.1) and led to a better understanding as the leaders grasped that the aim of the process was to ensure a team of mixed skills.

Since the structure of the quiz was designed to question the participants' understanding of water sources and water users, clues were provided to unknown concepts such as 'catchment'. Points were awarded to correct answers, which were then drawn onto a piece of paper fastened to the wall. The children's answers varied from 'I don't know', to being able to give an answer to a question asking where water comes from. The following are the questions and cues posed for the quiz.

Question 1. What is the hydrological cycle?

Answer: unknown

Question 2. What is a catchment?

Answer: unknown

(clue) What surrounds the community?

Answer: Mountains

Question 3. What is inside the mountains

Answer: Trees, grass, river, bridge, toilet, buildings, people, water tank, livestock and flowers.

Question 4. Where does the water come from

Answer: Rain, Kat dam, river, snow, groundwater, taps, water.

Question 5. Who uses the water?

Answer: Livestock, people, fields, tanks, sun.

I had also come to realise that the children needed room to move and a good surface to work on in order for the mental mapping to be effective. Both these factors impact on the facilitation of group work. And since, as Pretty *et al.* (1995) points out, PRA exercises can take place in varied environments. I obtained permission from the headmaster to work on paper that was fastened to the outer classroom walls. This enabled the children to be able to move, and thus co-operate, more freely. Co-operation was also improved by the restructuring of the groups. Their leaders were confident, spoke easily, listened well, encouraged decision-making and were able to elicit contributions from their peers. The children's work, in both its pictorial and written features, was a highly effective display of their understanding of the hydrological cycle, how water is used and the relationship of water users with the river. It also served as a source of triangulation for my research.

Once the children's knowledge had been expressed and communicated, it was placed into the context of their lives. Using a known reality assisted in drawing an association between water-related concepts and the water users, livestock, people, fields, toilets, vegetation and household images with which the children were familiar. Scientific words caused confusion and impeded the process. The drawings done at this stage were compared with illustrations done previously in the community map, and were found to offer similar characteristics and features. My experience of participatory methods such as these is that they are a useful tool for practitioners and resource managers in contexts in which it is necessary to access and generate collective knowledge.

Homework task sheets (See Appendix 2 Box 1), written in Xhosa and English, were handed out at the end of the day. These required the participants to draw and write up the session. A list of questions and answers was also provided. This covered concepts such as the hydrological cycle, catchments, the community, mountains, the source of water as well as who uses it. As regards the setting of homework, this was intended to allow each child an opportunity to express their feelings, observe their own lives and reflect on both. This was complementary to the work done in groups. Lastly, the children's homework provided a valuable means of crosschecking and an opportunity to form their own individual ideas, as they could find a space outside their home to think and reflect on their experiences. The homework scripts captured the children within their home environment, also giving some insights to their relationship to their parents.

The majority of children sat outside their home and looked at their environment as they drew and wrote. Unlike their drawing in the class room, much of the homework statements were disconnected statements that did not explain the full hydrological cycle. The homework enabled the children to think about the different water users that occurred outside their own back door. Their writing indicated that much of the community tasks took place in the outside environment. Below, I have presented some of the written homework (See Appendix 2 Box 1 for further examples of written answers):

First I drew the house. Then I drew the tree. Then the river. Then again the lands. Then the mountain. And the tar road. And the school. And the birds. And snow (Xhosa, aged 12, 1996).
Our church stands before the door. The mountains are very high. We have chickens, small stock and large stock. The bakkie is in front of our door with children on top. Alongside the church is a tap. There is also a road next to the church. The dam is over the road. My friend's house is the other side of the dam. There are also trees by her house. I see also a boy that is kicking a ball. The sun is shining high in the sky. There are also many clouds above. The toilet stands next to the church ('Coloured' pupil, aged 10, 1996).

I see a huge mountain. There are many trees with green leaves. And a windmill and a dam alongside. And other land that is being irrigated. I see clouds in the air. Birds are flying in the sky (Xhosa pupil, aged 14, 1996).

An example of what participants produced from these homework sheets is presented in Plate 7-4 which shows a child's perception of the hydrological cycle. As this example shows, the childrens' drawings were extremely detailed with 47% displaying the hydrological cycle in their own context, as shown in Plate 7-4. However, 67% of the childrens' drawings clearly displayed water flow as seen in Plate 7-4 where the rain and snow caught in the catchment feeds into a river system and the underground water supply which both feed into a dam. This water is then piped through irrigation system onto a cultivated field. Other drawings showed water flowing from taps, rain tanks, irrigation pipes as well as from a bucket onto the land.

In a further exercise, I asked the children to note the different sources from which they could collect water. Through discussion the children told of varied sources of water that can be collected for human, livestock and cultivation purposes. The following written statement explains the different sources of water and their uses:

Our church is in front of our house. We have a big house .We also have a big garden. The dam is also near us. We get our water from the big dam. It is very tasty. We have taps in front of our house ('Coloured' pupil, aged 14, 1996).

UMSEBENZI WASEKHAYA:

IGAMA: *Flagan Steed*

1.

HLALA NGAPHANDLE KWENDLU YAKHO UKUZE UQWALASELE KAKUHLE
UMNGQAMEKO LWAMANZI, IINTABA, UMLAMBO, IMITHI, AMASIMI,
IZINDLU.

Zoba oko ukubonayo.



Plate 7-4 : Example of Child's Perception of the Hydrological Cycle

On reflection, I found that through drawing the children were able to understand and explore the concept of the hydrological cycle in their own context. This was important as only 13% of the sixteen participating children managed to capture aspects of the hydrological cycle in their writing compared to 47% who were able to capture it through their drawings. It was clear that 81% of the pupils had dedicated time and great thought to their pictures in contrast to the one or two line written explanations of the hydrological cycle.

In addition to the drawing of the hydrological cycle, these drawings captured immense detail of community life in the village. For instance 50% of the sixteen houses drawn had chimneys indicating that most houses were dependant on fuel wood for heating; 81% of the participating children drew their houses in the centre of the page and as a dominant feature indicating how central the homes were for them. Some 69% of the children drew their homes connected to other homes indicating the village life. In addition, 19% of the drawings had pit latrines; 63% of the drawing had people doing chores and 19% showed people visiting one another. Some 31% of the drawings had water tanks, 25% had stand pipe taps, 50% had a river and 25% had small dams indicating some of the different sources of water. In addition, 56% of the drawings had roads; 69% showed fields being cultivated; 13% drew livestock; 75% drew trees, flowers and grass; 88% drew mountains that surround Hertzog and Tamboekiesvlei area; 69% of the drawing displayed weather elements, such as rain, sun, snow and clouds. These aspects expressed as percentages provide insight into the lives of the children in their village and environment, which had also reflected partially in the community mapping exercise of Day 2 (See 7.3.2).

The daily reflection of the trainees in action covered their work of translating the quiz questions into Xhosa and Afrikaans as well as their record keeping of the quiz scores. Within these responsibilities, it was clear that the trainees were beginning to trust themselves and, thus, were able to work more effectively as a team. This was borne out by the ease and comfort with which each trainee took on their role. Consequently, I felt more at ease and was able to work better with the children.

7.3.4 Day Four

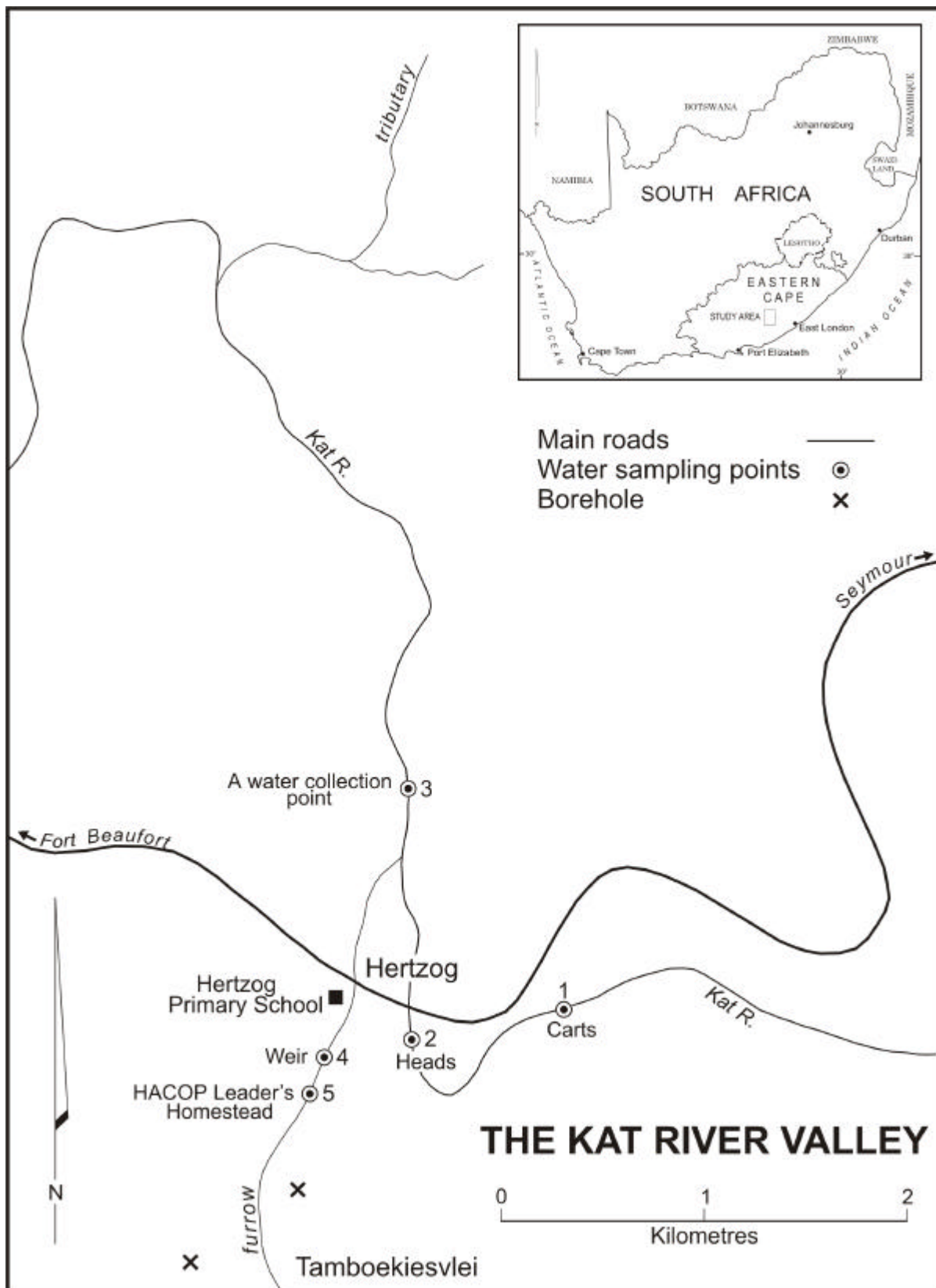
The objective of the fourth day was to understand the condition of the river from the children's perspective. This was achieved by means of transect walks (Pretty, *et al.*, 1995) which made use of two accessible furrow sites, namely Weir (Site 4) and behind HACOP leader's house (Site 5) (see Map 7-1). On site, the children were asked to fill in a worksheet specifying where they were, what they saw and which factors they understood as good or bad for the river. The words of the task questions were as follows: "Record your 1) location, 2) observation and, 3) judge your observation, if it is good or bad

for the river and the surrounding area” (Worksheet, no. 1, 1996). These questions were translated into the languages used by the school children and were provided to them in such a way that they could choose which language they wanted to use. This exercise was allocated a time period of one hour.

The intention of this exercise was for the children to observe aspects of their riverine environment, which could be used to establish the management status of the environment. They could then establish whether or not the riverine environment is in a good condition or not, and ask why? With regard to the above worksheet, the third question proved to have been badly phrased and was thus vague and unclear. This resulted in six children ranking the objects observed according to size, as well as not noting the condition of the furrow. Thus the results presented as percentages of the aspects of the riverine environment that are recorded below are taken from a sample of ten respondents and not the full sixteen.

A range of elements was identified at each site on the river. Although the elements were fairly similar at both, the children’s perspective of them differed. For example, stones, livestock, cars, pipes and farmers were perceived as either good or bad. The majority of the children saw farming-related elements as good, as is demonstrated by the fact that 50% of the participants characterised the fields near the weir as good. A group of children working together said: “It is very good. Men plant to live.” (Transect Walk, 1996). In terms of water quality, 60% of the sixteen participating children perceived the water as dirty and said: “Bad, because the water is used for drinking” (‘Coloured’ pupil, aged 15, 1996).

The homework exercise asked the children to “Look at your worksheet showing your recordings of the ‘good’ and ‘bad’ aspects found at the weir and behind HACOP leader’s house. 1) Draw a ‘good’ river and a ‘bad’ river. 2) Record what things you could do to improve the river better?” (Homework no. 2, 1996). The transect walk worksheets correlated with the homework drawings. Again, children presented features of the environment as good as well as bad, such as field cultivation. Fifty- six percent of the children volunteered to use colour, different colouring mediums (for example a pretty use of colour verses dark monotone colours) and method (for example bolder verses petite drawing, or precise verses scribble) to illuminate the features in a good or bad context. The children used these drawing techniques to illustrate the difference between the ‘good’ and ‘bad’ aspects of the environment and highlighting some reasons why. For example a Xhosa pupil aged 14 used a tree in two differing contexts. Firstly she drew a good tree bearing fruit surrounded by flowers, grass and birds drawn in greens and reds as opposed to an old tree falling into a river all coloured in browns with a little bit of yellow added to the small river.



source: Modified from Nel, 1998.

Map 7-1 : Location of Hertzog Primary School and PRA Activities

The drawings of 69% of the sixteen participating pupils illustrated that both graves and river animals such as frogs, crabs, eels and 'legavans' (large local lizards) were 'bad'. The majority of these drawings were verging on the grotesque and frightening. The 'legavans' with large teeth, crabs large and the river water roughly scribbled in with no colour. Although a high percentage (56%) believed river animals to be bad others did not, for example, "we must not kill the bugs that live in the river" ('Coloured' pupil, aged 10, 1996). The graves also had solemn presence depicting numerous graves with one of the pupils drawing a person within the grave. Through this period of working with the children I was living in Hertzog where I observed death was part of community life as funerals were undertaken in the village and all people were invited to attend the burial ceremonies.

The written homework showed that the children used their transect walk worksheets to explore management practices. Environmental features that the children chose to write about matched those that they had recorded as 'good' and 'bad' aspects of the environment. The example illustrated below compares the elements described in one participating pupil's worksheet of the transect walk and her homework written description:

a) The pupil's worksheet of the transect walk

At the Weir

Good: Cow, trees, pipe, grass, birds, fields,

Bad: Stones, grave yard

Behind the HACOP Leader's House

Good: trees, weir, fields

Bad: Reeds, tree stumps, stalks, frogs

b)The pupil's homework written description

Cows are good because they give us milk and meat. Stones are bad because people can fall over them. Trees are good because we sit in their coolness. Grass is good because we can play nicely. Birds are good that sing nicely in the trees. Lands are good because we can plant vegetables. A weir is good, we can swim there when it is hot ('Coloured' pupil, aged 10, 1996).

From the above, the children started using their own information they had collected to use in their analysis. Solutions to bring about a better environment were noted by 63% of the students, of which 57% implied that they were part of the implementation of the solution. The children using words such as 'I' and 'we' as opposed to 'you' or 'they' demonstrated this. This illustrated a start to the children feeling that they had the power, skills and knowledge to make the environment a safer and better place to live in, as

illustrated by some of the quotes of the children's homework given below. The last quote illustrates the pupil talking as actively being involved with actions to care for the environment.

We can keep the river clean. We must not throw dirty things into the river like papers, plastic and other things. Don't throw pieces of bottle in the water. It is unhealthy. The water will become bad if someone messes in the water. The river is the most important thing in a person's life (Xhosa pupil, aged 14, 1996).

By Kat River we are not allowed to make dirty. We can not throw in dirty things. We may not swim or play in the water. We may not wash washing near the river. The river can be very dangerous when it is full. It is dangerous to walk on slippery rocks and near to potholes. The river's water can be very useful, for example, the lands can be irrigated as well as used for household chores. The Kat dam is situated on the Kat River ('Coloured' pupil, aged 10, 1996)

My friend and I like to keep the river clean. We pull all the dirty stuff out of the river. Because the people use the water. They use it for good things. We pull out all the papers, plastics, branches and lots of other things. We pick up everything that makes the river bad. And we also make everything clean that is in the river that makes the river bad (Coloured pupil, aged 15, 1996).

Illustrated in the written and drawn statement from homework (one and two) the children see their environment as a living environment. They have constant interaction and engagement within their environment. They play in the environment, they collect their fuel and water from their environment (even the stand pipes are outside the house), they farm and collect edible food stuffs outside their house, they are constantly walking through their environment to visit friends, shop or going to school (i.e., they do not get in a car, nor phone, nor email).

With so many activities taking place outside the home (i.e., within the homestead) the children viewed this immediate environment surrounding their home as part of their home. The majority of the children's drawing showed the area outside the house as very active and often with a chicken or goats. During discussions the children stated that generally families who lived in solid brick structures cooked within the home and collected water from a nearby stand pipe. This was in contrast to those who lived in the traditional 'wattle and daub' structures, who cooked food outside the main house and collected water from the river. In this case, the children's life experiences were seen to be highly interactive with their environment and were directly associated with the type of house they lived in.

Throughout the transect walk exercise, all the children observed the riparian zone with attention to detail and worked with great care. Some worked in groups while others worked individually. There were those that walked up and down the furrow, whereas other chose to sit and observe their river. The last is illustrated in Plate 7-5, which shows a boy looking with great concentration at an irrigation channel near the river (known locally as “the furrow”). Important decisions such as whether they wished to work singly or in groups, as well as how the work should be carried out, were made by the children themselves.

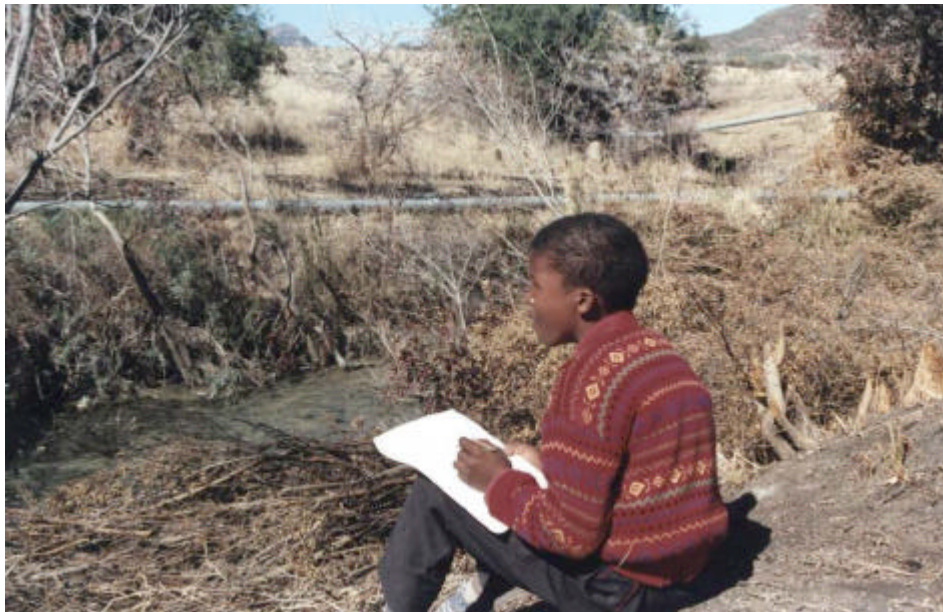


Plate 7-5 : Child Observing the River “Furrow”

During this exercise I felt that the children enjoyed being outside and observing their environment. This perception was validated by their worksheets, which indicated that they were beginning to see the world around them in a new way. I gained a real sense of satisfaction from this which, in turn, allowed me to feel more relaxed and able to enjoy and appreciate the transect walk. Also, since we were all beginning to work together, I was able to concentrate on facilitating the work of the children with energy and without feeling constantly pressurised by time constraints. This welcome shift was recorded thus: “Today I felt at ease. Learning to trust in the children and I realised that I am not alone, the children and trainees are part of the process” (Diary, July 1996).

The objective of the exercise – to understand the condition of the river from the children’s perspective – was well served by actually being in the children’s riverine setting. This context made it easier for the participants to identify with the concepts and issues they were being presented with. Over and above providing tangible cues for issues of concern, the setting also encouraged the children to convey their knowledge by means of sharing and broadening their knowledge by asking questions. Their ability to do

the first served to increase their confidence as their insights were accepted, thus reassuring them of their own judgement regarding the environment. Equally, the on site observations enabled the children to understand the value of working towards environmental care, and underlined the importance of discussing these issues. Furthermore, being in the riverine setting encouraged a focus on farming as well as water collection and consumption, which clearly indicated the children's awareness of the centrality of these features.

With regard to the six children who had completed their worksheets differently, I believe it is inappropriate to characterise their work as simply 'wrong' or 'mistaken'. A close analysis of their work revealed that each of these children had thought carefully about their environment, investigated it and, importantly, felt fulfilled by their exploration. These considerations were critically important and serve to highlight that PRA is not fulfilled by a pedantic insistence on exactness.

The day ended, as usual, with a reflection on the trainees' work in action. In this, they had been required to be equal participants in the exercise by filling in the worksheets and detailing their observations on site. I noted that the trainees had begun to relax and thus had moved from a self-consciousness about themselves to thinking about their environment. And although it was clear that they still felt superior to the children, in this particular exercise the trainees withdrew from their roles as facilitators and simply filled in their worksheets alongside the other participants.

With regard to their worksheets, the trainees had successfully understood the third point (the one that had caused some confusion amongst the children) because a pre-planning discussion had been held. Their worksheets identified the observation of a range of elements within the riparian zone, these elements being fairly similar at both sites. High scoring was attached to those elements perceived as good, such as trees (68%) of the three participating trainees and farming-related items such as pipes (68%) and livestock (68%). The trainees collectively identified erosion (68%), old car bodies (68%) and rubbish (100%) as negative elements. Emphasis was placed on the need for farming, trees, and a clean and tidy area. The trainees expressed the belief that their voice was important and necessary in discussions concerning the condition of the environment and that the exercise had encouraged them to open their eyes and become critical of their surroundings.

Despite the fact that the trainees had, in this exercise, withdrawn from their role as facilitators I felt encouraged that the children had started to become participants and keen learners in the process.

7.3.5 Day Five

On the fifth day, my objective was to understand the children's collective perception of the river and the surrounding areas. Given the lessons I had learned on Day 2 I reflected again on group composition and how best to ensure that the exercise would take place in a setting conducive to active participation. I reflected particularly on the fact that, out of the three groups organised for the quiz, only two of the groups had formed successfully and the third had collapsed. This last point was addressed by means of negotiation that sought to ensure that the children would designate key role players, leaders and listeners more fairly.

From this, each group chose whether they wished to study the Kat River system or the furrow. Then, working on separate sheets of paper fastened to the outer walls of the classroom, each group compiled their understanding of the riparian zone along the system they had selected. This understanding was informed by the recordings they had made during their transect walks. The children were encouraged to plan their drawings before they began in order to have a correct perspective of the river system. The time allotted for this task was one hour and the trainees and I interviewed the participants while they drew.

Throughout this exercise I observed that the children were beginning to listen to each other and work together, which strengthened their group commitment and increased their enjoyment of the task. In fact, because their group coherence had improved, the children experienced our attempts to interview them during the exercise as confusing. The participants were heavily involved in discussing their maps amongst themselves and our questions intruded upon and interrupted this process, which prompted the trainees and I to stop questioning. Generally, the children were self-contained and focussed and very little probing was required.

As had been requested, the mental maps were carefully pre-planned. This was demonstrated by the fact that they properly illustrated a longitudinal river system flowing through the landscape, passing houses, fields, roads and schools and running beneath a bridge. The maps were filled with the children's practical experience and displayed their local knowledge. Precise elements were located appropriately and in great detail, and colour and text were added to abstract images such as fields. The river was intuitively displayed as a whole system with the water and resources indicating the riparian zone. When asked what the river was comprised of, the children replied "water" (Hertzog School, grade 4 & 5, 1996). After completing their representation of the environment, the children articulated that they felt pleased and satisfied with their efforts. A common feature of the maps, verbal exchanges and homework of Day Four was that each indicated that the children's lives were closely connected to, and dependent on, their environment. The environment was understood as a place of collecting daily resources, that it was valued as beautiful and as a place to play.

Plate 7-6 shows the children talking about of the Kat Dam. The two pupils both aged 15 keenly explained that the Kat Dam was a popular place for catching fish. The ‘coloured’ pupil spoke of his uncle frequently fishing at the dam wall catching eels. The other pupils talked of a picnic site at the dam wall that they frequented for Christmas and New Year. From the discussions, they stated Seymour was situated on the opposite side of the dam wall. Seymour is a small rural service centre where there is a hospital and shops. However, they stated that they “get the rubbish of Seymour, even dead people” (Hertzog School, grade 4 & 5,1996).



Plate 7-6 : Children Talking about the Kat Dam

Pretty *et al.* (1995) encourages practitioners to ask probing questions during the drawing of mental maps, but also points out that methods should not be applied systematically in any situation. In this instance, questioning the participants during the exercise was not helpful. Consequently, I decided that each group should take turns in presenting their completed work to everyone. This decision resulted in there being only time for ten minutes of questioning before lunch.

As events in Days 2 and 5 in particular showed me, group composition is a factor that needs attention in order to ensure optimum learning. Continuous evaluation and negotiation is important throughout participatory work, and working in groups should be understood as a dynamic process. Forming groups encourages learning with others and lessens the ability of stronger participants to ‘cover’ for those who are less confident. This ultimately allows children to become part of the team in their own right. The power of the PRA approach was becoming more and more evident as the children began to relax and work together, and surrender their notion of me as an authoritarian teacher. This in turn allowed them to be less passive and share their knowledge with more confidence.

The days work ended with a reflection of the trainees in action. Their task had been two-fold: to translate the methods for the children, and to facilitate the map drawing and interviews. The trainees fulfilled both these tasks well. As the PRA processes became more familiar, all participants worked better together and facilitation became easier in some respects. That said, the path ahead was by no means straight or signposted. Restoring or rebuilding shaky confidence is a gradual process that takes time. It cannot be dictated by outsiders, only realised by those who undertake it.

7.3.6 Day Six

On Day 6 I aimed to firstly analyse and understand the elements that the children perceived as having a detrimental impact on the riparian zone and secondly discuss solutions that could address negative aspects of the river. The work sites and composition of the groups remained the same as the previous day.

The first exercise required the children to draw their perceptions and understanding of 'bad features' of the riparian zone explored during the transect walk along the furrow and for those who drew the Kat River to recall, share their experiences and observations to assist their drawings. This was followed by group feedback about these features and a discussion of possible solutions.

Group 1 characterised 'bad features' by drawing jaggedly and in darker colours. These pictures were intentionally 'ugly' and chaotic and were in contrast to the previous day's map of the furrow that was beautifully decorated with flowers, grasses, birds, smoke coming out the chimneys and people having picnics (See Plate 7-7 and Plate 7-8). However, the images of Day 6 were still precise in sequence and in their representation of the environment. This group also recounted (both verbally and visually) that the water was green and filled with tree stumps, stones, plastic bags, dead trees, rubbish, fallen birds' nests and burnt grass. This group also noted that animals were not good for the river. While Group 2's drawings were not presented with any disfiguration to portray negative aspects, their illustrations also identified cars, stones, tree stumps and green water as 'bad features'. Overall, these maps showed incredible detail and knowledge. The children were clearly able to recognize elements that were negative and/or deleterious. They did, however, find it difficult to identify and discuss possible solutions to these problems.

In order to elicit their solutions, I asked the children, still in their two drawing groups (i.e., the Kat River and the Furrow), to write a range of environmental practices that could be understood as harmful. Table 7-2 shows the list of harmful environmental practices found in the local context recorded by participating children on a sheet of paper. The children found it easy to depict the problems but struggled to make the shift towards finding solutions. They remained preoccupied with what was 'bad' and returned repeatedly back to the problems, rather than towards possible solutions.

Table 7-2: Children's List of Problems without Solutions

Group One (Kat River)	Group Two (The Furrow)
Green water	Cars in water
Tree stumps	Stones
Stones	Tree Stumps
Plastic bags	Green Water
Dead trees in the water	
Rubbish	
Birds nests	
Burned grass	
Animals	

I reflected that drawing was a tool that the children had become comfortable and confident with. Therefore, I shifted from writing to collective brainstorming and drawing in search of possible solutions to the problems they had listed (See Table 7-1). Again, the Children focussed on problems that were grounded in the local context and included littering in the river, people swimming and the chopping down of trees – as shown in Plate 7-9. There was one exception, a child drew two people to signify the importance of communication and that it was through communication that solutions to riverine problems could occur.

In this exercise, a standard PRA exercise did not assist the children in making the transition from understanding their environment to thinking about possible ways to change it within their own context. I came to doubt whether they would be able to make the shift and, consequently, I felt powerless. I came to understand later that it was only through using standard PRA in combination with Theatre for Development, to enable their transition from attitudinal change to behavioural change that the children could actively engage with the solution and become active in environmental care (Motteux *et al.*, 1999).

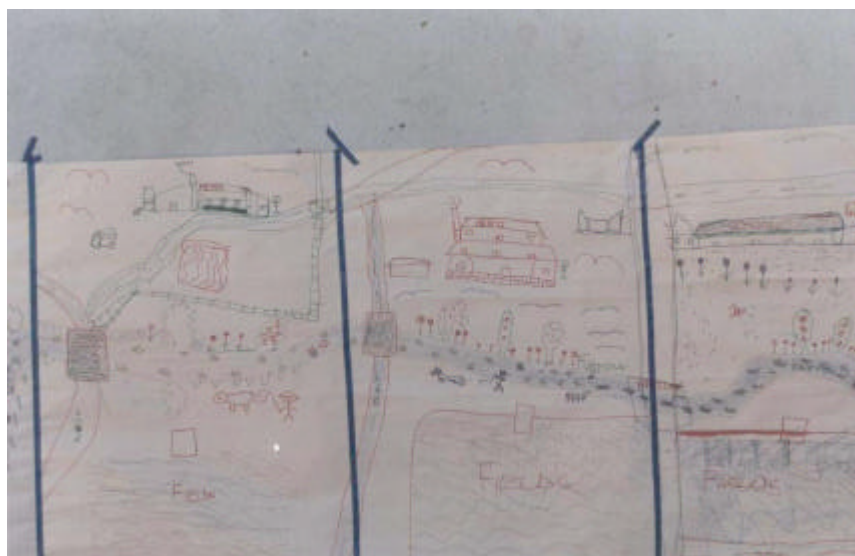


Plate 7-7 : Day Five: The Healthy Furrow

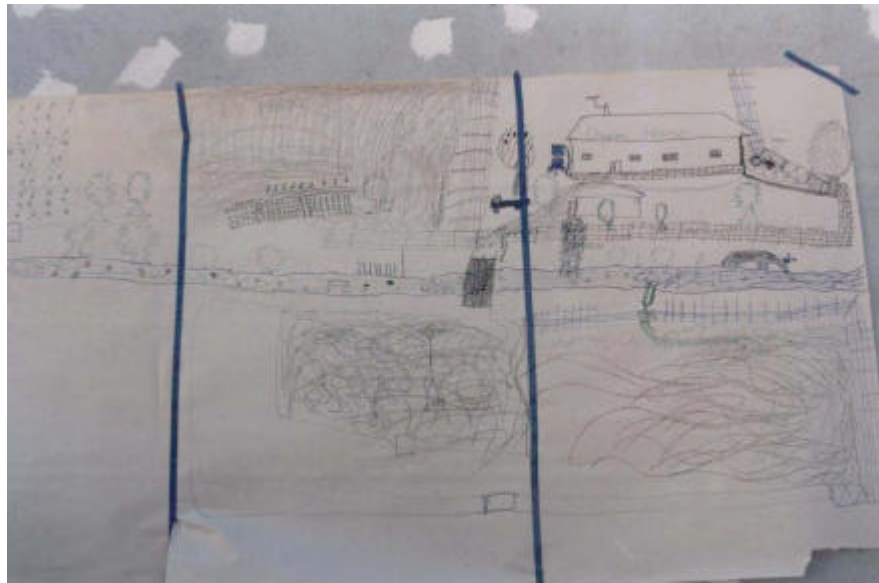


Plate 7-8 : Day Six: The Unhealthy Furrow

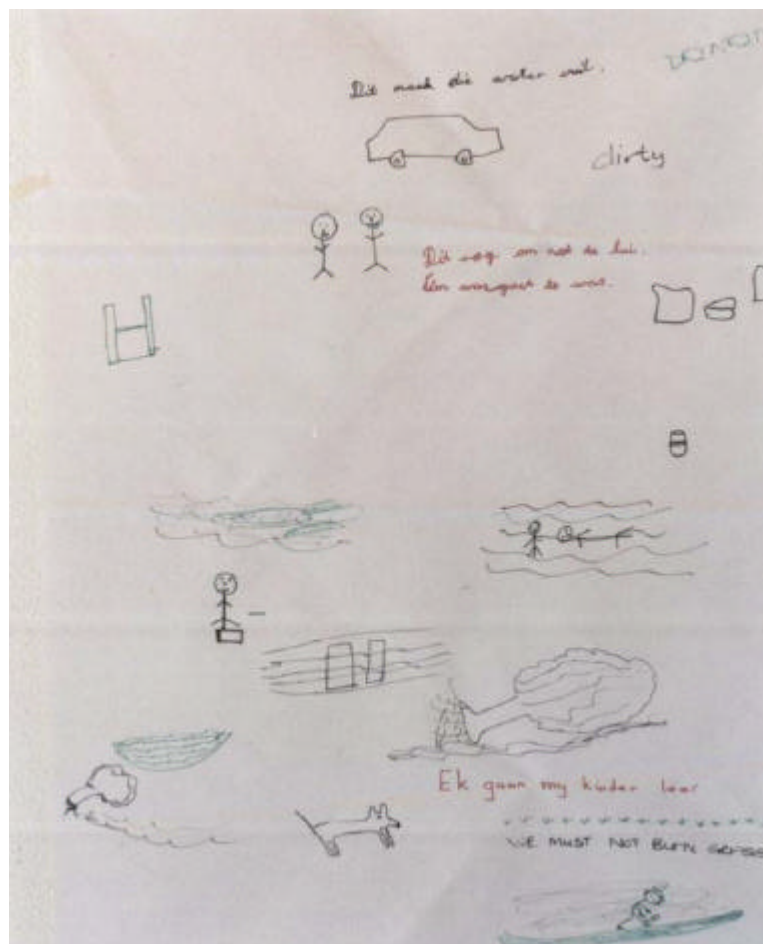


Plate 7-9 : The First Solution – Communication

Reflection of the trainees' work covered their communication, facilitation and recording of exercises. Within this, each trainee took on the role that they felt most comfortable with, either as facilitator, translator or recorder. Being able to make a choice based on their own perceived strengths and then working with those strengths empowered the trainees to function as a complementary team. This enabled the process to run more smoothly than previously.

7.3.7 Day Seven

The objective of Day 7 was to undertake a comparison of the children's local knowledge with an Ichthyologists' assessment of the Kat River (Hertzog). The first exercise, an evaluation of the fish in the river, sought to involve the children as active participants. With this in mind the scientists were encouraged to interact freely with the children by describing and discussing their aims and objectives – which were to evaluate the fish communities in the river.

An unexpected participant was the headmaster of the school who arrived voluntarily and expressed an interest in fishing. In this he was not alone, as the children were intrigued by the method of electro-fishing as well as the net sampling. The former technique uses electrodes in the river to stun fish and identify them as they float to the surface. The latter technique uses a net to catch fish and identify them before release. (During subsequent participatory diagramming exercises the children drew a scientist with a fishing net. Their drawings and written explanations demonstrated a range of habitats along the river, including bed rock, stones and marginal vegetation). An enthusiastic discussion about fishing sprang up, and the children communicated that not only was eel fishing generally good when the dam gates were open, but also shared with the Ichthyologist the location of an excellent fishing spot upstream of Site 1 (see Map 7-1). In response the Ichthyologist stated:

The community has a lot more direct contact with their own environment and their perceptions are based on what they see and use (Marriott, pers. comm. 1997).

The children and the Headmaster happily engaged with the Ichthyologists. One of the Ichthyologist noted it was his first time working in rural areas, and also with children however he said that he came to recognise that sciences should communicate results to communities, as seen in his written reflection below:

The environment is important to all of us. It is unacceptable to expect people from rural communities to 'know' what to do. Scientific knowledge is of little or no use unless it can help mankind. It is thus extremely important that scientific knowledge is supplied to the rural communities as they are usually the most dependent on the environment (Vien, pers. com., 1997)

In this exercise the children were exposed to river care as a recognised discipline and profession which contributed to the protection of biodiversity of a system for future generations. At the sampling site the scientists sought an understanding of the surrounding area that the children had been learning to do and thus felt they could contribute by finding a good site for electro fishing. I felt that was important for the children to get an insight and exposure to the science of river care so that they could see what they had been doing was important and not just 'playing around.' Also, without exposing the children to the world of river care they may have thought of their work as separate and not part of something broader. In this way a sense of partnership was developed - helping children see a role for both the outside scientists and local people in river care. For example: a child seeing a poster displaying a river scientist would not have been able to make the link and engage with the information. This exposure was limited and short-lived, but important in light of the IWRM program being implemented throughout South Africa.

In this exercise, improved teamwork was clearly demonstrated by the ease with which the children chose to communicate their experiences within the group; some spoke of what they had seen, others wrote, or drew. This exercise had a lasting impact on some of the children as they often drew the scientists' with their nets and electro fishing equipment on subsequent occasions.

7.3.8 Day Eight

The eighth day of PRA work with the children was spent in the classroom exploring the sites at which the children collected water and how they experienced the taste of this water. This exercise in water quality was then combined with a comparison between local knowledge and the scientific knowledge of a water quality specialist (Papaloizou, 1996a).

The mental maps drawn on Day 5 were again placed up on the classroom walls and the children were asked to add their water collection sites while they discussed the water quality at these sites. A fellow team member recorded the verbal descriptions of water quality on another chart.

The children then sketched in people collecting water on the maps as a symbol indicating the places that they identified as water collection sites. The drawings and the discussions revealed that the children used multi-sources: they used different sources to draw their water for different purposes. For example, ten children collected water from the 'Cart site' (Site 1) for drinking and washing, two children collected drinking water at the 'Heads' (Site 2) and one child indicated that their family used water from a site below the school' (Site 3) for drinking and washing (see Map 7-1). Two children used water from the furrow for washing. No one used water from the weir at the bottom of the furrow (Site 4). Five children obtained water from taps in Tamboekiesvlei, which was described as being clean. The quality of water in the Kat River was perceived as being superior to that of the furrow.

Re-using the mental maps drawn earlier prevented an unnecessary duplication of work, as Plate 7-10 demonstrates. In this Plate a child can be seen adding to the map with a green marker. Because they had created the mental maps, the visuals held relevance for the children and adding new features allowed them to understand, explain and answer questions. Thus the maps aided explanation and discussion, and also served to communicate dramatically the children’s understanding and appreciation of their environment.

A water quality exercise was undertaken jointly by the children and Papaloizou, the water expert. Specific water quality analysis exercises were carefully selected from the Umgeni water kit entitled ‘Green Catchment Action Starter Kit’ which has been designed as a starter pack for school-based water quality monitoring in Southern Africa (O’Donoghue, date unknown). The “Catchment Action Starter Pack is a tool to both find out what is going wrong and to work together to solve local water quality problems” (O’Donoghue, date unknown, p.1).



Plate 7-10 : The Water Collection Sites along the Kat River

The selection criteria of the exercises was based on colour, smell and harmful inputs in order to compare the children’s knowledge to a western, scientific understanding of how to identify water quality. Worksheets that had been translated into the vernacular (See Appendix 2 Box 2) were circulated amongst the participants. The exercise took place at the site called ‘Carts’ (Site 1) and the children were asked to observe, discuss and answer the questions on their worksheets on site. After the exercise the water kits were handed over to the teachers to enable further work.

Three aims and methods were used from the Starter Kit (O'Donoghue, date unknown):

Aim 1 Is the water safe to drink?
Method Collect a glass of river water and note the smell.
Result Odour also played a part in their evaluation process: water that smelled of fish was understood to be bad. The children explained that smell is mostly used in situations when the water quality looks bad to the eye or when a collector is obtaining water at a unfamiliar site. Smell is used as a means to cross check the water quality, and is not used on each water collection.

Aim 2 Is the water safe to drink?
Method A sighting disk inscribed with water clarity values was fastened to the bottom of a wide based plastic container. The Children filled the plastic container with river water to 20 cm. They were asked to look into the bottle and establish the water clarity value that is visible and write down the numbers they saw.
Result The number the children recorded from the sighting disk was 2,3, and 4. This finding, accorded to the Umgeni Starter Kit showed that water had a 60% visibility. The accompanying discussions revealed that the children evaluated their water by sight – a muddy colour and stagnant water would indicate, for example, that a site was not good for drinking water.

Aim 3 What is the Chemical balance (pH)?
Method The children dipped the pH stick into a river water sample for approximately 15 seconds or until the stick changed colour. Then the children compared the dip stick with the colour code and read-off a pH value from the chart.
Result The Children recorded 7.2 as the pH of the site which is classified as normal water. Ten Children stated that they collect their daily water supply from this site and spoke of the water as 'sweet' and "good for drinking". Even though the children described the water's colour as "muddy", they maintained that the water was still "sweet". However, two Children did describe the water as "very salty" and "tastes bitter".

The children became involved in the water quality testing quickly and easily. In addition, the children stated that the water was collected in areas where there was little floating or rooted vegetation cover, because "the place that leaves, flowers and trees fall into the water is a bad sign" (Xhosa pupil, aged 12, 1996). Finally, the children stated that livestock, the opening of the dam gates and run-off from the lands dirtied the water. The 'solutions' they identified included to purify the water by "throwing chemicals in the water" ('Coloured' pupil, aged 9, 1996) or "the dam people must make plan to purify the water" (Xhosa pupil, aged 14, 1996). At this point a sudden rainsquall interrupted the process, which resulted in the children's knowledge and the scientific results not being fully shared.

The incident of the sudden storm highlights an important realisation within participatory work. This is simply that one cannot assume that one has complete control over the process. In this case, the exercise was terminated abruptly and prematurely. This is, of course, not ideal. However, I believe that it is not helpful to attempt to force participants into continuing, particularly when they have made up their minds to return home.

The on-going process of sharing and learning about the environment helped to engender new themes, re-work familiar ones and illuminate a bigger picture of the relationship between people and the environment. For example, the children's knowledge and ability to evaluate their water impacted directly on where they sourced their water from, as well as what it was used for. This corresponded with my previous research findings (Motteux, 1995). The exercise demonstrated that rural children have a deep respect for, and knowledge of, water quality.

After the session with the children I interviewed the water quality scientist concerning the concept of integrating local and scientific knowledge in relationship to her experience with the children. She saw the need for science to be used as a tool to discern harmful pathogens for human consumption and use that cannot be found by using sight and sight. She said:

I found that the children are aware of the importance of water quality. Water quality is not a new concept to the children. For example, I found that they know where the water is sweet and brackish. I feel that although the children are aware of the need to use their senses to establish the water quality I believe that they cannot pick up the unseen bad elements in the water. The more visible things, like algae can be brushed away as seen by the women at the middle reach. Therefore, knowledge of the local people is as far as they can use their senses. Science can identify any harmful bacteria or chemical in the water that senses cannot (Papaloizou, 1996b).

Through our work together in designing the water program with the Water Quality Specialist and the school children, and her work doing water testing in the broader community she came to acknowledge the importance of working with the community rather than extracting information for the sake of research.

I learnt that it is not ethical just to go into a community and work without consulting the village people. I came to realise the importance of incorporating community people in future projects as to validate and crosscheck my findings. I feel that two-way learning is vital: I can learn from the community and they from me (Papaloizou, 1996b).

At the debriefing session the female trainees announced that they would not be able to participate in subsequent days. At this point the male trainer confided in me that one of the trainee's had been his partner two years ago and that he had starting dating somebody else. Through this explanation I started

to understand the reasons for the female trainees being subservient and distancing themselves from the process. Although I was scared to engage into this conflict and made a decision to continue the program, I started to realise that the old-school ideas of labour management that hold that a worker should not bring 'personal stuff' to work was short-sighted and counter-productive. How could participatory work avoid the troubles, strengths, frailties and abilities of human beings, all of which inform the work that trainees did, when the work calls for an emotional and mental input in questioning and reflecting on one's work and knowledge. Also, with regard to the trainees, the work took place within their lived contexts where their likelihood of meeting people who they dislike, like and respect are increased and thus conflict is inevitable

7.3.9 Day Nine

On the final day the school research program concluded with an evaluation of the research process. The schedules took the form of self-surveys translated into Xhosa. Self-surveys ensured that the children could complete the evaluations in confidence. Privacy was essential, as questions required the children to be honest about the course. Thus, no names were written on the surveys.

The children had all undergone certain experiences throughout the research process and the self-survey found that the children had enjoyed learning about the river, going on outings, learning to work together, drawing and watching the Ichthyologist. Their typical reflections demonstrate this (Hertzog School, grade 4 & 5, 1996):

"I wasn't scared of anything as I enjoyed it myself".

"I enjoyed being by the river".

"I remember the day went to the river".

"I enjoy the learning".

Areas of self-improvement and areas that they took up were the need to respect each other, acknowledge the importance of the river, the affect of man on the river and the importance to keep the rivers clean by not throwing fertiliser into the river and picking up litter. One child expressed the fear of drawing.

The evaluation showed that all the children had taken their new beliefs and knowledge to family members and their friends: not to kill fish, nature has a right to live, the river is important, each person is responsible for keeping the river clean, not to throw litter, not to chop trees. However, in the further use of PRA, the children's comprehension and new insights indicated that their opinions and attitudes to people-environment issues had changed and they felt that they could positively care for the environment (Motteux *et al.*, 1999).

7.4 Conclusions and Reflections

7.4.1 Reflection on the Influence of the Orientation

Chambers (1994c) speaks of the temptation to label 'traditional' work (extractive research) as RRA or PRA. Within my own research, I critically examined both where I was in the process and how I made use of the methods that I had chosen. At the outset, I was firmly located within an interpretive and anthropological framework. Yet I also felt a need to shift from a top-down to a bottom-up style of working, from centralised standardisation to local diversity, and from following a blueprint to engaging in learning processes (Chambers, 1992a; 1994c). Thus, inspired by this need, I began working with PRA principles. I set out to learn "about rural life and conditions from, with and by rural people" (Chambers, 1994c, p. 953). It is necessary to acknowledge here that, with reflection and hindsight, I can see that in the midst of this shift I was less than fully involved in true PRA work. Rather I was experiencing a transition from a dominant to a participatory orientation.

Within the research process itself, I felt a range of conflicting needs. These included: fulfilling academia's research criteria; providing answers for the funders; addressing pertinent issues raised by critical colleagues and friends; and ultimately, offering findings that could filter through to South African resources managers. In this, I experienced a profound tension, particularly in light of "the academic community, interested more in detail, precise observation and measurement and rigorous and respectable methodology" (Carruthers & Chambers, 1981, p. 407) as opposed to acknowledging my role as providing a stimulating environment for participants (Lather, 1986). Comstock (1982) writes of the task of the researcher to ensure that these stimulating environments encourage participants to enter into "a self-sustaining process of critical analysis and enlightened action"(p 387). Yet at this point I was still trying to record the process without influencing it and felt I had no choice. In other words, I was still engaged in a desperate attempt to be 'objective' and a 'detached observer'(Eisner,1992). This is an effort which is in direct conflict with principles of change and empowerment for all participants, including the practitioner (Lather, 1986).

7.4.2 Management Style with the Trainees

I found that the development of formal management structures in participatory water resource projects did not require me to adopt traditional, authoritarian and hierarchical management structures. Although I attempted to adopt a more informal management style that was focussed on collaborative learning, I often lapsed into adopting formal management structures. This was simply because of a lack of experience or knowledge of alternative structures and my need for the team to work efficiently and effectively so as to achieve the product (ie. information for my thesis). As a result, my training strategy did not lead to the participation of the trainees in IWRM and a commitment on their part to the process. Although I knew

that there was an urgent need to appraise and address this situation, I felt that I did not know how. I felt the discrepancy between participatory systems being so unstructured and flexible that I had no power and traditional systems that gave me power but did not encourage participant learning. I had learned that in a participatory orientation participants own the work and they become committed but this requires a lot of continuous capacity building and support from the team and myself (Motteux, 2001).

7.4.3 The Emergent Process

The main focus of this Phase was the accumulation of sufficient information concerning the children's relationship to their environment within their lived context. An additional outcome was to use, learn and explore participatory research methods to create a reciprocal research design where both the children and I, the researcher, could learn and seek solutions. The work started to evolve flexibly - acknowledging that I was "not knowing what is not known" (Lincoln & Guba, 1985, p. 235). Although the program of activities for the school children had been pre-arranged, other events and methods started to originate from the context itself and were initiated through interactions during the research process.

Some of the lessons I learnt in the research process with the children and the trainees were:

- Each of us responded to methods differently - for example collective drawing, individual drawing, writing and articulating. These responses affected different stimuli and built confidence. For example, the use of a range of PRA and research methods enabled the children to feel good at least somewhere in the process and often resulted in the children exploring themes from other angles.
- Shifting the learning environment enabled the children, trainees and me to explore different aspects. For example the transect walk to the furrow, as opposed to working within the confines of the school, enabled us to relax and observe the environment. Homework also encouraged the children to observe their home environment without interruptions from peers, trainees or from me, the researcher.
- Building confidence and trust and learning takes time and cannot be rushed. This applied to all those participating in the process.
- Constant reflections resulted in my need to be alert to the need to shift and adapt the program and methods to the research needs, for example, in response to group dynamics.
- Methods cannot become cast in concrete. The children, trainees and myself adapted these as the process evolved. For example, the children's groups assigned earlier in the program were not necessary towards the end of the program as confidence, understanding and commitment to the work increased.
- To appreciate that the skill of using PRA methods requires dedication and commitment to constant learning.

7.4.4 The Children's Environmental Knowledge

The shift from traditional methods with the adult groups (See Chapter Six) to using PRA methods with the children presented me with a valuable method to gather information. As stated in Dudley (1993), the more relaxed encounters as opposed to formal meetings gradually shifted my status from an outsider to a person or to a 'friend'. The closer relationship enabled me to gather more personal knowledge and information. For example, the trainee opening up about his personal relationship (See Day 8). I started, therefore, to see the power of participatory methods. This Chapter traces the evolution of my status as an outsider to that of becoming more involved in the study. This work also prompted me to feel the tension of being the detached researcher and that person who helped the children to understand and seek solutions to change their situation. Thus, the writing of this thesis text covers both qualitative results of the 'researcher' and the research process of growth and co-learning of the researched and the researcher as well as the substantive results regarding perceptions of riverine use and environment.

The Children's relationship to their environment can be summarised as:

- The environment is 'lived in'! It is not discovered through books but known through experience of play, resource collection, walking from place to place and through cultivation and livestock care. It is knowledge that is mostly gained through 'doing'.
- Environmental knowledge is a practical knowledge. Environmental knowledge is known to achieve an outcome, for example: observing where is the best place to draw water, smelling which is the fresh water and carrying water.
- Environmental knowledge often directly affects their well-being, especially in poorer households that cannot afford to purchase supplies. For example, a decision of whether or not to collect fuel wood relates to choices about being warm or being able to cook food.
- Household activities for most of the children take place outside the main house, for example washing clothes and dishes, cooking bread and playing. Thereby, the children's households' environment is not confined to indoors, thus blurring the boundaries between the house and the environment.
- Children's relationship with and experience of, the environment varied. For example, some use tap water or water tanks, some walked to the river, some used donkeys and some go in a pick-up truck. Therefore, even though water was understood as scarce resource, each child had his or her own unique experience.
- The children did not see the environment as separate. The drawings and writing illustrated the environment as connected to their lives. For example the drawing of the hydrological cycle included people, gardens, fields, animals, toilets, houses, birds, suns, mountains.

- The childrens' observation of the environment was acute and detailed. For example they drew the Kat River from memory, placing houses, fields, water collection points, trees, livestock with precision.
- Resources are communal and often the quality of the resource is compromised by livestock and farming. This feature was highlighted by the children's drawings of the river that showed a resource as 'good' and then 'bad'. For example, a cow was good for cultural and food reasons and 'bad' for polluting the drinking water of the river.

7.4.5 The Teacher's Relationship to IWRM

Parents do not teach their children about environmental care as seen by the below quotes from the Hertzog Primary School teachers in a brief survey at the end of the work with the children (See Appendix 2 Box 3 for the survey questionnaire).

I thinks that fathers and mother nowadays don't teach their children how to do things in the correct way, that makes me very angry. People keep their heads down and keep themselves away when they see me. See my yard it is clean. I show my children and grandchildren to show care for the environment. I sometimes tell others, but they don't listen. But I carry on looking for the environment (Grandfather of 'Coloured' Pupil of Hertzog School, aged 12, 1996).

I feel that in the rural areas, education of children is regarded as the teachers' responsibility. The families have many pressing economic concerns: food to eat and clothes to wear. The families view environmental concerns as a trivial issue (Headmaster at Hertzog School, 1996).

Very few children are taught about general environmental concerns at home (Teacher at Hertzog School, 1996).

Most teachers do not live in the rural areas and therefore do not face the same daily realities of relying on the environment for basic resources (food, collecting water and firewood). They do not experience the consequences of environmental degradation. In some situations the teachers see "rural people as less important than their urban counterparts" (Burt, 2000, p. 36) whereas other teachers feel victimised and feel unsafe living in rural areas (Burt, 2000). Therefore, from the above the sustainability of IWRM necessarily requires the children's teachers, adults (parents) as well as children to become more involved. IWRM programs need to be both educational and supportive for the groups to learn to work together and share their different realities so as to ensure that action projects meet the needs of the people and the lived in context. I realised that for IWRM to be sustainable the participation of schools, teachers and village leaders was essential.

8 Phase Two – PRA with Adults

8.1 Introduction

Phase Two marked the gradual shift in the approach to achieving the aims of the thesis. Initially the approach was concerned with accessing local knowledge on behalf of and to the benefit of outsiders and doing so within a scientific study that would blend local knowledge with scientific approaches. The original approach of the research, namely collecting local knowledge on environmental practices, could not provide a foundation for implementing IWRM because the participants lacked confidence and knowledge in such matters (Described in Chapter Six). Thus, the approach to achieving the aim began to shift towards establishing and providing a forum in which village people could learn to articulate and construct knowledge, and review their situation. In order to create a context in which participants were able to enhance their capacity for reviewing and gain deeper understanding of their conditions, the processes of generating knowledge and building awareness were engaged in via lived experiences (Heron, 1981). This phase also drew on my experience with the children (detailed in Chapter Seven) with whom I had started to appreciate and explore people-centred approaches that sought to enable empowerment. These shifts started to address some of the contradictions that had frustrated my initial work with the adults in administering the household survey.

This chapter begins by describing the transitional phase between limited integration of community people and myself (See Chapter Six) and being able to identify overlapping needs in Phase Two (see Chapter Four for a discussion of overlapping needs). An environmental workshop was identified as a suitable process to implement this transition and is outlined in this chapter.

The group orientation and the focus on local involvement allowed the research to develop into a meaningful process for the villagers. This chapter details the change in focus in which my efforts as a researcher became concerned with providing a “change-enhancing context” (Lather, 1986, p. 269). A key concern in this chapter is how the participants, the team and I entered into a process of mutual learning. At this point the intent of the research was to understand how to provide a forum for self- and group understanding within the given social and historical context. It was envisaged that such a forum would enable people to examine alternatives and develop a joint action plan for river conservation.

This chapter provides a detailed account of the preparation for and implementation of, the Environmental Awareness Workshop held with Hertzog and Fairbairn residents (See Map 1-2). It is hoped that by presenting one workshop the reader will gain an appreciation of the process of engaging community members to enable them to actively participate in integrated water resource management (IWRM). This

workshop was destined to be the first of many. In each of the following workshops, the communities' existing environmental knowledge was constantly acknowledged and affirmed, with the use of drama and participatory rural appraisal (PRA). The goal was to create a lively, stimulating, consciousness-raising workshop.

The chapter focuses on how community participants and I – acting on mutually agreed objectives – explored and challenged river conservation methods at the community level. The workshop process was planned jointly by the community participants and me, in order to provide a basis for: exploring resource use, practices and values within the local community; reviewing traditional and current systems of resource management and decision-making; identifying costs and benefits of conservation (e.g., local health, nutrition and resource replenishment); and seeking to understand environmental problems in order to construct an action plan.

The approach became focussed on finding methods that would facilitate marginalised people becoming part of river conservation. Addressing the above issues, the methodological objectives were to:

- engage the local people in the research through developing a working relationship based on articulated overlapping needs;
- reflect continuously on my journey and apply the principles of participatory theory;
- negotiate, prepare and provide a framework that enabled participants to change by encouraging self-reflection and deeper understanding of their socio-historical and environmental contexts;
- use empowering approaches for the generation of knowledge; and
- ensure that such approaches recognised the importance of reflecting on the process rather than being directed solely by the need to extract data.

The presentation of this chapter is similar to that of Chapter Seven in which the methods and results are discussed alongside each other. While this is not a traditional method of presentation it does serve to highlight changes within the research process (Lotz, 1996). The aims, objectives, results and conclusions continuously unfolded and interacted, and this is consistent with a participatory orientation that acknowledges the value of ongoing processes (Janse Van Rensburg, 1995; Lotz, 1996). Participatory research is fluid and does not have 'end points'. In this, it can be said to be still continuing in the actions and thoughts of participants, team members, funders and supervisors (Lotz, 1996). Were I to claim an end point, this would deny participants ownership in the project in that I would be seeking to control the direction and action.

8.2 Reflecting On and Questioning the Research Journey

As discussed in Chapter Four, the first step in rectifying my mistakes and misconceptions in the administration of the survey in 1996 was to reflect on the stage in the research that I had already done before returning to the village to conduct further research. With this in mind, I accessed relevant literature, talked with fellow researchers, and enrolled on an Environmental Education methods course held at Rhodes University. The latter was intended to help me find a better way of reaching and including the local people in the research process. I turned towards participatory concepts that were more flexible and more people-centred (as detailed in Chapter Four). I resolved that I would not be driven by a need to control and run the project without the local people participating in decisions or activities.

8.2.1 Negotiating Overlapping Needs in Preparation for the Environmental Awareness Workshop

Once I had recognised and appreciated the importance of including local people, I sought to encourage participants to become involved with their information by transferring the water quality research and the survey information back to the people. The aim was to determine where the needs of the participants overlapped with the needs of IWRM as defined by the NWA. I did so by arranging workshops for the 15 May 1997 in both Hertzog and Fairbairn so that there could be a report back to the community. The first workshop was held at Hertzog in the morning and the second at Fairbairn in the afternoon. In order to encourage attendance I sent out invitations by, firstly, asking the children to take them home and, secondly, by delivering them door to door. These workshops were used as a forum to brief the participants on findings of the water quality assessment (Papaloizou, 1996a) that focussed on the reach of the Kat River from Hertzog to Fairbairn, and the socio-economic survey (See Chapter Six). At the workshop participants were encouraged to select issues important to them so that we could combine our knowledge usefully.

During the workshops held on the 15 May 1997 that made use of both local and scientific knowledge both villages showed more interest in the scientific findings of their river water quality, than in the content of the social survey. The issues of concern that were identified at the workshop included: the condition and quality of the river water for drinking; the impact of the water quality on health; and suggested measures to prevent illnesses arising from using river water.

At the Hertzog meeting, participants prepared a 'mental map' showing a drawing of the Kat River (See Plate 8-1). This exercise was repeated at Fairbairn. The participants contributed to the drawing of the map by describing and indicating where I should sketch in the different land uses around the Kat River. The use of the land and physical structures were sketched and labelled accordingly. Different colours and

symbols were used, such as green circles for good water, red triangles for poor quality water, yellow triangles for warnings that action was necessary and yellow rectangles for problem areas. The purpose of drawing the map was to enable local people to identify and name the sites at which they collected drinking water. These sites matched those that had been selected by Papaloizou (1996a). In this way the resulting mental map (See Plate 8-1¹⁶) brought together scientific and local perceptions of Kat River water quality. After detailed discussions concerning the water quality from both the local and scientific perspectives, a colour-coded key was used to indicate water quality results on the map. This resulted in a clear representation of the general quality of drinking water as well as the rapid deterioration of water quality between upstream collection sites near Hertzog and those in Fairbairn.



Plate 8-1 : The Mental Map of the Kat River

The social and scientific survey results showed that the villagers were dependent on their environment for basic necessities such as food, fuel, water and medicinal products. In addition, their environmental problems were connected with the area's social, historical and political background. This was manifested in the neglect of their riverine environment. The scientists had observed evidence of erosion, deteriorating water resources and pollution caused by humans and livestock (Papaloizou, 1996a). The socio-environmental survey showed that poor environmental conditions were linked to lack of confidence, limited financial resources, poor education and limited communications. All of these were explained to the villagers as being features that had contributed to their inability to care and manage their environment correctly.

16 The Key for Plate 8.1 Red Triangles (Bad); Yellow Triangles (Decreasing quality, need to take precautionary action); Green Circles (Good).

A spirit of information sharing was encouraged in the workshops and this enabled participants to proffer the measures taken by the community to prevent water related illnesses. During the meetings, thorough discussion of the results ensured that the participants' questions were fully answered and that they had a clear understanding of both the results and their implications. This understanding is demonstrated by a participant's comments on water quality with reference to the map, shown in Plate 8-1:

The middle part of the Kat River, which is still at Hertzog, is not good at all. It has a red label, which means you must cook this water or have chemicals before you drink it. The yellow label here is not bad water.

Lower part that is the water the Fairbairn people use for cooking and drinking. People must cook the water here before drinking. There is also a stream that runs down to the bridge and during heavy rainfalls that sand blocks the bridge. When there is no rain or water from the dam the water is stagnant and not good to be used unless it be cooked. It also has a red and a yellow label.

The area next to Mrs Bless house is totally wrong. It is not good to be used by people. It has double red labels. Farming affects this water place because of the fertilizers that farmers are using.

The presentation of the survey and water quality findings and discussion around the social and physical aspects of the environment empowered participants with an increased awareness of their own capacity and knowledge. This inspired a desire for action, to implement solutions and solve their own environmental problems. In further group discussions within these meetings, participants acknowledged that 'Government' support was unlikely and that they should therefore look to another 'body' that could help them action their newly acquired understanding of their environmental problems. In this way, I was asked to help. The leader who was pivotal in the establishment of the locally driven agricultural co-operative (HACOP) said at the report back workshop of the 15 May 1997:

Please, what can we do about our environment. We are willing to learn. We need our environment for health and future. If we do not do something on our own we will sit for years to come. We see that we face environmental problems and we as a people depend on that river for drinking. We must sit as a community and talk about this. You see here the people and livestock drink from the same place. No taps and no government. It is good to work together.

In this way, the needs that were identified in the meeting laid the groundwork for a future joint agreement that committed the communities of Hertzog and Fairbairn to investigate their environmental issues in workshop settings and with my assistance. This established 'the change' that I had been searching for in Phase One: I had become a facilitator rather than simply an observer.

Questions posed within discussion around the feedback encouraged participants to speak freely and resulted in the local stakeholders being able to address the need to work together in order to consider river conservation strategies. The overlapping needs that arose from this affiliation allowed for the formation of an action plan, established jointly between the community and myself. The action plan led to the hosting of two Environmental Awareness Workshops. The community selected HACOP's project house as a venue for the workshop and agreed that twenty people should attend each workshop with equal numbers of people attending from Hertzog and Fairbairn. Twenty was considered to be the optimum number of participants for each session, given the limited space available and the need to involve all participants fully. It was also considered important that a good balance of gender, age and status was achieved amongst the workshop participants.

The village people and I agreed to share responsibility. Thus the villagers agreed to select two community members to review the program and its objectives, arrange the venue, select participants for the workshop and prepare the food. It was decided at the meeting that I would provide transport for participants who lived far from the workshop venue. My responsibilities included providing a structure for the workshops including a detailed plan outlining the aims, objectives and methods, seeking advice, employing a local facilitator, gaining background information, acquiring and making materials, translating the work sheets and budgeting. I also explained that the workshop would most likely use participatory methods that drew on Theatre for Development (Boal, 1992; 1995). I detailed the reasons for using such methods (such as enabling sharing, interaction and participation) and asked the participants whether they would feel comfortable working in an interactive environment. At one point the people were tired and said that it would be best if the grassroots interpreter reviewed the program. Reflecting on the meeting afterwards it was clear that time constraints resulted in the community people entrusting the task of outlining the objectives and methods to me. However, the participants also acknowledged that the proposed environmental workshops were for our mutual benefit, hence their suggestion that the grassroots interpreter from Hertzog review the program.

On reflection I found that the most critical concern in these meetings was encouraging the attendees to become active participants. This was shaped by the necessity of what information was required and by how best to present it so that it was accessible by all. For example, it was vital that the participants understood the survey and water quality findings as no participation or negotiation would have been possible if the participants had felt intimidated by or isolated from the information. Therefore, sensitive and non-threatening methods such as focus groups were used to encourage the marginalised village people to become involved in developing specific agreements between themselves and me, and in decision-making. From this, my intuition led me to feel that further tasks may have not been beneficial and could have led to people feeling overwhelmed. Discussion around the findings revealed that the people

sorely felt the impact of their adverse living conditions: poor drinking water, no plans to obtain tapped water, and feelings of being abandoned and forgotten by government. Of critical importance to the research was the local peoples' feeling that the only option they had was to try and understand the causes of poor river management with no promise that the workshops would result in any development or real change. This was particularly relevant since at the time a student bursary was financing the project.

8.2.2 The Preparatory Phase of the Environmental Awareness Workshop

Guided by Pretty *et al.*'s (1995) assertion that sound preparation in the preparatory phase is a vital component of running a rural workshop, I prepared and used a thorough plan. While this plan was constructed and used in the preparation stage, it had a far-reaching impact on the outcome of the workshop. The planning methods used covered initiation, logistics, development of a formal program, hiring grassroots workers and reporting for the workshop (see section 5.3.1).

In the week following the initial community meetings, I studied the recommendations put forward by the villagers and used these to prepare the program for the proposed workshop (See Appendix 3 Box 1 for the detailed program). This required consolidating the recommendations in order to compile a thorough plan that emphasised joint aims and objectives that met our overlapping needs. I also clearly defined a set of objectives that I asked my supervisors, team members and a village member to review. The opinions on what the program needed to achieve included:

- reporting on the preliminary results of the initial scientific study of the riverine resources and socio-economic survey;
- exploring local knowledge, attitudes and daily needs affecting the riparian zone;
- determining the needs of IWRM for environmental management as defined by the NWA;
- understanding the cause and effect relationships that occur in the environment and exploring possible solutions;
- understanding the cause and effect relationships created by humans and exploring possible solutions;
- enabling the community to critically review, evaluate their actions and impact on the environment and collectively find solutions to specific problems;
- reviewing the methods employed in the community-based enquiry; and
- reviewing my engagement within participatory philosophy.

Once the objectives had been established, an overall detailed plan was formulated in order to achieve a workable structure that would be responsive and adaptable. The program was written as a comprehensive document that not only listed aims, objectives and methods, but also listed inputs such as workshop materials, tasks for the team, some examples to ensure that the objectives were clear and

understood by all, possible prompting questions and seating arrangements. Some of the key inputs are listed below and described in Chapter Five:

- Time periods for training facilitators, setting up the workshop and transporting village people to the venue.
- Time keeping for each activity or task performed in the workshop, arranging breaks, discussions and improvisation or playbacks for better understanding.
- Skills required, such as acting, language translation, co-facilitation, taking photographic and video recordings.
- Required workshop materials such as drama props, stationery, photographic materials and musical instruments.
- Budgeting for salaries, transport, accommodation, catering and the purchasing of props and workshop materials.

The detailed plan enabled me to gauge the amount of food and stationary that would be required; to set the starting times of the workshop; and to give participants the times for picking up those who required transport to the workshop.

The community and I agreed during the report back workshop of May 15 1997 that there was a need to employ and involve a small team that could help run the workshop. Accordingly, two people who were willing and able to contribute to the work were selected. Both came from previously disadvantaged backgrounds in the Grahamstown Township. The number of assistants selected was influenced by budget constraints. The selection process was based on the principle of giving previously disadvantaged people equal opportunities for employment and in the hope that further rural projects would not see a need to depend on expensive consultants. With these two people, the team available to implement the environmental awareness workshop comprised of one researcher (myself), one grassroots interpreter from Hertzog (Vuyani Rangana) and two grassroots facilitators from Grahamstown township (Molly-Anne Nqweniso and Tombile Tom). In addition, a student photographer, Angie Lazaro was employed.

In keeping with my intent to provide an enabling environment for local people, was the need to prioritise team development, particularly since these staff were key to ensuring the success of the project. The team needed to learn to become adaptable, self-motivated, self-reliant and capable of creative thinking. Furthermore, workshop skills and participatory methods (including drama) needed to be developed. The two facilitators had no experience in working in rural development contexts, river conservation or

participatory methods such as performance theatre and participatory theatre (as described in Chapter Five). However, Molly-Anne Nqweniso one of the selected facilitators enjoyed drama and had studied geography at school to matriculation level.

The first task was to enable the grassroots interpreter and the facilitators to learn about the riverine environment and become familiar with the workshop concept. This was tackled through the use of a series of meetings in which I provided background information on the physical and human aspects of river conservation. I prepared a set of notes that the facilitators and the grassroots interpreter could read and fill in answers on the following topics: what is a river; human use of the river; ecosystem demands of the river; cause-effect relationships; upstream and downstream relationships; some solutions to perceived environmental concerns; participatory approaches and thinking.

Throughout the learning process, emphasis was placed on the task ahead. This gave the facilitators and the grassroots interpreter an understanding of the program as well as the confidence to suggest their ideas. This training was vital as the program was not presented as fixed and therefore it was important that the facilitators and the grassroots interpreter were able and willing to add their own ideas. This necessarily required that the facilitators and the grassroots interpreter had an adequate understanding of river conservation, participatory methods, the aims and objectives of the project, and the local context in which the workshop would take place (for example, socio-historical and political relationships between the villagers as well as my relationship with the communities). Empowered with this information, the facilitators and the grassroots interpreter were confident enough to adapt the program so that it met the needs of the local people and the project.

In the joint development of the program, two complementary facilitator roles were identified in order to avoid duplication and potential conflict. Given the small number of people in the team, there were times during at which the facilitators, the grassroots interpreter and photographer were required to take on other roles. This assisted in encouraging a flexible approach, which provided valuable support for me, necessary input for participants attending the workshop, and helped to establish a good working relationship between team members. The team as a whole agreed that the role of the grassroots interpreter was to record and to translate information, with the help of the two facilitators.

This training period allowed an opportunity for a team member and talented actress, Molly-Anne Nqweniso, and me to establish a method of working that met both our needs. We worked together when initially developing a drama. I would provide a broad sketch of the drama (written as a story), for which she would then develop as a script. From this point, Molly-Anne preferred to work alone and develop

her roles and dialogues in private. Once she had completed her task, she would present the drama to me so that I was able to discuss it with her and make comments and additions. Thereafter, the drama would be presented to the community.

In addition to the facilitators, interpreter and drama team, I also hired a skilled student photographer who was required to record the process photographically and with a video camera. I felt this was necessary, as I believed that for this work to be truly participatory, the team's focus and attention needed to be entirely on the participants. I further hoped that the video and photographic recordings would help me to examine my behaviour after the workshop as well as provide data for the thesis. In this way my data collection would not take the attention away from the participants. With regard to my use of the skills of the photographer, facilitators, drama team etc, Pretty *et al.* (1995) emphasise the practical benefits of task-sharing: "During a session you are juggling many tasks at the same time: providing theory, assessing group mood, dealing with audio visuals, and providing guidance to group work. Sharing the sessions gives you the opportunity to catch your breath and be more effective in your next session" (p. 31).

As stated in Chapter One, Phase One and Phase Two were run on a small budget. Consequently, I was not in a position to pay the photographer professional rates. Since I was paying a reduced rate for her services, I felt that it was important to ensure that she received something that she considered valuable in return. In her case, this was experience, as she describes below (Lazaro, pers. comm. 2001):

I wanted to photograph the rural people of South Africa and the project provided the perfect opportunity for two main reasons, firstly, a safe rural environment and secondly, the 'story' around which to document. (In South Africa it is not safe for a woman on her own to go into rural communities and working as part of the team; recording the project both photographically and on video was the perfect way to be in that environment. I was not just shooting 'interesting' photographs but I was recording and documenting the experience of the people involved in this most effective and exciting project.) I produced two in-depth documentaries of black and white photographs that were widely exhibited.

Although the workshop concept was new to most of the team and my only previous experience had been with a children's workshop, the time allowed for the preparation enabled us to feel confident. This was reflected in the actual workshop itself in which the team and myself were to facilitate, listen and share fully with the participants.

8.2.3 Reflection on the Preparatory Phase

On reflection, aiming for a sound foundation in the planning stages of the program provided a positive outcome in the organisation, co-ordination, realisation and application of the workshop's aims and

objectives. It ensured that the community was able to play a significant part in deciding their own environmental issues. I later shared my experiences with other practitioners working in rural development and emphasised the importance of a well-prepared program along with the critical issues of flexibility and an open approach to implementation (Motteux, 1997b; Motteux & Rowntree, 1997; Motteux, *et al.*, 1997; Motteux *et al.*, 1999).

On the issues of employment and remuneration, the researcher and employees both had a great deal to contribute. These contributions were realised through a process of identifying overlapping needs and finding a common ground on which a partnership could be created and continuously reflected upon. I acknowledged that it was my responsibility, as the key researcher, to provide a platform upon which common needs could be shared and taken up for the mutual enhancement of the negotiated goal. In this, Ford (1996) comments that the “underlying concept of mutual support to satisfy needs lies at the core of developing partnerships among insiders as well as between inside and outside elements” (p. 134).

I found that when paying a reduced rate for services, it was important that the relationship should not be exploitative and that the providers of the service should also gain something valuable, be it work experience, the opportunity to take photographs or to learn from rural people. If such an arrangement is not specifically negotiated, the working relationship is unlikely to prove sustainable and the worker may become unmotivated and resentful. As the photographer’s excerpt demonstrated, this kind of working relationship can be very fruitful for both parties. It does, however, require time and effort and the researcher needs to set time aside to discuss these issues with the staff and negotiate the necessary arrangements and conditions.

8.3 The Adult Environmental Awareness Workshop - May 1997

In this section, I offer a detailed description of the first workshop conducted with 17 participants at the Hertzog Project House on 22 and 23 May 1997. In this, visual, verbal and dramatic methods were combined with participatory methods, group discussions and crosschecking in order to ensure that the villagers were enabled to ‘hold and be in possession of’ their opinions. This was a step-by-step process that established the participants’ ability to make decisions together before taking action. The steps that were taken included: setting up the venue; opening the workshop; using an ‘icebreaker’; providing an introductory talk; investigating participants’ concept of the difference between conservation and environmental destruction; exploring the concept of the river environment and their knowledge of the riverine environment; exploring the concept of upstream and downstream; resolving river management disputes and seeking solutions; and evaluating the workshop.

8.3.1 Setting up the Venue

The team and I arrived two hours before the workshop to set up the venue. Before unloading props and food for the workshop we discussed in detail how to use the two small rooms available and the outside area. Factors that we took into account were the light that filtered into the rooms, the cold weather conditions, the ability for the photographer to work without interfering with the workshop; and the number of participants. It was decided that the better-lit room would be dedicated to workshop activities however, activities that required more room would be held outside. All props were arranged in order according to the program in an adjacent room. Chairs were fetched from the local school. The photographer and I set out to collect the workshop participants from their homes with the help of the grassroots interpreter whilst the remaining team members continued to organise the workshop venue and to arrange the meal times with the local Hertzog caterers.

8.3.2 Opening the Workshop

The workshop opened by a local participant leading the community in prayer and hymns. It is commonplace in the former Ciskei to begin meetings with a prayer, asking for God's blessings on the event. In this instance it offered an opportunity for all participants to sing together and to share aloud their hopes and concerns for the two-day workshop. It was a good way for the participants to take the lead from the beginning and for the team members and myself to feel welcome in the opening ceremony. It also had important symbolism; the community participants had the first input to the workshop.

I found the opening prayers and hymns a moving experience that established an expectant and joyful atmosphere that brought us together. The team members joined in with the participants in the singing of the hymns, which helped to ease their uncertainty in their first experience of facilitating a workshop. This was described by the actress (Nqweniso, 1997):

I was at ease and comfortable with these village people as I am part of the church choir. I felt I shared something with these people. I like singing church songs and so do they.

8.3.3 The Use of an 'Icebreaker' to Break Down Barriers

After the opening, I suggested an impromptu activity to break down barriers, address apathy and encourage participation. I had noticed that participants were beginning to sit back and expect that I should take over and run a traditional meeting that would put themselves in the role of 'listeners' and myself as the 'adviser'. Thus, I asked the participants whether they would like to warm up (because of the cold weather) with an 'icebreaker' activity.

The theme of the icebreaker was directly linked to the Kat River in that everyone, including myself, was asked to imitate the movement of the river as shown in Plate 8-2. This exercise began to break through

some of the barriers such as shyness, inactivity, boredom and being cold. The participants started to laugh and enjoy themselves. We began to know each other and experience the essence of the workshop in partnership.



Plate 8-2 : Workshop Participants Imitating the Movement of the River

The team members and I welcomed the icebreaker as it helped us to become familiar with the room and the participants, to become aware of the group dynamics and to relax. I also found that the icebreaker helped to shift my focus from the preceding issues of setting up the workshop and transporting participants, to the day's activities ahead. It allowed me the time to channel my thoughts from organising and rushing around to being within the workshop situation. The distractive potential of these logistics is explained by the photographer in her pre-workshop experience (Lazaro, 1997):

Vuyani, a research assistant, greeted us at the project house. Nicole, Vuyani and myself set off to collect the workshop participants from Fairbairn and Tamboekiesvlei. Tomblie and Molly-Anne, the two workshop assistants, began setting up and decorated the bare workshop room with props and posters. We ventured around the countryside on muddy slippery roads. This was a countryside I had not encountered before. Nicole accustomed to driving in such uneven terrain, gave me tips which would later serve to keep me from getting stuck as the conditions worsened. Finally, everyone was present and we were ready to begin the workshop.

A great deal of activity takes place before a workshop. When collecting participants one may have to wait as plans are finalised as to who will look after the children, cook the family meal, notify others that they will not be able to help in the fields, to dress etc. Given all this, an icebreaker exercise can provide

an important opportunity for everybody to come together and have the chance to focus on what is ahead in a fun and non-threatening manner. Since this transitional period sets the tone of the workshop it is important that it is carefully considered and that it isn't rushed.

8.3.4 Introductory Talk

After the warm up exercises, I gave a ten minute talk which was aimed at providing insight into the purpose of the workshop, based on the findings reached at the meeting held on 15 May 1997 at Hertzog and Fairbairn villages. My talk covered the reasons for the Environmental Awareness Workshop and introduced the program. This program or timetable was pinned on the wall for everyone to see and was open for comment and suggestions.

I pointed out that although respondents to the socio-economic survey had expressed that they did not feel capable of taking charge of environmental concerns this perception was already shifting. In bringing about the workshop and negotiating a working relationship with the team and myself, the community had acted and had taken charge of their perceived environmental crisis. From this, I encouraged participants to acknowledge their capabilities and challenge their own negative preconceptions about themselves in order to bring about change. An example of a limiting and negative self-assessment was the community's belief that they were not capable of informing their children about environmental management concepts.

The talk also emphasised the importance of the relationship of the team members to the participants, with an emphasis on listening, sharing, learning, being open to suggestions and not taking on the traditional role of teaching. This not only presented to the participants a new way of interacting, but also helped to remind the team how important it was that they fulfil their participatory requirements during the workshop. Since the participants were accustomed to a more authoritarian style of interaction, the aim and intent of participatory methods (as well their focus on active audience participation) were clearly explained. I also made it clear that involvement was not mandatory and that participants should feel comfortable throughout the proceedings. Furthermore, in areas in which people may feel insecure – such as writing, drawing, expressing an opinion – help would be provided.

I hoped that my introductory talk would convey openness about the concept of participatory methods and set a foundation for future proceedings characterised by clarity, transparency and respect. One member of the team described her observations as follows (Nqweniso, 2001):

The reaction of the people: During Nicky's words of welcome they showed concentration as she presented the survey results so as to establish what they were attempting to do. The talk also

explained how the workshop will work and that methods like drama, transect walks and drawings will be used but that it not compulsory. The participants don't have to do anything they are not sure about.

8.3.5 Bringing the Participants and Team Members Together

In order to ensure that the participants and the members of the team were able to interact actively and engage with each other, I made use of a 'seed mixer' game developed by Pretty *et al.* (1995). The objective of the game was to provide a space in which people could meet and have the chance to express why they were at the workshop and their feelings around it.

As is demonstrated in Plate 8-3, everyone exchanged cards that had been given to them to facilitate a process designed to and introduced themselves. Participants were encouraged to express their thoughts and ask each other questions (around their lives or connected with the workshop). I felt this exercise was a good opportunity for all to give each other moral and emotional support and that it encouraged a climate in which participants were able to express their views and listen to each other. It was interesting to note that even though participants came from the same or neighbouring village, they did not necessarily know each other well and seemed to enjoy the opportunity to connect.



Plate 8-3 : The 'Seed Mixer' Game

The team members also enjoyed the ‘seed mixer game’ since it offered an opportunity to engage directly with the participants and assisted in the necessary process of moving away from a ‘teacher syndrome’ towards operating as facilitators. The game enabled the team members to shift from a “we are dominant”(Chambers, 1992a, p. 19) mind set to an understanding of ‘we are facilitators, listeners and learners’, whose role and purpose is to encourage a “rapport. The game also enabled the team to “convene and catalyse, to enquire, to help in the use of methods, and to encourage people to choose and improvise methods for themselves”(Chambers, 1992a, p. 19). Ultimately, the game gave everyone a chance to feel included and take part in the workshop. It enabled people to speak freely and made a clear break with the traditional meeting style of keeping participants and presenters separate.

8.3.6 Investigating Participants’ Concept of the Difference between Conservation and Environmental Destruction

The workshop then moved into an exploration of participants’ understanding of the meaning of conservation in relation to their lives and a consideration of the effects of neglect in the local environment. This was achieved by arranging the participants in a circle and using a stick to indicate the holder’s right to speak. Once the participant had said their piece, the stick was passed onto the next person and so on. This was intended to ensure that no one person had dominance over the talking circle and to encourage participants to contribute thoughts and ideas equally. Thus the more reserved participants were able to have a say without having to fight to do so or choose not to contribute if they so wished, and the more talkative contributors were encouraged to listen. This exercise was further facilitated by the use of music to dramatise basic concepts of riverine management: for example, a soothing drum beat was used to indicate the concept of ‘conservation’, while an aggressive drum beat characterised ‘destruction’.

Thirteen out of the seventeen participants perceived conservation as actions that result in sound environmental management (See Appendix 3 Box 2 for participants perceptions of conservation). This was considered vital as they acknowledged their dependency and reliance on natural resources, as evidenced by an elderly participant’s remark that the “environment is our life”. The participants thus understood that a reliance on natural resources requires environmental responsibility, particularly with regard to the usage of resources. In this, participants articulated the need to support sustainable use of the natural resources in the future, as is reflected in the following statement by a middle-aged male participant:

Look after the environment. It is everything that we have. We both depend on each other. The environment depends on us. We depend on the environment. If there is no environment there will be no life at all. We as humans are also environment. We depend on each other. Everything that is on earth is God’s creature, cow, mountains, rivers, goats and all things.

The participants' examination and analysis of conservation found that 'it starts with us'. The participants described this process as being developed through building up self-respect, raising environmental management awareness through the elders educating their children, utilising the environment with respect and ensuring continued habitat diversity for the current and future use of the environment. This is encapsulated in the following statement made by a middle-aged male participant:

By respecting conservation we will be respecting ourselves and concerning nature. We are speaking of living things, animals and me.

Almost a quarter of participants believed that conservation is a duty to God (See Appendix 3 Box 2 for participants' perception that conservation is a duty to God) in that human beings have a responsibility to care for and look after God's creation. This is illustrated in the following statement from a young male participant:

We can all say one thing, that in conservation everything is created by God. Birds, goats and cattle, horses, donkeys and chickens are all the images of God and also we as humans should care.

The participants also acknowledged that a lack of environmental management leads to both natural and human crises (See Appendix 3 Box 2 for participants' perceptions of environmental mismanagement). For example, they perceived that the environment suffers from a loss of diversity, reduced river flows, the breakdown of food chains resulting in the extinction of some species and the overpopulation of others, as well as land degradation including erosion and high sediment discharges. In such circumstances communities are prone to illness and low life expectancy due to poor water quality, deforestation, drought, high mortality of livestock and other animals, such as snakes, frogs and wild life. Those valued commodities seen to be at risk were quality of life, employment and environmental beauty. Participants acknowledged that such a cause and effect cycle of environmental damage was destructive:

Environment is a very pure thing because it is a home of some animals. If you cut one tree you are destroying a house of one bird, as there might be a nest of that bird in the tree. When you cut those trees, you could be killing a bird. It is similar to a murderer and you must also know that there are other animals that eat that tree. It is the food of other animals. The river is the home of other animals. If the water in the river dries the animals such as fish and frogs will die.

Reflecting on their statements, participants recognised their close dependency and reliance on a healthy environment. This awareness gave participants a sense of purpose in attending the workshop and also enabled the realisation that they needed to meet together in order to discuss the way forward using their

local knowledge in environmental care. The participants raised a number of concerns involving environmental management and explored the issues with interest and care. This offered me the assurance that the workshop was appropriately focussed on concerns close to the sensitivities of the village people.

At the start of the first exercise I was apprehensive as to how participants would respond and whether they would feel confident and able to articulate their viewpoints. In addition, I was unsure as to whether the team members would be able to relinquish successfully their traditional roles of instructors in order to be facilitators and recorders of information. I was delighted to discover that my fears were unfounded: the participants were enthusiastic and responsive, and the team members demonstrated that they were able to put participatory principles into practice.

I felt privileged to be part of a group of people who showed remarkable insight in coming to terms with their environmental issues. I found the discussion to be rich and informative and became a co-learner as well as a facilitator. I was witness to the power of participatory methods in enabling participants to claim a voice and reveal a diversity of opinions articulated with confidence. This was in stark contrast with the conventional methods employed in the survey which often resulted in conflicting answers due to nervousness, a lack of familiarity, isolation, and having a 'white' person in their homes (See Chapter Six). In addition, the stress of repeatedly answering question after question in isolation limited the method's success. The workshop forum gave participants time to think, speak and share within a process that they could influence, proved far more successful than the 1996 survey that used questionnaire tools (See Chapter Six).

The use of music helped stimulate participants to consider both conservation and environmental destruction. The music lessened the need for probing and active facilitating as it helped to 'channel' participants towards the topic under discussion. The process of passing around of a stick from participant to participant enabled equal sharing of opinion which was also helpful: it ensured that the discussion did not need to be interrupted by myself or the other facilitators having to ask participants for their insights. Clarifying that the holder of the stick was entitled to remain silent also gave those who did not wish to speak the right to do so. On the other hand, if the participant did wish to share their opinion, holding the stick ensured that they were not interrupted or harried. This allowed a reassuring setting in which participants were able to explore western concepts of IWRM by attaching their own meaning and significance to them within the context of their own lives.

8.3.7 Drawing on a Poster: the Concept of the River Environment

The next exercise marked the start of examining the river more closely after having explored some of the broader environmental concerns. In focussing on the river, participants were encouraged to view it in its entirety, including riverine resources, and not just concentrate on the issue of river water. The aim was to

broaden understanding and discussion of the river through the use of a method that would elicit an holistic exploration of the river environment theme. With this in mind, methods such as song, dances, drumming, drawing and sharing were used. Participants formed a circle and sang ‘What is a river?’ while moving to the rhythm of a drumbeat. The interjection of ‘Stop and ask’ (See Plate 8-4) was a signal for the group to stop and draw a component of the river such as fish, trees, water or reeds on a poster (See Plate 8-5).



Plate 8-4 : Participants Dancing and Singing ‘What is a River?’



Plate 8-5 : Participants Drawing Components of the River on the Poster

There was initial hesitation in coming forward with components to draw on the poster. This required a member of the facilitating team to assist in gently drawing out from the participants what they understood by the river and its surroundings. With this encouragement participants drew a diverse habitat with aquatic fauna, vegetation along the riverbank, insects, fish, livestock, geomorphology units and humans. Preparation of the poster helped participants depict the breadth of their local knowledge and reflect the environment with which they were most familiar – the Kat River.

Once the poster was completed, questions around the participants' understanding of the river were posed. Initial contributions indicated that the participants were agreed on the notion that the river is comprised of only its water, as evidenced by the following statement: "The river is water". At this point, it was crucial to spend time considering these statements in light of the participants' poster that showed the river as inclusive of nature and human beings. With the help of facilitation methods (Pretty *et al.*, 1995) that posed questions, referred back to past workshop themes and participants' lived experiences, the team and I encouraged participants to incorporate broader components of the river and to perceive the river as not only water but also as being made up of riparian ecosystems and riverine resources. Given that there were 17 participants in the workshop, many of who spoke Xhosa only, it was hard for me to judge whether all participants grasped and understood this definition of a river. However, I was encouraged by the fact that the workshop activities were specifically designed to prompt participants to repeatedly re-examine this theme.

The poster remained up on the wall for the duration of the workshop. On their own initiative, the participants kept the drawing 'alive' by adding their further perceptions of a river as they gained and learned more in the workshop. This continued use of the poster enabled the participants, the team and myself, to refer to it in illustrating riverine issues as they arose. This was crucial in light of the contradictions that emerged between the poster and the ensuing discussion. This experience led me to conclude that it is most helpful to display and return to any process output, which forms a foundation or basic principle for the workshop.

Backtracking and constant reflection were vital in enabling participants to trace the connections between their drawings, articulated ideas and dramas. This was clearly demonstrated in the exercise in which participants initially drew a holistic interpretation of the river and then reverted to a narrower definition in the ensuing discussion. For example, some participants drew holistic elements of a river ecosystem on the poster but in discussions said the river was just water. The methods by which fundamental concepts can be explored need to ensure that participants feel that they are able to reject, accept it or add to a proposition. Backtracking, for example, allows participants to have a good grasp and understanding of concepts as well as agree that a particular idea has been rejected, accepted or added to. This increases

confidence, which allows progression to the next exercise. Given this, it is clear that a lack of such basic knowledge will alienate participants and exclude them from contributing. This, for isolated, poverty-stricken and disempowered members of a rural community, is familiar ground. Thus I came to recognise how vital it is that a facilitator should be strong, observant and sensitive.

8.3.8 Participants' Perceptions and Knowledge of their Riverine Environment

A purpose-designed story written by Burt (1996) details firstly, a healthy environment and secondly, one degraded by local greed, abuse and neglect (See Appendix 3 Box 3 for the story written by Burt, 1996). This story had been translated into Xhosa and served to provide the context for an investigation of local resources including grasses, rocks, trees, water, soils and natural fertilisers. The investigation was divided into two phases:

Firstly an actor playing the part of a village 'wise-man' told the story. The choice of this character was intended to promote sincerity and to underpin the respect accorded for traditional social and knowledge systems (See Plate 8-6). At the end of the story the actor asked the listeners to reconsider their environment and its resources. He asked for two participants, play the roles of the two chiefs from the story to come forward and open a box (See Plate 8-7). Drumming and clapping marked the opening of the box which contained a collection of natural resources, for example, grasses, firewood, stones. This was designed to enable the participants to explore their local knowledge.



Plate 8-6 : Telling a Story to Set the Research Context



Plate 8-7 : Two Participants Opening the Box

Secondly the community was asked to draw on their experience and local knowledge of the environment. This was achieved through forming small groups and presenting each with a wrapped ‘resource parcel’ taken from the box. Each parcel contained components collected earlier from the local environment, e.g., grasses, leaves, twig, pods, soil etc. Group members were then asked to articulate their understanding and knowledge of that aspect of the environment. This was undertaken initially within their own small group, and later shared with the whole gathering (See Plate 8-8), to explore their local knowledge.



Plate 8-8 : The Groups Examine their Resources

In order to focus attention on the importance of riverine resources, participants were given pink and blue markers and cards to help them identify those resources with a ‘yes’ (pink) and ‘no’ (blue) in relation to the following questions:

- Do you use the resources a lot or a little?
- Do any of these resources bring in money?
- How much money do the resources bring into the household, a lot or little?
- Have any of these resources run out?
- Have any of these resources increased?

The use of pink and blue markers and cards was not effective. I had not recognised that the interpretation of what constitutes 'a lot' of money or a 'little' would be different for each participant. Without a common understanding of the terms, the results have no relevance. There was also confusion, as people did not properly understand the relevance of the markers and cards and the team was overstretched in trying to help.

Fundamental to the outcome of the group discussion around the resource parcels was the community's collective recognition that they possessed relevant local knowledge and skills regarding resource utilisation. There were also, however, comments that environmental knowledge and uses of the past were no longer observed or followed by people in the village. This is evidenced by the following remark by an elderly participant that:

In the old days we used to get the big ones rocks for grinding to make the maize fine. Nowadays people use shops for maize. I can say few use rock now for grinding.

With regard to this, Sibanda (1999) suggests that the breakdown in orally-transmitted knowledge around natural resources is due to the loss in status accorded to local knowledge. My research bears this out, as for the most part it was the elderly rural people who possessed diverse and rich knowledge about their local environment, and such knowledge was not generally held by the younger generation. Sibanda (1999) comments:

Many local people now treat their own culture, knowledge and traditions as inferior to the western knowledge system, and hence are not in a position to take this any further than just talk about it. Their own knowledge has suffered serious erosion over time because it was treated as inferior for so long. Most of the younger people now believe there is little value to their own knowledge and have fully embraced western knowledge (p. 60).

The discussions around the contents of the resource parcels revealed that the components satisfied material, spiritual, medicinal, livestock, dietary, functional, environmental and monetary needs. Specific knowledge of areas where to collect these resources were known and detailed, as an old man explained:

Clay stone used by many people. The Abakhwetha [young males going through circumcision rites], Sanuse [Divine Healers], the Ixhwele [Herbalist or Medicine man] and even used on a child when is still young. This clay stone is found in the veldt. We have to dig half of a metre.

It was clear that the participants possessed detailed knowledge of components of their environment and of the value of the various resources within it (See Appendix 3 Boxes 4 to 8 for the different uses of riverine resources). Participatory research investigations are a vehicle that can mobilise the diversity of perspectives that are context specific. It was also clear that certain uses of natural resources had fallen

away with a concomitant greater use of other components such as wood for fuel and those related to cultural concerns (such as those necessary for male circumcision rites). Thus there was a constant acknowledgment of some practices having ‘died out’. Sibanda (1999) points out that this situation is not unique to the communities of Hertzog and Fairbairn. In his research with the Tongo people of Zimbabwe, he found that oral knowledge may be remembered but not practised. “In most cases in Nyaminyami today indigenous knowledge exists only in theory, people can talk about it, but they do not have any practical experience, nor do they have a full understanding of what it is” (Sibanda, 1999, p. 60).

As Abbot and Guijt (1999) point out, participatory approaches elicit a diverse range of knowledge and perspectives. The inherent complexity of such information does not lead to a simple, one-dimensional answer but rather to a multiplicity of stories that are sometimes in agreement and sometimes not. Within this process, participatory approaches are able to reveal both the advantages and shortcomings of using local knowledge in river conservation and indicate ‘gaps’ that can be addressed by outside conservation methods.

8.3.9 Exploring Mutual Interdependence and Cooperation between Villagers and their Environmental Resources

Performance Theatre and Forum Theatre were used to provide a non-threatening fictional context in which participants were encouraged to analyse their positive and negative environmental practices with the aim of eliciting appropriate management practices of benefit to both the environment and themselves. The methods of Performance and Forum Theatre are discussed in detail in Chapter five, and build on the work of Boal (1992, 1995).

For the sake of coherence and clarity, the narrative of the ‘wise-man’ (introduced in the previous exercise) was used as the dramatic base for the next two contexts of investigation. It was also necessary to capture the people-environment issues relevant to Fairbairn and Hertzog so that participants would be able to recognise the scene and relate to it. In order to do this I drew on information gained from the Survey results (1996), participant observation and discussion with the villagers.

The Background Scene: A Sanuse [Divine Healer] Respecting the Environment

A performance drama was used to set the scene of environmental management systems within the local context. As can be seen in Plate 8-9 an actress played the part of a Sanuse who respected the environment by observing the Xhosa conservation ethic that requires resource users to ask permission from the ancestors before taking resources and respecting the river area as the home of the ancestors (Motteux, 1995).



Plate 8-9 : Sanuse Respecting the Environment

This play provided a context in which observers could investigate changes in riverine management. The co-facilitator acted as the river and gave permission for the farmer to use the water. The resources of the healthy environment were acted out by the Hertzog children described in Chapter Seven (See Plate 8-10). The school children took it in turns to introduce the character they were portraying (e.g. fish, trees, birds etc.) as well as the reasons for their good condition, as shown below:

I am a tree long ago people take care of me.

I am a bird people long ago never killed me.

I am a stone people were building houses but were caring about me.

I am grass people were not burning me but taking care of me.

I am frog I live on the edge of the river and there is no problem.

I am a flower I like singing long ago when people care for me.



Plate 8-10 : Children Acting as the Resources of the River

Participants Reflect on the Drama

After the initial drama participants had the opportunity to reflect on the drama in relation to their lives and to the environment. The background drama prompted the participants to recall traditional conservation codes observed in the Xhosa culture but rarely practised today (See Appendix 3 Box 9 for participants' comments of past practices). Throughout the drama those watching it nodded their heads and muttered as they recognised core cultural themes that showed respect for their ancestors and had resulted in cultural norms for harvesting resources. Traditions included those of women not eating eggs, that the area near the river was sacred and that certain trees were respected. The adults listened to the children and were able to participate by relating the scene to their own situation.

The discussions illustrated that the drama awakened emotions and sentiment amongst the participants as they reflected on the awareness that past conservation systems had fallen away and were not being replaced by new systems. The participants volunteered the belief that people, especially the youth, do not respect their environmental resources. They described this as taking resources without asking permission and being concerned only with their immediate needs. The participants further interpreted their current impact on the riverine environment as negative in terms of the following:

- **Practices** – for example dirty washing water being disposed of in the river, trees being chopped down with impunity, fertiliser being applied in fields close to the river.
- **Neglect** – for example littering, human and livestock defecation at the river.
- **A lack of care** – for example fertilisers being applied without knowledge of the effects on the river system.

Participants identified that harmful environmental practices, that did not observe traditional codes of behaviour, resulted in poor water quality and ill health such as high blood pressure, tuberculosis, diabetes and early aging.

Participants commented that solving harmful environmental behaviour needed to become a community issue that also required individuals to become environmentally conscious. Issues that required community and individual action included the planting of trees, prevention of burning the grass, and the need for the youth to receive environmental education. Some of these sentiments are found in the following quote from a young participant:

Our environment was beautiful and people use to respect it. People use to respect the river. People use to honour their ancestors in the river. Now days people don't respect the things that they used to respect. Things that were not done along the river before people do now. Firstly in the good old days they use to respect the river and the area surrounding. It is important from the environment and these things are important for both of us. We destroy the environment, for human sake. To protect for the environment they are doing nothing. The trees and fishes are less and water is scarce. People help themselves along the river. Just taking. We are now suffering. People are getting old in their young age. People are having illness, high blood pressure and tuberculosis because the river is in a bad state. First we as Xhosa people used to respect the river like not allowing fishing. Simply because people starve of hunger we decided to take fish. There is no honour now for the river. Now can pour back soapy water back in the river again there is no respect at all for the river.

The drama of the Sanuse and the children acting as resources provided a framework in which participants were able to recognise their lives within environmental structures. It brought collective acknowledgment of their lack of environmental management and how this directly affected them. It also highlighted the breakdown of their culture due to oppressive apartheid policies and the resulting lack of further conservation systems being developed. The participants discussed with emotion what was 'good' in the past. They also discussed their current situation of environmental depletion, a lack of community norms and beliefs, and the need to develop a structure that could support the creation and implementation of conservation strategies. Thus this activity of the workshop allowed the participants an opportunity to express their pain, discuss their options, voice their opinions and investigate their situation.

Forum Theatre - The Disrespectful Farmer

In Forum Theatre, a drama opening up key issues that participants can identify with is presented to the spectators. After the first scene, the audience is then welcomed to participate in shaping the drama and trying to improvise variations. At this point the spectators become “spect-actors” (Boal, 1992, p. 40) who take part in and actively shape the drama through their active involvement.

In our drama of the disrespectful farmer, a background scene was followed by another that contained a “social error ... a mistake, a failure” (Boal, 1992, pp.18 -19) or a tension. This is intended to mobilise participants to enter into the drama in order to find ways of confronting their problems and finding solutions. In preparation, the scenes were rehearsed among team members to ensure that there was optimal opportunity for active participation from the spec-actors and to ensure that the actress playing the facilitating role was able to respond appropriately and effectively.

The use of Forum Theatre sought to provide a fictional context with which the community could identify and which allowed for participatory experiences, discussions and problem solving. With this in mind, the actress played the part of a farmer who did not respect her environment. The children assisted her by acting as elements in the environment that she was misusing and exploiting. As the spec-actors watched, they were encouraged to voice their objections and concerns regarding her behaviour. Typical scenarios included chopping down trees, littering, using the river as a toilet, killing birds and washing in the river (See Appendix 3 Box 10 for the script of the performance). The play was first performed with the community as passive observers. Following a discussion, the community was then encouraged to take a more active role in the re-run of the play by articulating objections to the farmer’s actions and identifying possible solutions. This process helped to encourage group interaction, problem identification and the internalisation of key environmental considerations. After the second run-through, the participants were encouraged to reflect, discuss and find solutions.

The drama was fun, vital and challenging and broke down barriers through encouraging active participation. The spect-actors took part in changing the drama by expressing their disapproval of the farmer’s actions and they sought to individually and collectively review problems and seek solutions. Through the actress’s persistent use of the environment in a destructive fashion for her immediate needs, the participants became the voice of the environment. They became united in both their disapproval and their efforts to find ways to change the farmer’s behaviour. The interaction between the ‘farmer’ and the spect-actors is discussed in Appendix 3, Box 11.

Direct consequences of poor or no environmental action were identified as: a depletion of resources that would yield a dependency on market goods; illness; land degradation such as erosion. This reinforced the

need for individual and community environmental management, especially in light of the breakdown in cultural values. This point of view is encapsulated in the following remark from an elderly participant:

Long ago people seen doing wrong were caught by the law but that no longer exists. So people must care on their own.

Participants Reflect on the Forum-Drama

Suggestions concerning environmental management that had been elicited during the drama were reinforced in the discussion that followed the drama (See Appendix 3 Box 12 for participants' reflections). Of these, the need to work together was considered critical. In addition, problems and solutions were considered and suggested; for example, in response to the lack of government and cultural controls, a middle-aged woman suggested that:

People should be a watch dog in each area. To tell people which tree to cut off and to find out which tree to be planted when they cut the green trees.

The first run-through of the drama stood as a foundation for debate around problems and solutions during the second drama. This resulted in the participants shifting between finding a common voice in agreement and, at times, disagreeing. This is illustrated in the negotiation dialogue between an old woman and a middle-aged man quoted below, which points to the conflict between fertiliser use and environmental protection.

Old woman:

I'm having a problem to stop using the fertiliser ... It is not easy to stop this thing of fertilisers as we get more harvest and more money.

Middle-aged man:

Should ask the place where you buy the fertiliser to get the right fertiliser that will not destroy the environment.

Old woman:

If the people could tell us what to do about that would prevent the bad things happening it will be right.

Middle-aged man:

People should ask about using the same fertilisers as it may not work over time. LA 24, people should use different fertiliser not the same fertiliser, like LA 24. People who are selling fertiliser they know certain rules. They must advise you to another fertiliser. That person will say no you must use this one. You don't have to be ashamed. You must be strong. So the people must explain that this fertiliser is making our river dangerous and harmful, so they will give you another one.

Young man:

We are afraid that fertiliser will be more dangerous. I worry about people selling those fertilisers not understanding.

Middle-aged man:

If people are going to carry on using the fertiliser it will make the water dirty and make people sick.

Even a superficial reading of the dialogue between the old lady and middle-aged man reveals the traits of poor communication prevalent in environments that have suffered from oppression (Trudgen, 2000). The middle-aged participant, for example, identified how complex and difficult issues can be for a person who has been marginalised and who has generally not experienced effective communication with the dominant English-speaking culture. Poor communication and understanding prevents people from having choices and understanding the consequences of choices. Consequently, those who are accustomed to experiencing these difficulties simply stop challenging and just accept. The middle-aged participant recognised that in order to ensure a healthy environment effective communication is vital and that it can be achieved by people being insistent and clear about their needs and having the confidence to give supporting reasons. The young male participant articulated his doubt that they would be listened to and their need will be taken seriously.

In the Survey (1996), most respondents characterised the environment as existing largely for human needs, with very few acknowledging and valuing the needs of the natural environment (See Chapter Six). Reflection on the issues raised in the drama, together with focussed group discussions, enabled the participants to raise their awareness collectively, identify concerns and debate actions. The process also made it possible for topics to be crosschecked and viewed from different perspectives, and backtracking permitted themes to be heard and explored as many times as was necessary. It was equally important to aid the participants in their shift from being spect-actors to reflecting on the drama. This was partly achieved by the actress's presence on stage being a signal of the drama about to take place and of my moving onto the stage to signal a discussion (See Appendix 3 Box 11 & Box 12 for the shift from the actress to myself). As advised by Boal (1992), the actress worked hard to make her character clear through the use of expressive actions, voice and costume changes.

The drama not only offered a non-threatening framework for the adults to participate in, but also allowed the Hertzog school children an opportunity to put their learning into action and gain confidence by contributing in their own words. As Boal (1992) points out, Forum Theatre has the advantage of presenting scenarios that are relevant to local people's lives, and it also allows both the participants and

the facilitators to improvise the methods. Both these factors enabled the participants to take command of drama by becoming the voice of the environment and interpreting the information (Nqweniso, 2001):

Community members were encouraged to voice their objections and concerns regarding the actress actions like chopping trees, littering, using the river as a toilet also doing washing in the river. The people became active in the drama. As far as I'm concerned this was because Nicky was so flexible.

8.3.10 Participants Observing their River - Transect Walk

Participants then used a role-play of a river scientist to choose a section of the Kat River along which a transect walk would be held (the concept of a transect walk is discussed in Chapter Five). The intent of the transect walk was to allow the participants to observe and record their environment and discuss important issues with the team. Observation and recording was undertaken by providing the participants with the same worksheets as those used by the children and described in Chapter Seven (See Appendix 3 Box 13 for the transect worksheet). During the walk, participants noted both positive and negative aspects of the riparian zone and were asked to explain their classification on a worksheet. The facilitators helped participants who were illiterate and also prompted, listened and encouraged group discussions at the river site.

The transect walk enabled the participants to take charge of their investigation as opposed to an outsider doing so. As the community members embraced the participatory spirit of the workshop fully, a good rapport developed (See Plate 8-11). All participants took the exercise seriously and even those who were illiterate demonstrated through their enthusiasm that there were no barriers to their commitment.

The villagers were keen and receptive and undertook an extensive riverine study drawing on local knowledge and their own senses. In filling out the worksheets, some formed small discussion groups and others worked alone. Their reports commented on and described diverse environmental components including people, rocks, birds, grasses, weeds, trees, sand, soils and water flows. The villagers included cultural, aesthetic and spiritual knowledge.



Plate 8-11 : Transect Walk Participants Discussing Environmental Issues

These diverse findings were presented to the whole group and the participants statements are recorded below:

- Cause-effect relationships:
 - Those reeds are going to grow more and more and block the river to flow.
 - Pine tree is not good because when there is no water it dies.
 - The foreign trees are also causing soil erosion.
 - Pine tree is not good because when it gets dry or windy days the seed will fall into the river and grow elsewhere.
 - Rubbish at the corner of the river, wood, plastic paper. It is washed by the rain into the river and makes the river dirty. And it comes to the water by the river by erosion that is also made by the people. How do people cause that erosion, by cutting the trees that is preventing soil erosion and burning the grass and after that the erosion will take place and all the dirty things will go straight into the river. If you look at the river now it is not beautiful, is ugly and that causes diseases. Then in the river there is a tree that will prevent that rubbish to pass on and the water in that area will come dirty.

- Negative impacts of poor environmental management:
 - Diesel engine, that diesel used to run in the river. So that I am suggesting that it should be removed from there.
 - When they are cleaning the dip they use to pump out that old dip so this all flow in the river.
 - Grass when it grows in the river it can at a later stage stop that water from flowing.

- When it rains hard the water flows back into dry parts of the river [that is the back water flow effect]. These dry river places flow again and bring the bad things in the Kat River.
 - Furrow along the fields and people use that furrow for drinking and even the species that lives there dies and even the sand from the fields fills up the furrow.
 - When you see water that is green with leaves it is not good. It will cause diseases.
- A review of management options:
 - Trees preventing soil erosion.
 - It is an aloe its roots prevents soil erosion along the river.
 - Dry tree good for firewood. Give a chance for young green trees to grow.
 - Engine at the river has a oil leakage and that is flowing into the river. We want that dip to be closed and build a new one in the right place.
- Acknowledgment of habitat:
 - There is a bird on a tree. That bird likes to build its nest on the tree that goes over the river. Has a nice song.
 - There are stones along the river and inside the river and the frogs likes to stand on them for the sun, also a home for frogs.
- Acknowledgment of cultural value of their environment:
 - ‘Umngcunube’ [*Cape Bush Willow, Combretum caffrum*] which grow along the river and birds like to build their nests. ... Our grandparents believed that the ancestors lived under that tree because there is a house of ancestors. It is a shade of the river and home of birds.
 - Beautiful the river in the old days. This tree was used traditionally and people used to honour this ‘Umngcunube’ tree. It is the shelter for the river.
 - ‘Inxina’ [*Mentha longifolia*] is traditional tea that grows by the river. Old days people with small babies use to drink. Drink the teas as the women can have more milk for the babies. It takes colds and fever away.
- Recognise the value of environmental resources for use now and in the future:
 - Reeds are good because it makes mats and baskets and helps to get money. When someone is grinding mealies those stones is what they are using as a dish. Mats are for sleeping. The top part

of a bush is broken in order to help whack the bottom part of the tree off. Helps collecting wood. Because if you take the tree at the roots it will grow still.

- Aloe good for medicine especially when you have sore stomach. It acts as a laxative.

- Awareness of nature's intricately connected system:
 - Trees have a nice smell and bees use to make honey out of these flowered trees.
 - A flower gives a nice smell also bees get honey from it.

- Aesthetic values:
 - Aloes makes the river look beautiful.
 - A flower gives a nice smell.
 - The environment when it is raining looks happy.
 - To me to visit the river and see those trees is lovely.

The group who conducted the transect walk consisted of participants from Hertzog, the upstream village, and from Fairbairn, the downstream village (See Map 1-2). This assisted in an understanding of the impact of upstream to downstream effects. During the walk itself I was interested to note that although we had not yet discussed catchment scale effects, a young man from Fairbairn recognised downstream impacts on the river:

Saw someone with a red basket doing washing, after doing washing that water goes straight into the river it is dirty soap. The people down the river don't know that people are doing some washing. After drinking that water they will get sick and paying money to go to the doctor.

The flexibility around the transect walk encouraged the participants to make their own choices on how they wanted to carry out their observations and recording of the river, for example, whether they wished to work singly or in a group, which section they wanted to study and which aspects they wanted to discuss. This resulted in the participants constructing and owning their own systems of analysis. The exercise was well placed in the overall workshop program, as the previous exercises had provided a good base and allowed participants to utilise their learning. Having articulated the value of environmental management, they were committed to investigating it. It was also the appropriate juncture at which to change the venue from the project house to outdoors at the river. The change of scenery helped people to mingle and exchange ideas in a different setting, as was observed by Lazaro (1997):

People giggled and laughed at some of the drawings but everyone listened attentively to what was said by each member of the group.

8.3.11 Demonstrating the Concept of Upstream and Downstream

The aim of this exercise was to demonstrate a ‘real life’ cause-effect relationship between the upstream village, Hertzog and the downstream village, Fairbairn. This exercise sought to introduce the reasons for, as well as concepts of, integrated water resource management by means of participants experiencing the effects of poor upstream environmental management. A further element was that such effects necessarily require communication and environmental management plans in order to meet the current needs of human beings and the environment as well as those of future generations.

A homemade model of a rural river (See Plate 8-12) was constructed from a metal frame 1.5 metres long, 1 metre broad and 20 centimetres deep. A gutter was placed in the middle of the metal frame. Before the workshop began, the facilitation team constructed ‘river banks’ on the metal frame by adding stones and sand. Further additions included branches, toy animals, people, cars, houses and a bridge. A water container was placed at one end of the gutter and a bucket at the other in order to simulate water flow. The final effect was a tape recording of a croaking frog.



Plate 8-12 : Homemade Model of a Rural River

Participants were then divided into upstream and downstream groups, each of which was comprised of a mix of both Hertzog and Fairbairn villagers. A member of the group was chosen to ‘regulate the water flows’; this they did by opening and closing a tap. The model was deliberately intended to match the participants’ real life context, i.e., the Kat Dam, Hertzog as the upstream village and Fairbairn as the downstream village.

As previously stated, the story told by the ‘wise man’ served as a basis for this exercise also. Thus in the land ‘Kandodo’, the downstream villagers were preparing for Ingoma’s celebration of manhood and needed to collect sweet water from the Inxuba River in order to prepare Xhosa beer in honour of Ingoma. The upstreamers simulated a 12-hour day that involved activities such as collecting firewood, farming, irrigating and washing clothes (See Appendix 3 Box 14 for the list of activities called out for the forum theatre). Drumming was used to mark off the different hours of the day. The downstream villagers observed the upstream actions, as they attempted to collect a large amount of drinking water in a bucket.

The drama and the implications of upstream users’ actions were then discussed and related to the villagers’ experience. The ‘dam operator’ opened and closed the water supply without any warning. He filled up mugs of water and provided floods. The people living along the river cried out for sensible water flows but he paid no attention (See Appendix 3 Box 15 for the transcript of the upstream and downstream group forum theatre). The upstream group acted out environmental abuses, using those activities that had been identified in previous exercises. For example they washed their clothes and dishes in the river, others squirted ink from syringes into the river (the ink representing effluent or fertiliser drainage), while some drove toy cars around the river banks knocking over trees and creating an erosion effect. Lazaro (1997) reported:

The upriver people were having a lot of fun as they got carried away in their game.

At this point, the downstream users collected a cup of water from the bucket: the water was utterly contaminated by soap, ink, toilet paper, plastic animals and sand. They wanted to put a stop to this and called their chief who took this matter to the upstream village chief. The two chiefs had a discussion but no agreement was reached. The two groups became utterly involved in the drama and both argued loudly for their respective concerns. The person in charge of the flows entered as a mediator but the upstream chief felt he had no power over his people. This prompted the downstream people to demand that the matter be taken to court (see Section 8.3.12).

In the forum theatre between the upstream and downstream users, the participants identified and acted out their own roles in the impromptu drama, shifting them dexterously when necessary. The story was also extended into acknowledging problems such as the difficulties of reconciling the breakdown of traditional hierarchies in tribal chiefs and the encroachment of Western law systems.

The model of the river and the drama enacted around it allowed for discussion of real-life issues in the catchment as well as environmental themes raised in the earlier workshop. This was undertaken by the

participants as they invented the drama themselves and were able to try a number of approaches in dealing with problems arising out of poor land management, such as illness in the context of catchment scale effects. An example of this is the instance in which the downstream village chief opted to take action immediately by communicating with his counterpart upstream (See Appendix 3 Box 15):

Downstream Man:

We must go to the chief and explain the problem.

Downstream Neighbour:

We must go to the chief now and not tomorrow! The water is dirty and our children can not live with it.

A Group of Downstream Participants:

Go to the chief!

Downstream Chief:

What is the problem?

(The downstream users show the Chief the state of their water.)

Downstream Group:

What can be done to solve this problem?

Downstream Chief:

We must go to the Chief of that upper village.

This approach of communication and support amongst the downstream group brought action and direction, but the upstream community opposed their claim. It was only through facilitation by the dam controller that the downstream chief was able to present his problem. Afterwards, the upstream group reflected that holding onto a common vision made it easier to argue for their right to clean water.

The drama started to bring to the surface some of the social dynamics that thwart effective riverine management: people not listening (or refusing to listen), people not wanting to change their ways, people not acknowledging their impact on the river and people not wanting to acknowledge catchment scale effects. This revealed environmental problems as being far more complex than simply villagers cutting down trees, washing their clothes at the river, and waste not being properly being disposed of properly. Lack of communication and understanding of human impacts on the environment within the villages and between the villages and outsiders was a clear outcome of the exercise. It was clear to all that it was these social issues that led to a breakdown in communication between the participants.

The drama provided a thought-provoking structure in which the participants were able to own and explore numerous themes. The team and I welcomed their innovations by encouraging them to take full charge of the drama and for us to take a recording role. There is no doubt that the drama illuminated a range of management issues that I would never have been able to explore in such detail in a traditional top-down lesson or workshop.

A participant reflected afterwards that the drama illustrated key issues for water users dependent on the river for drinking. The participant further stated that it was this exercise that inspired him to continue being involved in the project, because it tackled the relationship of conflict that existed between the upstream village (Hertzog) and the downstream village (Fairbairn). He said that the exercise enabled both groups to appreciate their actions and the need to communicate:

In our village many times we suffered for people upstream lacking respect. So I saw a need to communicate so that it can be easy to communicate with the people along the river for the villages not to experience that bad water

In this particular exercise, the drumming and the frog sound effects did not prove to be useful. The participants needed very little stimulation to come actively involved in playing out the upstream and downstream relations. The sound effects and drumming became incidental and were thus dropped. This highlights the point that any tool should not be routinely applied as the participants are constantly changing as they learn and grow and therefore their needs change. The team and I learnt that every situation is different and that our roles and responsibilities needed to change according to the situation. In this instance, we stepped back to ensure that the participants took ownership of the exercise but took care to remain alert to the potential of conflict arising or the need to stimulate discussion.

8.3.12 The Participants Resolve River Management Disputes in a Court Case

This exercise responded to the participants' call for a court case to resolve their disputes in environmental management. The court case sought to provide a forum in which participants were able to review their actions and the reasons for their mismanagement of the riparian zone. The team and I had previously planned to use a court case therefore, we could respond to this request without delay. The fact that community participants showed initiative by calling for a court case demonstrated how quickly the participatory process had helped them grow as a group and as individuals.

The court case was conceptualised as offering a personal link to a crime in the first person; the focus is on the 'I' and not on 'they' or 'them'. I believed this focus on the 'I' was valuable as it could lead to a critical reflection of self that could provide an impetus for change in that it requires a shift away from the temptation of putting the blame on others. To offset the potential of participants taking personal offence in the mock court case, a dramatic framework was constructed. This allowed participants to: 1) to take on another name, 2) represent the change in their character through a chosen symbol e.g. a hat, and 3) become an active jury to prevent the judges (members of the facilitating drama group) being perceived as hurtful or unfair. Finally, I stressed that this exercise was not designed to accuse or blame people but rather to encourage self-examination and emphasise the importance of seeing environmental problems in the broader social context.

Before the court case commenced, the key environmental abuses were described by the participants and written down on a large poster. The majority of these abuses had been demonstrated and experienced in the upstream and downstream exercise. The poster did not, however, list deeper social issues such as poverty and lack of basic infrastructure.

For the actual court case itself, two of the drama team dressed in black gowns. A South African flag was placed next to a small wooden mallet, a grass mat was placed in the middle of the room and benches were arranged so that they faced ‘the judges’ in rows. This scene was marked by a much more serious undertone than the other exercises but was still interrupted by laughter. Drumming and the entry of the judges announced the beginning of the court case. The team members had expressed reservations that their environmental knowledge was not sufficient for them to perform the role of judges so I worked closely with them and also positioned myself so that they could easily ask me questions.

The actress judge declared the court case open and the process was facilitated by a participant who decided to become the court convenor and called up the defendants and witnesses and asked them to swear the court oath. He also brought the court to order when the jury cried out their disapproval. The upstream and downstream groups defended their case in front of the judges and with various witnesses (acted by selected participants). The judges asked participants to examine ‘why they had acted as they had’ and repeatedly questioned both the offender and witness as demonstrated by the following excerpt of dialogue (See Appendix 3 Box 16):

Accused:

I do not harm, but we are washing at the river. I saw the dirty water running down. Other people are drinking that. Before I didn’t know that what I was doing wrong as no one has taught me before.

Judge:

When you are swimming and washing in the river does it require the education of school as one can just see it. When you sweep the house does this require school education or is it from the learning of the house.

Accused:

No, I learn it from my mother. My mother taught me properly where to throw the rubbish. I am guilty.

The participants acted out their roles creatively, taking on characters and offering narratives inspired by their observations on the transect walk, their experiences in the upstream/downstream exercise and their local socio-physical context. Their admissions, actions or observations were often contained in an

imagined situation or event. There were times when the participants denied the allegations and others when they accepted them and provided reasons. For example, the following is an excerpt from the trial (See Appendix 3 Boxes 17 and 18 for further examples):

Judge:

Can you tell the court when you saw these people undertaking their offense and the reasons why you consider them wrong actions?

Witness:

I saw him doing washing near the river and go to toilet near the river.

Judge:

When did you see him doing these things and where was he going?

Witness :

This man was going to the other village to shop.

Judge:

If you say you saw this man, did you not also go to the toilet there too?

Witness:

I saw him washing inside the river. I also saw him herding the cows near the river. He threw a dead cow into the river. This man does this because he does not want to build a toilet so he goes near the river. On that day the 14 November, he also called to me to come and swim with him in the river. But I did not swim in the river.

Environmental offences were written by the court convenor onto a large piece of paper placed on the wall. These included:

- Burning grass along the river.
- Killing wild animals e.g. the snake.
- Cutting green trees.
- No planting of trees.
- Swimming in the river.
- Using the river as a toilet.
- Washing and throwing soapy water into the river.
- Engine linking oil into the river.
- Blocking the river, i.e., not removing fallen trees.
- Not honouring the environment concern.
- Not listening to the Chief.

The judges, accused, witnesses and the jury took these environmental offences very seriously. To this end, a 15-year jail term was announced and accepted by the accused (See Appendix 3 Box 16 for the transcript concerning the possible jail sentence). However, this jail sentence was retracted provided that

the offenders mended their ways at the grassroots level by working together. The offenders welcomed this as they had publicly proclaimed their guilt and desire for pardon. On reflection, the court case offered an opportunity for the participants to explore poor environmental behaviour by questioning the actions of the accused. It was an examination that clearly illustrated human beings' careless effects on the environment and lack of conscious behaviour.

As was hoped, the court case did facilitate people taking on the 'I' and answering from the 'I'. It focussed attention on the acts of the individual and prevented participants from attributing irresponsible behaviour to others. Equally, allowing participants to take on another name and persona allowed the exercise to take place without participants feeling offended or threatened by the interrogation.

I had also hoped that in the court case exercise participants would be able to evaluate how their socio-historical context had affected their lives. This was not successful as most of the discussions remained at the personal action level (for example, I cut down a tree) and did not manage to explore the deeper causes of environmental degradation (for example, I cut down a tree because I do not care about the environment or I am poor). Possible reasons for this may include my lack of Xhosa or that the facilitators were new to the field of environment and facilitation. These limitations are difficult to overcome in an interactive exercise because of the fluidity and pace which characterises such an activity. I was hesitant to interrupt with interpretations and disrupt the spirit of the workshop. It did, however, prove useful to have two people acting as judges rather than one since I was able to consult with one or the other throughout the exercise.

8.3.13 Seeking Solutions to Perceived Environmental Problems

This exercise aimed to encourage the participants to seek appropriate and achievable solutions through the use of a facilitating framework. The judges asked participants to form two groups in which they could discuss the issues arising from the court case and to explore solutions. Once each group had listed their environmental problems I asked them to consider potential stumbling blocks that could thwart attaining the appropriate goal.

Within the two groups, one member was chosen as a note-taker. The participants actively debated solutions as well as approaches suitable to achieving their goal. These perceived actions for a better riverine environment are:

- Plant trees.
- Use dry wood.
- Protect the birds' habitat by not cutting down all the trees.
- Protect the trees at the river to prevent the increased evaporation.

- Trees are important as they provides shade.
- Must acknowledge the importance and value of environmental management in the local context.
- Have an environmental day.
- Ask Government for environmental advice.
- Call a community meeting to discuss environmental concerns.
- Communicate between each other.
- Dig a rubbish pit and burn it.
- Stop littering.
- Stop washing at the river.
- Keep our river clean.
- Need to care for the river as it is important for irrigation.
- We will get sick if we do not care for our river therefore, conservation is important.
- Build toilets.
- Dung should be encouraged more than fertiliser.
- Move the dip far from the river
- Cattle must be kept away from the river
- Ask Government's to build a bridge at Fairbairn

The court case put the problems into context and enabled participants to evaluate them within their local context. Careful and critical thought ensured that solutions were not merely accepted but also challenged in terms of their viability. For example, a solution to the problem of human waste in the river was considered to be the building of pit latrines but it was further noted that the hardness of the local rock, the advanced age of many of the participants, and a lack of machinery and money presented major obstacles. This process, while thorough, was also time-consuming and each point was not given sufficient attention. Consequently, in the subsequent workshops similar to the one described here I adapted the exercise so that participants were split into more groups focussing on only two issues.

The participants together agreed to prioritise three community actions that they needed assistance with: 1) the need to build a bridge over the Kat River, 2) holding an environmental day, 3) the need to communicate. Holding an Environmental Day was intended to provide a symbolic event as a watershed for change in the community and individual behaviour. Participants believed that a public celebration would encourage people to come together at a start of a journey towards IWRM. These priorities demonstrated respectively community concerns about access when the Kat River was flooded; further disseminating environmental knowledge within the villages of Fairbairn and Hertzog; and weak linkages between stakeholders and decision makers in the Kat River Valley. The participants stated that they

would feedback the workshop proceedings to other community members. One of the participants said that he had taken the following steps since the workshop:

“Invited people to the meeting and told them about what we have learnt. That is why we are ill and sick because we are no longer respecting the river. And we told them to keep the water clean.”

Both the community and I subsequently completed all priority actions identified by participants. However, in this thesis I will focus on the role of building capacity for marginalised people to communicate their environmental needs to one another, to the broader catchment community and to outsiders (as described in Chapter Nine). The other activities, relating to institutional arrangements for IWRM, were not directly relevant to the research aims.

On reflection this last exercise allowed participants to appreciate the deeper social context in which environmental care is embedded. It established that although the community often had a detailed knowledge of their resources they sometimes lacked the ability to solve existing crises, particularly in terms of an issue such as land tenure that depends on an external, political process. Naturally, financial and skills constraints served as an additional obstacle to local action. This did not however imply that a local, appropriate solution could not be identified or that motivation could not be made to an external agency. For example, high sediment discharge on a particular river channel led to the community requesting a scientist to advise them and a subsequent application to the Department of Public Works for corrective action.

8.3.14 Evaluation of the Environmental Awareness Workshop

Participants willingly engaged in reflection on the environmental workshop by filling in an evaluation questionnaire (See Appendix 3 Box 19 for the survey and responses). Facilitators helped participants to fill in the forms and wrote an evaluation report on the workshop. As the workshop was running late and one respondent needed to get back home, the survey was completed by sixteen participants.

The survey revealed that 100% of the participants enjoyed the workshop and the opportunity to learn to work together on issues that were relevant to their context. Key to the participants' learning was their growing appreciation of the importance of nature and the need to respect it. The survey indicated that 94% of respondents saw the need for change in household and farming practices such as chopping down young trees, defecating in the river, killing river animals and the use of fertiliser near the river. Further, the workshop encouraged participants to value the need to observe, study and monitor their own

environment in order to ensure a healthy, aesthetically pleasing environment in which good management practices could become a characteristic. Throughout the survey the respondents perceived that the quality of the river water was important for human use by the majority of the respondents, for example, one participant said:

Preserve and care for the river as it is the source of life to many creatures including human beings.

The environmental workshop took place over two days giving participants the opportunity to report workshop activities to their family and friends. The survey indicated that 100% of the respondents had transferred their learning to their family and friends. The message transferred by 50% was that environmental care was important in bringing about a healthy environment, a further 50% had conveyed the need to change environmental practices such as waste disposal and unrestricted harvesting of trees. Of the 16 participants 94% of respondents stated that the workshop had encouraged them to review their own environmental relationships. Some themes that the workshop had taught participants included the highlighting of poor environmental practices and that environmental care will lead to a better world. For example, one said:

I know things that I didn't know. I found out about my mistakes because I didn't know that the river is so important. Respect, conserve and love the environment. The world will thus be more beautiful and happy".

All of the participants identified conservation methods that they could implement. These data are presented in Table 8-1.

In contrast to the survey undertaken in 1996 (See Chapter Six) in which the majority of respondents believed that conservation was not a reality due to their poverty, lack of education, insecurity of land tenure and social upheaval, 64% participants stated that 'nothing' prevented them from carrying out conservation practices. Seven percent stated that prior to the workshop they had lacked environmental knowledge. Of the 16 participants 14% stated that their current non-belief in cultural conservation practises prevented them participating in conservation practices as they did not respect their ancestors and did not see the need to ask for permission to take care of environmental resources. However, 14% of the participants stated that natural occurring events resulting in degradation hindered them from managing the environment to a pristine condition.

Table 8-1 : Changed behaviour for IWRM identified by participants (n=16)

Changed behaviour	Frequency
To take environmental care measures through running programs and in daily practices	94%
Planting and sustainable harvesting of trees	63%
Advising people not to harm the environment in meetings or when they witness poor conservation behaviour	56%
Stop littering	56%
Building toilets and defecating away from the river	38%
Fencing to prevent livestock eroding river banks	19%
Using appropriate environmental friendly fertilisation	19%
Plough away from the river	19%
Washing clothes away from the river	13%

Further evaluations of the environmental awareness workshop of 1997 were gained through activities carried out in Phase Three. Fairbairn and Hertzog participants evaluated and provided detail of the environmental awareness workshop themselves. McDermott, an administrator who was employed to write a competition entry independently of me, recorded the statements of the participants. The following excerpt from McDermott's (2000) competition entry for the Nedbank/Mail & Guardian Green Trust (Described in Chapter Nine) provides an evaluation of the effects of the environmental workshop.

This workshop was destined to be the first of many. And in each of the following workshops, the communities' inherent environmental knowledge was constantly acknowledged and affirmed, with the use of drama, role-playing, art – all intended to create a lively, stimulating, consciousness-raising forum.

The major achievement of these workshops throughout the years 1996, 1997 and 1999, and those ongoing, is that the members of the Hertzog and Fairbairn communities claimed ownership of their knowledge and their need to care for the environment, particularly the river. Examples of the environmental awareness that characterises this community can be found on the opposite page. [Visuals of notes made participants in workshops.] These points were all spontaneously offered by individuals in the communities and the effects of redressing (what were) commonplace activities such as washing in the river, using the river as a dump or a toilet, are clearly visible at the site. [Before and after photographs of a site.]

The children in the villages are also an important part of the process. Their contributions through drama and drawing and discussion are a valuable part of the growing environmental awareness in the community. Sometimes, the children's insights pre-empt those of their elders, giving them a pride in contributing positively to their communities' well-being. In every instance, a Kat River Valley Project workshop is an open forum, where every member of the communities' point of view is considered valid.

Journalists interviewed participants from the environmental awareness workshop that enabled participants to have an independent opinion about the project, in a newsletter produced for the Kat River Valley project (KRVP). Some of these interviews reflect on the environmental awareness workshop (See Appendix 3 Box 22):

Interview in Hertzog:

Journalist 1:

Please can you tell me what you gained from the environmental workshops in 1997?

Respondent:

After Nicky came into the village with the project we've gained a lot, I feel alright now, because we are now using clean water. I know how to look after the river now, and how to keep the place where I stay clean, not full of plastic that are like flowers around the village. These plastic are very dangerous to animals because when they eat it they die. People used to go shopping and throw plastic away where the animals can eat it. Now when I see plastics I pick it up. Things are better now, But that is not to say I was sick before, now I just feel healthier.

Journalist 1:

Did it help you?

Respondent 1:

Very much, we learnt much.

Interview in Fairbairn:

Respondent:

First thing which is important to us all is that we improve the environment of the river and our health as well.

Journalist 2:

Do you think that things have improved already?

Respondent:

Yes, they used to wash next to the river, now they don't do that.

Further participants' reflections are recorded in Appendix 3 Boxes 20, 21 and 22. These evaluations allowed me to evaluate the achievements of the environmental awareness workshop in relation to the objectives set in the report back workshop held on the 15 of May 1997 (See Section 8.3) and to ascertain the effects of the research.

I learnt that participants evaluated and commented on events throughout the research process and therefore evaluation was not necessarily limited to one exercise in time. I also found that evaluation comments transpire from numerous sources, for example reports written by other researchers, articles written by journalists, team members' reports or feed back. This revealed to me the importance of being continually open to participants' reflections not just after the event but through the process. The collection of participants' evaluations of the environmental workshop contributed to Phase Three in which nine environmental awareness workshops were planned and implemented with other marginalised communities in the Kat River Valley (See Chapter Nine). In addition to evaluation helping to direct activities in Phase Three of the research it also formed part of a self-reflection for the team and me.

8.4 Sharing Experiences from the Environmental Awareness Workshop

The findings and learning gained in Phase One and Two of the project were presented at the South African Society of Aquatic Scientists (SASAQS) conference in 1997 in a joint paper, Motteux and Rowntree, (1997). The SASAQS conference is a biannual symposium attended predominantly by people involved with technical, policy or natural science aspects of water resource management. With water policy changing to one calling for participatory approaches my presentation was well attended. Members of the audience commented afterwards that the talk had effectively demonstrated participatory methods in an innovative way and it was for this reason that it was awarded the student prize (SA Waterbulletin, 1997).

8.5 Conclusions and Reflections

In this section, I reflect on key lessons gained in Phase Two of the research. I reflect on the feedback workshop of the 15 May, 1997; the importance to appraise the investment in light of the research objectives; the environmental awareness workshop; the importance of management and leadership; the benefits of identifying overlapping needs; recording; and the unfolding research approach.

8.5.1 The Feedback Workshop: 15 May 1997

The report back workshop held on the 15 May 1997 was a key turning point in the research. It became central to establishing riverine management plans with the people of Fairbairn and Hertzog who have

been marginalised to ensure that the working relationship was based on respect and honesty and was one that encouraged participants to think. In this, it was vital to articulate results and findings clearly so that others are able to understand and listen. This forum provided participants the opportunity to break with their oppression by gaining control of their lives through believing in themselves – in their knowledge, in their voices, and in their minds and hearts.

A key lesson of working within participatory values was the importance of reporting on findings to Fairbairn and Hertzog people and ensuring that they understood the information. I found that once participants understood and owned the information they were able to make use of it in decision-making and this also increased their ability to take charge of their own development.

Working with the community to identify our overlapping needs resulted in a relationship with clearly identified roles and responsibilities, which in turn led to the preparation, planning and undertaking of the environmental workshops. It was through this process that participants became better informed of the project and became more committed to it. Similarly, Adkins' (1998) work in Tanzania with poverty alleviation found that "if this cell is better informed, enabled and motivated, it will produce more, develop greater security and enhance its livelihood" (1998, p. 44).

The process of reflection enabled Kate Rowntree and me to present the work at the July 1997 SASAQS symposium in an open manner that enabled water resource managers to learn from my research journey of failures, successes, hopes, methods and reflections (Motteux and Rowntree, 1997). It was important to be honest about both failures and successes as the former represented a learning area and the latter, platforms for future work.

8.5.2 Investment must be Appraised in Light of the Objectives

In running the initial phases of the research on a limited budget, I became aware that all plans require an investment – human, financial, technological and so on – which I had to appraise. I found that integral to this assessment was the perceived strengths and weaknesses of outcomes which determine how best to make use of a particular investment. Such an assessment required viewing both past trends as well as the current situation in order to make an informed decision. Important too, was the reliability, quality and efficiency of the investment in allowing the stakeholders to become and remain an inclusive part of the process. I found that I needed to rigorously appraise each investment and determine both its strengths and weaknesses in order to ensure that I would meet the goal and ensure that vast sums of money were not necessary.

8.5.3 The Environmental Awareness Workshop

In discussions in the workshops it was clear that participants recognised the following as abuses: throwing dirty washing water into the river, litter, using poisonous fertilisers, and human and livestock waste entering into the river. Further, people were not chopping down trees selectively, not respecting their ancestors and burning the grass. In these discussions there was a strong emphasis from the older people that cultural systems should be observed, yet the other participants believed that the issue did not depend on returning to 'the old ways' but in requiring that people become responsible. Many of the younger participants said that they had gone against cultural laws and had not been punished and therefore did not believe in the 'old ways'. The meeting enabled participants with different belief systems to recognise that they had an environmental problem due to there being no culture of care.

The tools and methods used in workshops cannot be understood as 'cookie-cutter solutions'. As my work progressed, they were reworked and adapted to different situations. They were helpful in allowing participants to consider options, communicate changes, bring different perspectives to a situation and build knowledge and confidence. Training and hands-on work encouraged the facilitating team members to see the strength of adapting tools and being innovative, as the following comment from a team member indicates (Nqweniso, pers. comm., 1999):

I go in thinking I am going to act or say something but I then change to the situation. I find that I am always changing.

Empowerment of participants was understood as occurring within them. This involved the building of trust and confidence and enabling participants to have a voice. This, in turn, enabled members of the community (collectively and individually) to take positive action in seeking solutions to their perceived problems. One of the most fundamental outcomes of this process was the community's collective recognition that they wanted to learn more as they did not feel confident about their environmental knowledge. Through the participants' search for their knowledge and my search to provide a platform for them on which they could explore their knowledge, we developed a working relationship based on trust and understanding.

The participants enthusiastically articulated their local knowledge and actions required for sustainable use of the environment. The community's realisation that they had the ability, the foundation and the right to improve their own environment flowed from the process which had taken place. The participatory research process ensured that the community retained control of the development process and in so doing they became empowered. This laid the basis for initiating sustainable environment management. The work enabled joint-learning in which the roles of facilitator and learner were frequently switched, leading to empowerment and a sense of self-fulfilment.

The gradual shift from the 'dominant' orientation released the work from a search for the 'single truth' of local people's conservation practices and enabled the research to recognise the complexity, multiplicity, tenuousness and indeterminacy of most human experiences. This resulted in the gradual shift of the inquiry from being concerned with the quantifying of knowledge to focussing on emancipatory knowledge. This is knowledge that "increases awareness of the contradictions hidden or distorted by everyday understandings, and in doing so it directs attention to the possibilities for social transformation inherent in the present configuration so social processes" (Lather 1986, p. 259). The search began to become more concerned with providing ways to build confidence and celebrate the peoples' many stories. In my experience, key to building environmental care among oppressed people was the necessity of encouraging participants to learn to gain a voice, work collaboratively and understand the contradictions inherent in conservation. Equally, emancipatory research needs to be respectful of the experiences of people in their daily lives.

The Environmental Awareness Workshop (Phase Two) was compared with the structured interview survey undertaken in 1996 (Phase One). The former led to participants questioning their environmental use and articulating the need to seek better environmental management systems, whereas the latter did not. For example, in the survey, respondents acknowledged that unsustainable tree felling was not a good practice yet only a few respondents acknowledged the implications for the river. The survey did not challenge respondents to change their behaviour or to consider the consequences of soil erosion on the river environment. Within the workshop setting, however, participants came to appreciate the value of trees as a human resource and the need for environmental care. This collective understanding prompted participants to question their practices and seek alternatives that could meet environmental and human needs. Furthermore, the workshop participants came to understand upstream and downstream impacts; appreciate the river as a broader concept than merely a body of water; review past and present conservation systems; and acknowledge the consequences of litter, poor waste disposal and farming practices for the river. In the evaluation after the workshop, 97% of the respondents gave clear and comprehensive answers. These evaluations were in stark contrast to the structured interviews that exhibited confusion, contradictions and low responses.

Respondents in the 1996 survey claimed that they utilised environmental resources to satisfy spiritual, material, medicinal, livestock, dietary, functional, environmental and monetary needs. On the surface, it appeared that participants had good environmental knowledge, yet comments in the environmental awareness workshop showed that detailed knowledge of the trees, herbs and plants for food, medicinal and spiritual use was not universal. It was held by a select few, mostly from the older generation. Most of the participants had a good grasp of environmental knowledge as it pertained to daily needs such as wood for fuel or clay for male circumcision rites.

Like Sibanda (1999), I found that the assessment of local knowledge is complex, as such knowledge may be verbalised but not practised. Local knowledge is not known by ‘everyone’ – there are many ‘gaps’ and varying levels of understanding or interpretation. Local knowledge is not neat and tidy. It is not seen from only one perspective as it may fulfil basic needs as well as spiritual needs. It is also necessary to be wary of romanticising local knowledge, as it is not free from abusive practices such as environmental over-exploitation, overgrazing, deforestation and pollution.

Due to its complexity, I believe that local knowledge is difficult for outsiders to comprehend. Local knowledge has become romanticised as the solution to the environmental problems – outsiders may believe that going back to traditional practices will solve environmental problems. This trend towards the nostalgia of local knowledge has seen much research focussing on the collection of local knowledge, with little benefit for the community (Sibanda, 1999). Such information is collected by the researcher without the villagers having a say in what is important or how it should be framed.

The National Water Act (1998, No. 36) has given local people more opportunities for their knowledge to be observed and recognised. The local institutional bodies, such as Water User Associations (WUA) and Catchment Fora (CF) set up by Department of Water Affairs and Forestry (DWAF) invite stakeholders to become part of these structures so that they can have their voice and express their own needs. In this way, a context is created in which local people can make changes to their own situation and are not reliant on outsiders conveying their knowledge to the necessary institutions. In this context, I believe that the researcher’s focus should be on building the capacity of the local people so that they are able to articulate what is important in their local knowledge, so that it can then be incorporated into policy.

8.5.4 Management and Leadership Responsibility

When we began running environmental workshops neither the participants nor the team felt that they had the skills and knowledge to lead such an exercise. Within this context, I became aware of my responsibility to lead, compose agendas and mobilise and motivate staff through negotiation and communication. Therefore, I found that my responsibilities as the researcher included guidance, as well as a range of other tasks. In such a rapidly changing setting, leadership is less in the style of governing the everyday running of the project, and more in the capacity for coping with change. Management in the former style is important, of course, but it is the flexibility necessary for coping with change that is vital.

Similar to Leitko and Peterson (1982), I found that task allocation and responsibilities should be negotiated to prevent misunderstanding and tension. Clear task allocation and negotiation of ‘who is responsible for what’ needs to be openly discussed. If the workload was large, it was important for the

tasks and the responsibilities to be rotated. Thus it was necessary for the team and I to be fully informed of the unfolding plan and participatory design in terms of the project's tasks, responsibilities, rights and boundaries.

Although I found that role allocation is undeniably important, participatory work is dependent on self-motivated, sensitive facilitators with an appropriate sense of initiative. Such facilitators need to be able to recognise and critically reflect on a situation and, if necessary, act effectively. In these situations it is difficult to allocate roles, as such activities are part and parcel of the spirit of participatory work. In fact, a 'do-it-my-way' style of managing can be less than effective here. I started to see the value in encouraging and enabling the staff to reflect critically on an issue and then act appropriately. Thus a role can be taken and owned by the individual, with comment and assessment on performance coming later from the team.

Since my attention was focussed on everything that was happening (both on and off the stage), I was able to become more of an observer, listener and learner. I was also able to join in the fun and lively spirit of the exercise. The supportive attitude and clearly defined roles of the facilitating team enabled me to let go of the process and watch as the participants engaged in the learning environment. The team took full responsibility for each role that they undertook whether it was keeping notes, acting, moving props, facilitating, providing food, listening or asking questions. The team's confidence and trust in themselves and each other flourished as they began to acknowledge their skills, their ability to work as a team and the enthusiastic response from the participants.

The young actress employed as a facilitator made use of her dramatic abilities to captivate and inspire audiences as an individual, as well as bolster the performance of a group as a whole. She quickly grew in confidence and was able to communicate very well with others, whether they were team mates or participants. She also enjoyed developing a working relationship with all those she came into contact with. In terms of audience participation, in particular, she was very skilled at evoking responses and involvement. She was a flexible worker, easily able to adapt the dramas to cater for 'spec-actors' by posing options, offering challenges and incorporating the audience's comments into the piece. In this way, her skills allowed her to motivate audience involvement, which is a fundamental characteristic of the participatory research.

It was important that the team members grasped and communicated clearly concepts such as river conservation, and environmental care and management. This project also provided team members with the opportunity to add new skills to their portfolio, such as note-taking, report-writing, management of workshops and running meetings. Building the capacity of formerly disadvantaged people to work on the project instead of employing consultants was a key objective of this work. Two members gained

confidence and were successful in obtaining other employment and another member continued working for the project in Phase Three. A team member commented that gaining new abilities was one of the experiences that they valued most (Nqweniso, 2001):

From the process I have learnt lots of things such as how to communicate with other people like other language-speaking people and I was also encouraged to communicate and negotiate with outsiders through the body language etc. During the workshops I have learnt to learn the atmosphere of the house at large while making speeches or anything. As I would like to do the course of Human Resource Management in the Faculty of Commerce, this research project will pave the way for my studies.

8.5.5 The Benefits of Identifying Overlapping Needs

In the area of employment and remuneration, I found that many practitioners and staff members have a great deal to contribute. For instance, both the photographer and the environmental educator had expressed an interest in learning and being exposed to rural development work. Through a discussion in which we identified our overlapping needs, a partnership was created. I ensured that they would gain their articulated need (e.g. experience) and they agreed to assist me at a lowered fee. I also found that it was important that this partnership was never taken for granted.

This collaborative spirit began with recognising and talking through our overlapping needs. This process also allowed a shift from me being the sole driver of the work and feeling lonely and confused, to the gradual incorporation of community people in the decision making, the direction and functions of the project. Recognising our overlapping needs resulted in being able to map out roles and responsibilities. In my role, I needed to develop a constructive environment that could enable local people to share and come together. This required training a team of facilitators, working with the children as well as the adults, and seeing to the usual logistical concerns.

8.5.6 Recording

In order to record and translate the proceedings for the purpose of analysis, I made use of a video camera in Phase Two. This allowed me to focus on the participants and my behaviour and not be wholly concerned with taking notes. All workshops were recorded on videotape and were also photographed. The photographer found that videoing often was difficult due the changing environment and also because participants were often spilt up into small groups. This resulted in a lack of detail in the videos, although it did enable the team and I to give full attention to the participants (Lazaro, 1997):

The participants were initially a little wary of me, they say this woman came with still and video cameras. Nicole explained my function and after we played a game of introductions the people accepted me and proceeded to ignore the constant camera invasion. The workshops were so

intense and difficult to record both photographically and on video that it was always a relief when we stopped for tea or lunch. However, at these moments I still wandered about with a mug of coffee in one hand and a camera in the other.

The photographs taken by Lazaro were extensively used throughout the project as a means to communicate the story of the project to outsiders, funders and to the local stakeholders. The visual presentation brought the project alive and made it accessible. Lazaro (1997) and Motteux & Lazaro (1999) produced a visual documentary that traced the course of the project. This documentary was widely exhibited as reported by Lazaro (pers. comm., 2001):

The colour and black and white photographs were effectively used as a visual recording of what the project was all about. It made all the theories and explanations more tangible to those unfamiliar with the rural conditions and environment. The photographs gave the community a 'face' and a 'voice' and highlighted the human component and their situational difficulties. Officials and funders unfamiliar with the conditions and the people of Fairbairn and Hertzog were given a unique perspective that words could not provide. Thus photographs added to the credibility of the project and made the study accessible to those outside the Social Sciences.

8.5.7 The Research Approach

Unknown to me at the start of the project, the participatory process would lead to a radical shift in my research approach as it was modified to meet the needs identified and mutually agreed upon with the participating stakeholders. According to Lundström (1998): "collaboration involves the development of partnership. Within this process there is a need for all parties concerned to jointly define and develop their roles and responsibilities" (p. 31). When the project entered the second phase, I acknowledged that the project was not evolving as I had planned initially.

In Phase Two, I started to engage in a dialogue with the stakeholders in order to encourage joint planning and to ensure that the research work corresponded to the stakeholders' interests and that they would have greater ownership of the process. I also came to acknowledge that the development process is also about questioning myself and that it was necessary to be accountable for my actions.

9 Phase Three - Group Growth in the Kat River Valley

9.1 Introduction

This Chapter introduces Phase three and presents the outcomes of institutional development activities conducted with participants in the Kat River Valley. Phase three drew on a suite of participatory philosophies including PRA, Theatre for Development and AR and sought to answer three core questions:

- **Priority setting** - How to identify and focus stakeholders' priorities for action?
- **Participation** - How to involve stakeholders in catchment-scale decision making?
- **Independence for sustainability** - How much IWRM activities can marginalised people do for themselves within and after the project?

As such, this chapter is about responding to the concern and desire among stakeholders to take action to make improvements to their lives through activities directly or indirectly linked with catchment-scale IWRM.

Phase Three builds on the experiences and lessons learned from Phase One and Phase Two and further explores the participatory philosophy, methods, activities and results developed from working at a catchment-scale to enable stakeholders to participate in integrated water resource management (IWRM).

The methods used in Phase Three - Action Research and Participatory Rural Appraisal (PRA) and Theatre for Development highlight that the planning and implementation process of the activities concerned with building a new bridge in Fairbairn facilitated building of broader IWRM capacity amongst participants. The use of Action Research and PRA enabled more active participation in formal institutional arrangements for IWRM – in particular the formation of a Water Users Association (WUA) and a Catchment Forum (CF) in the Kat River Valley. As Fairbairn stakeholders understood and engaged as a group in building the bridge through working with the Department of Public Works, an outside agent, their confidence and skills evolved in terms of engaging with outside authorities and working with existing institutional arrangements for IWRM. This resulted in them evolving from group initiation (where they began to identify as a group with a common purpose) to group growth (where they were able to work towards communicating effectively and wanting to solve problems and change their situation at a local and catchment scale). I adopted Action Research to contextualise the research and to bring about change in Phase Three because this phase was characterised by a shift in emphasis from awareness building and group initiation to planning and implementing activities as well as group growth.

Phase Three of my research journey commenced with facilitating participants to solve a specific problem at the village scale and evolved to enabling participants to plan and organise at the catchment scale. This section shows how a local concern of upgrading a low-level bridge at Fairbairn was a catalyst for working with diverse Kat River Valley stakeholders and the Department of Water Affairs and Forestry (DWAF) representatives to jointly establish a water management institution that would enable communication, representation and active participation of formerly marginalised groups in catchment-scale IWRM.

The Chapter is structured as follows. In Section 9.2 I describe how research activities implemented between 1997 and 1999 were initiated at a local scale, with a focus on how the Fairbairn and Hertzog communities actively identified a low-level bridge as a problem and the activities implemented to resolve their concern at a local and catchment scale. I then discuss the direct outcome of the initial focus on the Fairbairn bridge - the need to establish a water resource management institution so that the communities could engage with implementation of the National Water Act (NWA). This resulted in the formation of a Water Users Association (WUA) and a Catchment Forum (CF) in the Kat River Valley.

In Section 9.3 I discuss the evolution of research activities and community awareness from local village scale to catchment scale and expand on the implications of the shift from the local village scale to the catchment scale. This included a focus on AR and PRA methods and my role changing from a researcher to a practitioner and co-learner, whilst working with a team of six grassroots facilitators and student trainees. I also discuss the involvement of diverse stakeholders in identifying and participating in their development of a water management structure.

In Section 9.3 I also introduce the three core questions that are answered in this Chapter using selected examples from a much wider range of research activities (see Appendix 4). To illustrate the evolution of methods as the capacity of participants also evolved. Each example is presented as a stand-alone case study to illustrate the key findings from Phase Three. The outcomes of each example activity are also presented.

In Section 9.4 I outline the activities leading to formation of the Kat River Valley WUA and CF. I then outline responses to the three research questions posed in Section 9.3 in Sections 9.5, 9.6 and 9.7 respectively - using examples of some of the methods and activities of Phase Three research to illustrate results and reflections from 1999 to 2000. Examples are used to outline responses to the three research questions because Phase Three involved a very large range of activities that are too numerous to include in an exhaustive and chronological list (see Appendix 4 Box 1 for a list of the key activities). The focus

was on supporting the community participants to establish a CF and WUA. Because a WUA is a statutory body described in the NWA, and because the water reform process in South Africa encouraged transformation of existing irrigation committees into WUA, the initial focus of Kat River Valley participants was on establishing the WUA. Section 9.6 therefore uses establishment of the WUA as the example to illustrate results and reflections responding to the first research question. Community participants from Fairbairn and Hertzog participated actively in the formation of the WUA, but also wanted to establish a CF to more clearly establish their role in water resource management in the Kat River Valley. Section 9.6 therefore uses the example of community motivation for a CF as the example to illustrate results and reflections responding to the research question about participation in decision making.

At the end of the Chapter, in Section 9.8, I reflect on the evolution of stakeholder groups for effective participation and comment on the status of participating groups at the end of the research activities. This provides the basis for reflection on the core themes and processes involved in building capacity to actively participate in IWRM.

9.2 The Initiation of Phase Three at the Local Scale

After the environmental awareness workshop held in Hertzog in June 1997 (as described in Chapter Eight), the priority water resource management problem identified by the Fairbairn and Hertzog participants was the inconvenience, disruption to pedestrian traffic (particularly schools children) and occasional loss of life triggered by unpredictable releases from the Kat Dam at Sand Bridge in Fairbairn. The bridge is located on the Kat River at the junction of a tributary (See Map 1-2). The cause of the inundation of the bridge was sedimentation and sand deposits in the river bed and blocking of culverts.

The Hertzog community members participating at the environmental awareness workshop agreed that they would support the Fairbairn community to build a bridge even though they would not directly benefit from the project. The Hertzog workshop participants agreed that since the bridge was causing loss of life it was a priority issue.

The participants defined the problem in terms of seemingly short sighted solutions. For instance, they identified the solution to the problem of safety of crossing the Kat River during high flows as building a higher bridge. By doing so the participants focused on the symptoms of the problem and not on the cause of the problem and became fixed on building a bridge. Although the research activities did enable the Fairbairn community to build a new bridge, much time was spent with the participants to develop a deeper understanding of the cause of the problem. This was initially difficult, as the participants

collectively believed that they had identified the problem and thought that by building a bridge they had the only solution needed. It was only as they developed an understanding of catchments and IWRM that they realised a solution that addressed the cause of the problem was also needed.

In the Phase Two Environmental Awareness Workshop (see Chapter Eight) the participants and I agreed that it was important for us to work with experts to find more information concerning the causes of the problem. Reflecting on the methods of the environmental workshop of 1997 I decided to use a transect walk – something the participants from the workshop felt relaxed about and confident in undertaking. Because workshop participants were familiar with this method I felt that they would have the confidence to implement it with outside experts. All parties agreed to a transect walk along a tributary of the Kat River adjacent to Fairbairn that was depositing the sediment that blocked the low-level bridge and caused flooding. Participants agreed that the transect walk was the best way to blend scientific and local knowledge to generate ideas concerning the cause of the problem. This resulted in the community people holding an environmental day on the 6 of June 1997 in which they invited Kate Rowntree, a Fluvial Geomorphologist from Rhodes University, and her post graduate students in the field of geomorphology to work with the interested community members from Fairbairn and Hertzog (Barrett and Ziervogel, 1997).

On the 6 May 1997 the community members had, on their own initiative, prepared a poster that presented the time, location and purpose of the Environmental Day. The community members had put up the poster in a central location, on a tree at the low level bridge where many community people of Fairbairn collect their water and firewood as well as passing to go to school, the shops, agricultural fields and to visit one another.

The community participants from Fairbairn and Hertzog, Kate Rowntree and the Geography Honours class, Natalie Barrett and Gina Ziervogel were given the transect forms used in the Environmental Awareness workshop. The community participants formed groups to ensure that somebody from each group could read and write down their observations as they undertook the transect walk.

The purpose of the transect walk was for the community participants in their groups and the Fluvial Geomorphologist to record and analyse the variables causing the high sediment load at the bridge. The transect walk took place along a tributary of the Kat River with the participating community members, outside experts (Fluvial Geomorphologists) and me. The participants and the Fluvial Geomorphologists recorded their observations as they progressed along the transect walk.

At the end of the transect walk the participants and scientists shared their findings. One of the main causes of the problem at the bridge was the high sediment load from the tributary that blocked the culverts of the low-level bridge. Although the participants acknowledged that it was important to solve the sediment problem through using soil conservation measures to reduce soil erosion, they were still convinced that building a bridge would solve their problem. The community participants asked Kate Rowntree and her students to write a report for them, and asked me to continue working with them to facilitate construction of a new, higher bridge. All groups agreed to these tasks.

Up until now the investigation of the natural resources and exploration of participants needs had moved at a quick pace. However, I still felt that some workable solutions to the causes of the problem also needed to be found since a higher bridge would not guarantee a long-term solution to the problem of river sedimentation and releases of water from the Seymour Dam. I expressed my concern to community participants that the bridge alone was unlikely to be sustainable because a solution to the cause of the problem had not been found. Because people were concerned about the flooding at the low-level bridge the Fairbairn participants were willing to explore the problem further. Participants from Hertzog also recognised the flooding problem at Fairbairn as a priority issue, and were willing to participate in the further exploration of it.

As a result of these discussions a further workshop was arranged. The workshop used Forum Theatre to illustrate the relationship between catchment landuse and land management practices, soil erosion and sedimentation. At this workshop the participants began to realise that soil erosion measures along the tributary would treat the cause of the flooding at the bridge. Further, participants identified the following issues concerning the management of the flow releases from the Seymour Dam:

- in between releases, water levels were low, leading to poor quality, stagnant water, which is collected directly from the river for domestic use;
- the Hertzog Agricultural Co-operative (HACOP) irrigation scheme, which provides the primary income for the Hertzog and Fairbairn villagers, needed a reliable flow to ensure they could irrigate their crops;
- a lack of communication and negotiations between Kat River Valley inhabitants and water users;
- no management structure representing all catchment stakeholders; and
- community stakeholders do not have a say in decision making.

From this, the participants believed that if there was a water management structure in the Kat River Valley in which they could participate, the community of Fairbairn could have a say in the flow releases

as well as be better informed about flow release decisions made by the Kat River Irrigation Board, DWAF or the TLC. Although the participants still saw a need for a higher bridge they also began to understand the roots of the problems.

Gradually the approach to achieving the aims and objectives of the research was redefined by the participants. They wanted to find a way to become involved in management decisions of the Kat River. This finding was expressed at a workshop with the WRC Steering Committee on the 2nd of December 1997. Participants identified that there was no structure through which consultation and negotiation could take place between the Fairbairn villagers, downstream users and those who managed the Kat River Dam at Seymour (see Map 1-2). At the 2nd of December 1997 workshop a process of negotiation between community participants and the WRC identified that the development of IWRM institutional arrangements under the NWA could enable them to participate in decisions that affected their water resources, such as better flow management and communication between water users in the Kat River Valley.

The outcome of this workshop was a submission through the Geography Department of Rhodes University of a contract research proposal, to WRC, and the subsequent receipt of funding for 1999 and 2000. I was subsequently engaged as Research Officer. The project, named the Kat River Valley Project (KRVP) by participants from Fairbairn and Hertzog, was designed to support the formation of a Catchment Forum (CF) and Water Users Association (WUA) using participatory methods. The KRVP provided a platform that specifically enabled achievement of the following research aims and objectives (see Chapter One):

Aims

- facilitating the application of community knowledge to an applied development outcome; and
- exploration of broader development principles and practices for IWRM.

Objectives

- ensuring the adaptation of participatory research methodologies to the South African context; and
- to use community sensitive and people centred methods that will to the empowerment of the community and allow for applied outcomes.

I will return to the case of the bridge and the outcomes of the capacity building and community activity in Section 9.8 as an example of sustainability resulting from group growth.

9.3 The Shift from the Local to the Catchment Scale

Phase Three of my research journey focussed on my research experiences whilst working as a practitioner on the Kat River Valley Project (KRVP). This project was initiated in late 1998 and was implemented from early 1999 to early 2001. It aimed to enable diverse groups of stakeholders to develop a common vision and form IWRM institutions, namely a WUA and a CF, as envisaged in the NWA. The institutions were identified as a desirable output of the project by the Kat River Valley stakeholders from the upper, middle and lower reaches of the Kat River (See Map 9-1).

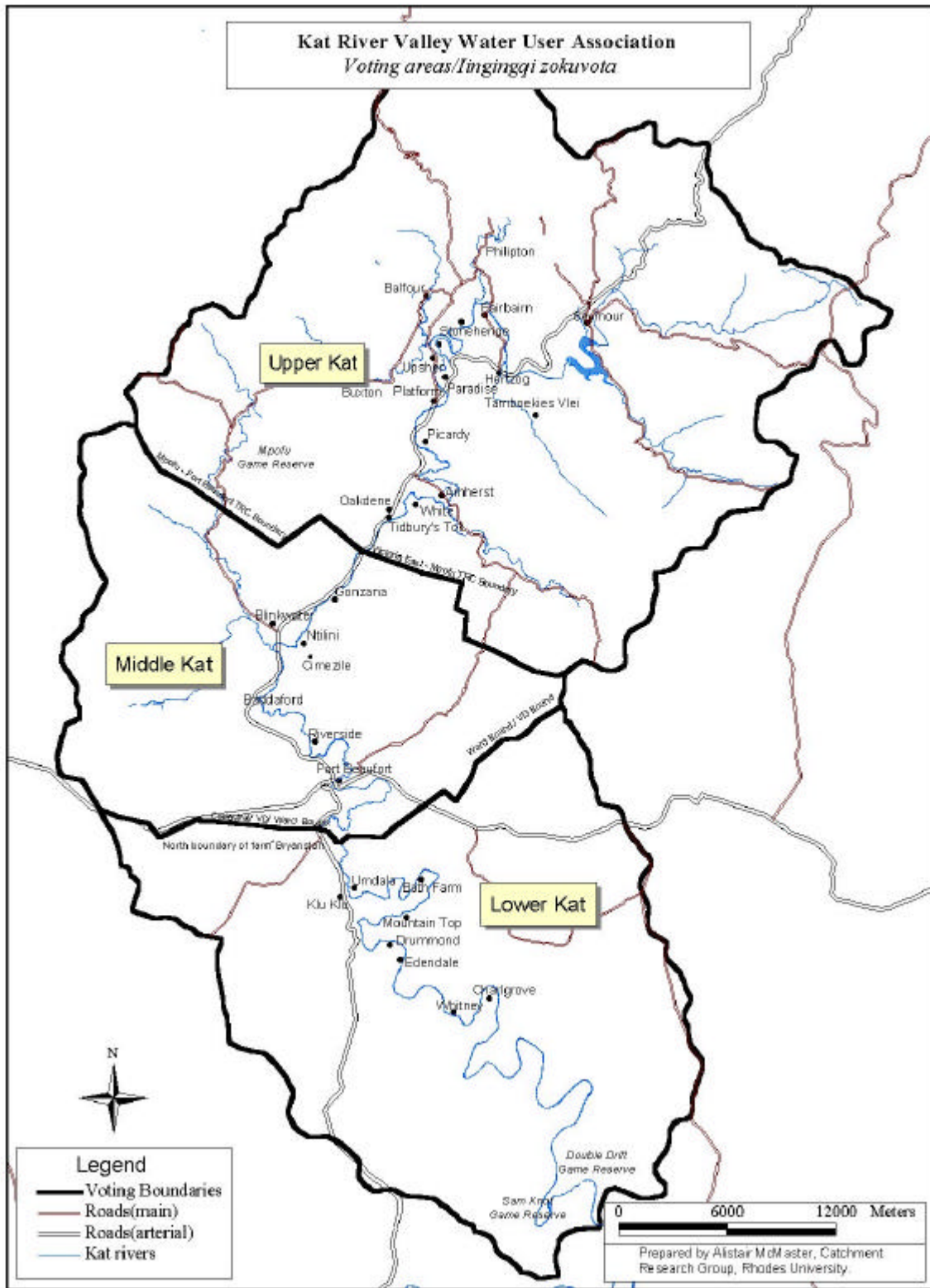
The KRVP acted as a platform for my continuing research, specifically helping me to explore the evolution of people's empowerment as they become increasingly active participants in IWRM, from a focus on individual and village-scale problems to a focus on the catchment-scale. It also enabled the Kat River Valley stakeholders to actively participate in, and benefit from, my research. The following sections are *not* a report on the KRVP (see Motteux, 2001 for the KRVP aims, objectives and findings). Rather, it is a discussion of the methods, activities and results of my ongoing PhD research conducted during the implementation of the KRVP.

The shift away from focusing on the communities of Fairbairn and Hertzog to a catchment-scale project resulted in the following challenges:

- how to build an awareness of IWRM;
- how to find appropriate participatory philosophies and methods with which to involve stakeholders in IWRM planning that would result in shifting more responsibility for IWRM to stakeholders;
- how to develop the skills needed in IWRM problem solving, including working in groups, gathering and analysing information;
- how to clarify actions and design and implement a plan of action; and
- how to link and establish a working relationship between diverse stakeholders.

This resulted in the following three core themes and research questions, framing this research:

- **Priority setting** - How to identify and focus stakeholders' priorities for action?
- **Participation** - How to involve stakeholders in catchment-scale decision making?
- **Independence for sustainability** - How much IWRM activities can marginalised people do for themselves within and after the project?



Map 9-1 : Kat River Valley Water User Association Voting Areas

The research drew on skills from within the Geography Department and from outside to ensure that the work was professional and innovative so that it met the needs of local stakeholders. Some of the different skills needed were GIS, mediation, legal advice, management, administration, communication and writing. Working with outside specialists provided the opportunity for co-learning, something that is integral to participatory development.

One of the principal human resources used in implementation was the team of grassroots facilitators introduced in Chapter One. This group of five local Xhosa actors and facilitators came from Grahamstown and were selected for their skills and previous experience in simultaneous interpretation between Xhosa and English, theatre for development and stakeholder facilitation. I trained and guided them to support the implementation of research activities with community participants at a catchment scale. They, in turn, also taught me a great deal – an important co-learning opportunity and outcome. The team of grassroots facilitators used a range of drama and culturally appropriate communication methods to elicit active participation and assisted with the fieldwork and decision-making.

The community of Fairbairn and Hertzog appointed Jerry Ntsebeza, a Fairbairn resident, to represent them on the research team. He became one of the grassroots facilitators, joining the five other facilitators from Grahamstown. As one of the grassroots facilitators, Molly-Anne Nqweniso (2001), notes:

The people at a planning workshop noted that it was vital to employ someone local so that they are given constant feedback to guide and have a meaningful say in the project and in this way to ensure that their needs were met. The community nominated 5 people so as to choose between them who should have the job opportunity that opened for that person. People went to an interview, we decided that there must be interviewers from the community so as to choose the right person, that they feel was good for the job, three ladies and one man were being interviewed. Jerry was the interviewers' choice.

9.4 Research Questions and Activities Associated with the KRVP

One of the stated objectives of the research was the involvement of local stakeholders in the establishment of their WUA and CF. In Section 9.4 I outline the activities leading to formation of the Kat River Valley WUA and CF to provide background for the detailed examples used to answer the three core research questions of Phase Three that are presented in Sections 9.5, 9.6 and 9.7 respectively. Section 9.4 covers the following contextual issues: establishment of the WUA, establishment of the CF and activities associated with each research question.

9.4.1 Establishing a Water User Association in the Kat River Valley

Members of the Kat River Irrigation Board, who were predominantly ‘white’ commercial farmers, recognised that the NWA required the irrigation board to be transformed into a WUA. The transformation process required that a constitution needed to be drawn up in a manner to ensure the representation of all water users and potential water users in the Kat River Valley, namely on the grounds of gender, racial groups and different sector enterprises. A water user is defined in the NWA as any institution, entity or individual that has an entitlement to use water (RSA, 1998). This also entitles the user to become a member of the WUA. Entitled users in the Kat River Valley included local government as well as large and small irrigators. However, in the Kat River Valley entitled users acknowledged that domestic users who collected their drinking water from the river should be recognised in the WUA constitution. The WUA constitution needed the stakeholders to agree and record the name, objectives and the area of operation, principle and ancillary functions, founding members, entitlement to membership, rights of members, system for nominating and voting for members for the management committee, appointment of employees, raising of loans, annual report and winding up (Audie, 1999). The diverse Kat River Valley stakeholders formally initiated the process of forming the WUA in October 1999. The Minister of Water Affairs ratified the WUA in December 2001.

9.4.2 Establishing the Kat River Catchment Forum

The NWA provides for the establishment of committees under section 82 (5) but CF are not specifically defined or formalised in the NWA (Mbokota, 2001). The fundamental difference between the WUA and CF is that the WUA is primarily concerned with the management of water whereas the CF is about broader catchment management issues. CF, unlike WUA, are not statutory bodies. A CF is able to enter into contractual or delegatory relationships with DWAF and the relevant Catchment Management Agency (CMA) – the largest-scale water resource management institution defined under the NWA - or exist in their own right (Mbokota, 2001). For instance a CF could form a Section 21 Company; a Charter; an Agreement/Contract of Association; or even develop a Constitution for the forum's role, functioning and operation.

The need for a Kat River Catchment Forum was identified in a catchment survey conducted by community participants during June 1999 and at environmental awareness workshops conducted during March 2000 with participants from 15 marginalised communities. However, the Kat River Valley CF as it is currently constituted does not have formal status - it is not a Section 21 company and does not hold delegated powers, either from the CMA or from DWAF. It is an informal grouping of people with a common interest in IWRM that intends to support the catchment management activities of the Kat River WUA.

9.4.3 Activities Associated with Research Questions

As detailed in Section 9.1, three research questions were developed to guide the action research for Phase Three. They were designed to help me observe, and learn lessons from, the KRVP activities that were designed to enable stakeholders to participate, take ownership, and build their capacity in the development of the WUA, CF and IWRM concerns.

In the research I examined if the stakeholders gained sufficient capacity to be able to operate independently so that the IWRM initiatives could survive beyond the research period and project funding. This question was borne in mind from the very beginning of the project: that I would, inevitably, leave the project and, because of this, the work must have sustainability as one goal. The activities that were used to implement these research questions drew on the philosophy of IWRM and participatory research.

As noted in Table 9-1 the answering of a research question draws on multiple methods and activities through time. With each activity an approach was planned, methods employed, analysed and reflected on. Reflection played a key role in the research to ensure that the research questions were being addressed. The focus on this section is not on the reporting of quantitative results, but on interpreting qualitative change brought by every activity in meeting the research questions. However, no one method or activity dealt with the multiplicity of contexts, diversity of stakeholders and the number of stakeholders. Some activities provided short-term functions, others provided more long-term results, and some activities contributed to answering one or more of the listed research questions.

9.5 Priority Setting - How to Identify and Focus Stakeholders' Priorities

The first research question explored in this chapter seeks to understand how to identify the priorities that stakeholders have for IWRM, and how to focus them to make efficient use of limited research resources. This question was developed as a result of the findings of the research from 1996 to 1998 in which it was found important that the research engages stakeholders to identify their common needs and also for stakeholders to collaboratively identify their priority needs. This was difficult because during apartheid and the post-apartheid period there was a failure of different racial groups and governmental stakeholders to engage and decide on a common need. This task was further complicated by the fact that the marginalised stakeholders in the catchment had not been involved in a process that required them to voice their needs and identify priority needs in a formal meeting with diverse stakeholders. Therefore, the research needed to find ways in which to bring diverse stakeholders together to have a voice in matters affecting them and for them to investigate their needs – and the environment's needs – within a social setting – and within the resources of the research budget. In this, it was important for stakeholders to consider the importance of the sustainability of their actions on IWRM.

Table 9-1 : Activities Used to Address Phase Three Research Questions

Actions	Priority setting - How to identify & focus stakeholders' priorities?	Participation - How to involve stakeholders at catchment-scale?	Independence for Sustainability - How much can marginalised people do for themselves?
Stakeholders input in the project development.	✓	✓	✓
Employed grassroots facilitator team	✓	✓	✓
Developed skills in grassroots team	✓	✓	✓
Planning of activities	✓	✓	✓
Social survey of catchment communities & their resource use	✓	✓	✓
Visited catchment stakeholders in 15 participating communities, DWAF, local government & commercial farms	✓	✓	
Developed & circulated newsletter		✓	
Developed & circulated brochure		✓	
Monitoring & reflection of activities	✓	✓	✓
Networked with national stakeholders & shared learning	✓		✓
Stakeholders workshop	✓	✓	✓
Build capacity of Rhodes University students	✓	✓	✓
Conduct 9 environmental awareness workshops with 15 communities	✓	✓	✓
Develop booklets to detail results of the environmental awareness workshops		✓	
Entry for the Nedbank/ Mail & Guardian Green Trust Awards 2000		✓	✓
Providing information about NWA institutional arrangements to participants	✓	✓	✓
Conduct 15 way forward workshops in each participating community to elect CF representatives	✓	✓	✓
Bus trip through the valley & mapping exercise with elected CF representatives	✓	✓	✓
Conduct action planning workshop with CF representatives and WUA Steering Committee	✓	✓	
Construction of low-level bridge	✓	✓	✓
Establishment of Catchment Forum	✓	✓	
Establishment of Water Users Association	✓	✓	✓

It was also important that the process of identifying needs included the educated and wealthy socio-economic stakeholder groups, as they too have needs in IWRM that affect their livelihoods, their well-being and their empowerment.

In this section I use the first catchment-based workshop of diverse stakeholders to demonstrate the methods, activities, results and reflections of enabling stakeholders to identify their priority needs. The Stakeholder Workshop took place in October 1999 at the Mpopu Training Centre in the Kat River Valley (See Appendix 4 Box 2 for the details of the program). This workshop set out to determine the underlying needs of the diverse stakeholder groups in relation to IWRM. Participants invited to the Stakeholders' Workshop held in October 1999 were representatives from the rural communities, representatives from the commercial farming community and the Kat River Citrus Co-operative (Katco), and local and national DWAF representatives. Two outside facilitators agreed to facilitate the workshop. The output from this workshop included a priority action to establish a WUA – something that participants eventually achieved in May 2002.

Other community needs outputs from the workshop which were acted upon over the following two years included:

- identification of the need for capacity building in IWRM;
- developing a better understanding of catchment processes and their management;
- local economic development including marketing support and irrigation water for emerging farmers; and
- environmental management systems for exporters of citrus fruit.

9.5.1 Preparing for the Stakeholders' Workshop

Preparing for the stakeholders' workshop required me to contact and invite a diverse range of stakeholders including DWAF staff and commercial farmers. During the preparatory phase I also used a suite of methods that were appropriate to build the capacity of participants so that they would have the necessary skills and knowledge to articulate their perceived threats, opportunities and priorities at the stakeholders' workshop. The methods and activities chosen took into account the research budget, logistics, as well as stakeholders' education, knowledge in IWRM matters and exposure to round table discussions.

Participation of DWAF stakeholders was encouraged from the start of the research. To do this I held telephone conversations with key DWAF stakeholders, attended presentations, obtained current DWAF documents, and involved DWAF staff in the Stakeholder Workshops.

The team of grassroots facilitators and I implemented capacity building of community participants. We visited stakeholders to listen to their needs, stories, reflections and hopes prior to the stakeholder workshop. Approaches I undertook to prepare stakeholders for the stakeholder workshop in October 1999 fell into two categories.

The first approach concerned stakeholders who were familiar with round table discussions. I contacted these stakeholders by phone and also visited them prior to the workshop to ensure that they were happy with the workshop agenda as well as to listen and answer any concerns. I also provided them with a typed list of definitions and meanings of IWRM concepts and made available copies of the draft constitution for transforming irrigation boards into WUA (Audie, 1999) in central locations, such as Fort Beaufort library, TLC and TRC offices.

The second approach I used catered for stakeholders who had not been involved in such round table negotiations with diverse stakeholders. Prior to the workshop, discussions were held with these stakeholder groups to understand and identify a plan that would provide them with the necessary support. For example, prior to the stakeholder workshop the need to hold a preparatory workshop with Fairbairn and Hertzog community participants was identified as important to enable them to understand and internalise IWRM concepts, build trust in themselves, identify strategies to deal with new or concerning situations such as overcoming language barriers, and encourage stakeholders to take responsibility.

Invitations for this workshop were translated into Xhosa and were sent out to residents of Fairbairn and Hertzog with the grassroots facilitators and community volunteer going door to door informing people of the workshop to be held in Fairbairn.

The preparatory workshop was held in March 1999 with the Fairbairn and Hertzog community. The IWRM concept was outlined using forum theatre. The forum theatre featured Molly-Anne Nqweniso, a grassroots facilitator, who played the role of a new researcher with no knowledge of the Kat River Valley. Using role-play, Molly-Anne Nqweniso, was travelling through the catchment to gain information to lay the basis for the catchment-scale water resource research. As she travelled, she asked the participants of the workshop questions about each community and in doing so drew a map of the area. The forum theatre was followed by discussions.

Using the map that was drawn through the forum theatre, the grassroots facilitator and I explained that to establish a water management institutional structure, as envisaged in the NWA, all these communities depicted on the map needed to become involved and participate in the research process.

At this preparatory workshop a second forum theatre was used. The forum theatre involved the participants naming the community groups along the river. As the participants named the community groups they were grouped to take on the roles and identities of these community groups in the Kat River Valley. As shown in Plate 9-1, these stakeholder groups were positioned according to their location in the Kat River Valley. A blue cloth representing the Kat River was placed in the middle of these groups.

Molly-Anne Nqweniso opened the forum theatre by saying “You know my Xhosa language is so bad. I am good in English, I just speak a little Xhosa”. This resulted in a translator being selected from the participants. It also resulted in each group selecting a person who could communicate in English – something that was essential for the stakeholders workshop where English was to be main the language.

To enable the different groups to form an identity we asked them to discuss their water situation for domestic and farming use specific to that group. In order to stimulate discussion in the different stakeholder groups, Molly-Anne Nqweniso acted out a scene that showed selective water releases from the Kat Dam for use by downstream commercial citrus growers, and the impact of these releases on HACOP farmers with little capacity to store their water. The actress spoke mostly in English.



Plate 9-1: Fairbairn Participants Represent Kat River Valley Stakeholder Groups

This scene resulted in the participants who were representing the upstream marginalised groups expressing frustration at their desperate water problem. They complained of having stagnant water, children falling sick and failing crops. Tension arose until the participants decided to arrange to come together and negotiated fairer water releases, as shown in Plate 9-2. Still in role-play the participants introduced themselves, then presented their concerns and strengths. Molly-Anne and I acted as the facilitators of the hypothetical workshop.

Once agreement and understanding of the different stakeholder positions were understood, a ball of string was passed from each individual to all of the others until each person held onto a section of the string. The ball of string was extended to Molly-Anne Nqweniso and me to exhibit that the partnership would also involve stakeholders from outside the catchment, such as DWAF. With everybody holding

the string it gave a clear demonstration that IWRM requires participation and partnerships between all stakeholders. The string further demonstrated that as one or two participants let go of the string the partnership was weakened – something that a participant reflected on in the following statement:

That string is not tight because the old man has let it off and so he is not holding the string. We do not sit together any more. It is better for all of us to hold the string.



Plate 9-2 : Participants Come Together to Negotiate

The actress speaking English in the forum theatre resulted in participants understanding and recognising the importance for representatives to understand IWRM concepts, be able to negotiate, communicate in English and have an interest in ensuring desired outcomes. The preparatory workshop enabled participants to discover and reflect on strategies to overcome language barriers and fears of talking in public. However, this preparatory workshop did not list or determine a set strategy for the participants but encouraged them consider carefully the skills required to enable them to participate in the catchment-based workshop.

I also used round-table discussions and focus group meetings with the 13 other marginalised catchment communities to introduce them to the concepts that would be used and discussed at the Stakeholders' Workshop. They were issued with invitations to the workshop and asked to select representatives to participate in the workshop. One of the grassroots facilitators conducted follow-up visits with each community to ensure that they were ready to participate in the Stakeholders' Workshop.

The need for the community representatives participating in the Stakeholders' Workshop to have a range of skills and understanding resulted in some communities identifying more than one representative. This

was a support mechanism that ensured that the issues, knowledge and decisions at the Stakeholders' Workshop could be discussed in a group. In these groups the skill base was broad, with some of their representatives having leadership abilities, language skills and an interest in IWRM. This was in contrast to stakeholder groups with experience in such workshops who selected only one representative for the two broad farming areas.

The capacity building process resulted in the diverse stakeholders understanding how their knowledge, skills and self-confidence shaped their ability to articulate their ability to effectively articulate their priority needs at the Stakeholders Workshop. The marginalised stakeholder groups were able to identify and recognise that changing the water management structure required them to work with diverse stakeholders from the Kat River Valley. The use of forum theatre and round-table discussions also enabled participants to explore how wider social structures, such as political and economic processes, had excluded them from skills and resources that were necessary in participating in IWRM. Therefore, mindful of constraints such as language and literacy they became committed to finding appropriate strategies that would minimise the extent to which these constraints would prevent them from meaningfully participating to the WUA, CF and other IWRM processes.

This resulted in some of the following strategies being applied: identifying skilled community representatives to attend the catchment meetings; ensuring representatives reported back in detail to the communities to share knowledge with all interested community people; literate community members reading documents out aloud to interested community people; representatives attending all meetings; ensuring transport was available for them to get to the village and catchment based workshops; understanding all relevant IWRM concepts prior to the workshops and; familiarisation with all documents and report of the workshops.

I found that the participatory approach adopted at the start of the research with the diverse stakeholders in Phase Three enabled a respectful, open dialogue and negotiation between the participating stakeholders, the team of grassroots facilitators and me. The discussions enabled the exploration of complex issues concerning the research - such as roles and responsibilities, visions and approaches. This effective communication was essential to build a collaborative relationship that ensured that stakeholders, the grassroots facilitators and I had a common understanding and were all aiming for the same goals. It also prevented misunderstandings and conflicts in the long-term concerning the aims and resources of the research and ensured the research was built on clearly understood roles and responsibilities.

9.5.2 Implementation of the Stakeholders' Workshop

To identify the priority needs of the diverse stakeholders, I acknowledged that I needed the support of outside facilitators who had the experience and knowledge of dealing with negotiation and conflict as well as a good understanding of the NWA. Two outside facilitators agreed to support the research process – Dr Ralph Heath from Rand Water and John Fargher from AACM International in Australia.

Prior to the workshop the outside facilitators, the team of grassroots facilitators and myself met to ensure that we had a plan and had a good grasp of the terms and concepts of IWRM as well as an understanding of our roles and responsibilities.

At the Stakeholders' Workshop the outside facilitators, the team of grassroots facilitators and I drew on suite of participatory methods including brainstorming, open probing and closed questions, small group dynamic focus groups, dialogue and mental mapping to identify overlapping needs, negotiation and conflict resolution, drama and reflection (see Chapter Four). These methods were used to analyse the situation, identify and prioritise issues and identify opportunities for establishing a WUA. The methods used at the stakeholders workshop included: active and passive listening; listening to understand; guiding stakeholders to understand and engage in actively managing their threats; opportunities and priorities for IWRM action; asking constructive questions that separate content from feelings; asking questions to expand knowledge; motivating people to share ideas; screening out distractions; being open, interested and attentive; bringing out new ideas; providing continual feedback; confronting problems and managing the conflict; writing concise and understandable lists of the identified needs in order for the stakeholders to vote on their priority needs; and continuously encouraging active participation.

At this workshop the activities had DWAF sitting with other stakeholders and participating in the same activities as stakeholders from catchment communities. This was done to help community stakeholders understand that IWRM is not solely DWAF's concern but one in which all stakeholders analyse, plan and act on concerns and opportunities together. In this way they came to see DWAF as a stakeholder, like themselves. However, at this workshop the DWAF representatives' roles, knowledge and skills were acknowledged and often were asked by stakeholders or me to clarify issues, such as the relationship between the WUA and CF.

The stakeholders - rural villagers, commercial farmers and DWAF representatives - were given the same status. At the beginning of the workshop, these groups introduced themselves. Using small-group dynamic methods (Fargher, 1991) participants, including DWAF were asked to form focus groups and to identify the threats and opportunities of importance to them in the Kat River Valley. The purpose of this activity was to identify the perceptions of participants of the potential areas of IWRM concerns in the

Kat River Valley, including economic, social and environmental values. These perceptions were used to enable participants' to identify costs and benefits of IWRM in the local catchment, which led them to identify a common vision.

In response to questions posed by the facilitators, each member of the group wrote their individual contributions of threats and opportunities on to Post-It ® notes. The facilitators made use of a range of questions to achieve this, such as open, probing, and closed questions. The facilitation process enabled each participant to expand on their topics and explore further issues. Once this was done, the participants, with the help of the facilitators, grouped the perceived opportunities and threats into clustered groups.

Each team then nominated a spokesperson to present their small group findings to the broader workshop. Thereafter, a voting system was used to list the issues that the participants believed to be the most pressing. Plate 9-3 shows a participant voting to identify and rank his priority needs. This list was summarised to reflect only what participants had said. No 'editorial comment' or judgment was given. Summaries were generated after listening to responses in full, without interruption. With the help of negotiation tools participants decided how to prioritise the issues, which led to an acknowledgment that there was a need to understand the process of setting up a WUA. This established the participants' positions clearly.

The stakeholder workshop was the first time that some stakeholders had met each other. It was certainly the first time that stakeholders of the Kat River Valley were represented in one place. By giving DWAF and Kat River Valley stakeholders the same status as participants in the workshop, community and commercial farming stakeholders had the opportunity to say what they perceived and how they felt about riverine and water resource management issues. It also enabled them to interact, learn and play an active role in identifying and prioritising their needs.



Plate 9-3 : Participant Voting to Identify and Rank his Priority Needs

The diverse stakeholders identified many catchment opportunities and threats in the stakeholder workshop. These opportunities and threats were identified and documented into a report for all participating stakeholders (See Appendix 4 Box 2 for stakeholders' workshop report). Key opportunities and threats that were identified by the participating stakeholders were:

- pollution such as litter, washing clothes next to the river or the lack of proper ablution facilities along the river;
- dumping of unmarketable oranges into the main channel;
- soil erosion;
- lack of communication amongst and between stakeholder groups;
- lack of information regarding flow regulations; and
- overgrazing that causes soil degradation.

Key opportunities identified were:

- sustainable citrus industry;

- meeting standards for certification of environmental management systems for citrus farms and packing sheds to ISO14001, and work towards organic certification of export citrus orchards;
- high quality citrus production resulting in economic growth and employment;
- firm commitment to establish a catchment forum in Kat River Valley;
- enthusiasm among stakeholders and commitment to fix local and catchment issues; and
- CF is supported in the NWA.

The lists of opportunities and core threats demonstrate a mix of immediate local needs and longer-term catchment-scale and environmental needs. Importantly, there was recognition by marginalised community participants and commercial farmers that they perceived many common opportunities – for example a sustainable citrus industry, the need to access export markets through ISO14001 accreditation and high quality citrus production for economic growth and employment. In addition, the perceived threats and opportunities demonstrated a shift in awareness and priorities away from an anthropocentric towards an eco-centric ecological paradigm (see Chapter Three). With the help of negotiation and conflict resolution facilitation, participants used a simple voting method to rank their identified needs in order of priority. This led to an acknowledgment of the need to understand the process of setting up a WUA. This highlighted the importance of supporting CF activities as an integral component of the process for forming a WUA. It was also decided that the WUA would support catchment management functions – something that the NWA leaves to the discretion of the WUA members.

At the Stakeholders' Workshop held in October 1999 participants identified the need to understand and debate the draft WUA constitution with the help of the outside facilitators. The task was to mould the pro forma WUA constitution developed by DWAF under the NWA to reflect the diverse needs and context of the Kat River Valley and its stakeholders. This process involved the outside facilitators discussing each component of the constitution in detail to ensure all stakeholders had the opportunity to understand and ask question, and contribute their ideas. Each component of the constitution was covered in turn (see Motteux and McMaster, 2001). This included the name, objectives and the area of operation of the WUA. Some areas required negotiations to achieve consensus. Once the stakeholders reached consensus the outside facilitators verified the participant's statement by summarising what was said, without any editorial comment. This activity was undertaken with the knowledge that the product would be the first draft of the WUA constitution. Changes to the constitution could be made in the future.

In the process of capturing the needs of participating stakeholders, discussions in the workshop reached the contentious subject of the voting allocations to various water users to elect members of the WUA. The outside facilitators used negotiation to deal with the difficult and highly politicised issue of working

out the ratio of water allocation between large-scale irrigators who are a minority stakeholder group and the small-scale irrigators who are a majority stakeholder group in the catchment. The large users of water (the commercial irrigators) were hesitant to continue with the negotiations for fear of losing water allocation. In this case the outside facilitators actively encouraged the large irrigators to reconsider their positions by offering a platform upon which the issues could be aired. The facilitators stated that it was unwise to stop a negotiation.

Therefore, the facilitators enabled the large irrigators to return to the information stage and allowed time for all participants to reflect on the tradeoffs between regional economic activity, righting historical wrongs and working towards equity that define the problem. The facilitators also encouraged participants to actively investigate the options and to be clear about the consequences of failing to reach a negotiated solution, and/or to bring in a third party to act as a mediator. This required facilitators to be aware and able to overcome deadlocks of participants having divergent objectives in a situation where relationships had traditionally been embedded in misunderstanding.

The negotiation process allowed the participants at the stakeholder workshop to reach an agreement in which commercial irrigators were accorded 60% of the votes and domestic users 40%. This split was recognised as appropriate since large irrigators are proportionately the heaviest investors in, and funders of, the water supply system and IWRM activities. That said, it was also agreed that domestic water users reliant on river water should not be dominated or compromised by the actions or needs of the irrigators. This is a resolution that remained central to activities leading to the formal establishment of the WUA and its constitution, including formal endorsement by the Minister of Water Affairs in December 2001.

The negotiation and conflict resolution processes used at the workshop acknowledged the need to set up a support program to inform marginalised groups of the WUA and the development of its constitution to ensure participation. The outcomes of the negotiations were to:

- translate the draft WUA constitution into Xhosa; and
- run environmental awareness workshops with marginalised groups of stakeholders to build their understanding of water management, identify their needs and to invite them to participate in the process to transform the Kat River Irrigation Board into a WUA. This was carried out in nine environmental awareness workshops that included 15 rural communities.

Reaching consensus amongst all participants that the priority need was to create institutional structures, such as WUA and CF, made the purpose of the research clear and enabled stakeholders to focus on this goal. During discussions of how to translate the stakeholders' goals into action they became aware that this task required their active participation with the help of the research team. This resulted in them

recognising the shift from being told what to do by outsiders to becoming actively involved in decision making, problem solving and committing to actions. This resulted in participants discussing how to effectively collaborate with the research team to make best use of their time, ability, skills and specific knowledge to achieve the long-term goal of establishing a WUA. Focussing on this also resulted in stakeholders deciding whether or not they had time, resources and the desire to continue participating in the activities.

Through interactive discussions at the stakeholder workshop the participating stakeholders identified the need to elect a representative Steering Committee to drive and guide the development of the WUA constitution. The stakeholders also recognised the need for this steering committee to ensure that the process was transparent, accountable and representative – consistent with the priorities they had set together. The participating stakeholders elected four representatives - a representative each for the lower and mid Kat River and two from the upper Kat River Valley. The stakeholders elected a WUA steering committee to oversee the processes leading up to establishment of the WUA. They saw the tasks of the WUA steering committee as working with the research team to arrange meetings, set agendas, hold catchment based workshops to enable stakeholders to have a voice in the development of the WUA constitution, review relevant IWRM documents and the WUA constitution, keep stakeholders informed of decisions, liaise with DWAF and ensure amendments requested by DWAF in the review period were appropriate to the Kat River Valley and suitably incorporated.

The clear roles of the WUA Steering Committee enabled them to foster cooperative relationships to overcome the difficulty of translating the identified stakeholders' needs into a defined goal with a coherent action plan. For example, the WUA Steering Committee benefited from the support of their communities in carrying out tasks and dealing with uncertainties. The support given to the WUA Steering Committee by their communities ranged from handing out invitations for the subsequent environmental awareness workshops, to talking through IWRM concepts, reading through documents together, providing transport, acting as sounding boards to fully consider all sides of an issue and how to anticipate a broad range of possibilities.

As in other catchment and village scale workshops, the Stakeholders Workshop used a suite of participatory methods to build participant capacity, plan and implement activities and reflect on what was being done. Selected examples of methods have been presented above, including drama, focus groups using small group dynamics, priority ranking and group discussions. The participatory methods used resulted in stakeholders and team members getting to know each other and building a working relationship that appreciated diversity of culture, resources and needs. Further, the participatory methods used resulted in DWAF stakeholders and Kat River stakeholders developing a relationship and engaging

in dialogue based on a thorough understanding of needs and concerns. DWAF was able to understand how they could support priority concerns of the Kat River Valley stakeholders, grassroots facilitators and me, such as providing advice, current documents and contact people who could fulfil expert functions. Their advice was invaluable as IWRM was still being debated and developed at a national level. It was, therefore, important for the Kat River Valley stakeholders, grassroots facilitators and me to have access to, and an understanding of, the developments in IWRM. The advice and documents provided by DWAF stakeholders were reflected on and dialogued with Kat River Valley stakeholders through the process of forming the WUA to ensure the research was on the right path.

The result of the DWAF staff participating as stakeholders in catchment workshops run by outside facilitators was resolution of the conflict of interest that exists if DWAF staff facilitate a catchment workshop in which they are also a stakeholder. Having outside facilitators facilitating the meeting enabled DWAF to participant equally in the workshop and to be able to express their hopes, needs and concerns. It also helped the grassroots stakeholders to acknowledge the role and skills of the DWAF stakeholder and begin to break away from the concept of DWAF representatives having all the answers and resources to implement actions. Instead, together, all stakeholders began to develop a concept of partnership by analysing and seeking solutions together and were able to consider their strengths, weakness and roles in activities.

9.5.3 Reflections on the Stakeholder Workshop

The stakeholder workshop enabled stakeholders to develop a good understanding of the research goal that enabled them to commit to addressing the identified need. This clarity of the priority goal (that is establishment of a WUA that represented all water users and potential water users in the catchment) enabled stakeholders and the team working on this research to negotiate, allocate roles, learn to collaborate on working through unclear situations, expand thinking skills to consider all sides of an issue, set out clear procedures and put them into action in a manner that was open to improvement, enjoyed innovation as well as appreciated flexibility.

The allocation of roles and tasks amongst the WUA steering committee, the grassroots facilitators and me gave a good sense of the role of each party. Clarity of roles ensured that there was no duplication and avoided potential conflict. In fact, it helped to encourage a more flexible approach that in turn established good working relationships, amongst all stakeholders as well as providing support for them. Participatory approaches that focus on dialogue help diverse stakeholders and facilitators to analyse situations and make decisions that are clear to all groups involved and prevent future conflict.

On reflection, using participatory approaches and the concept of overlapping needs explained in Chapter Four (see Figure 4-2) to match the Kat River Valley stakeholders and DWAFs' needs provided the basis for a long-term relationship between these stakeholder groups. Within Action Research, the aims and objectives needed to unfold in relationship to the local needs. This encouraged all stakeholders to engage in and own the research. Therefore, I found that stakeholders became a part of the process when they directed the aims and objectives through a process of reflection, group negotiation and co-learning.

The outside facilitators enabled the diverse stakeholders to meet, discuss partnerships and allocate responsibilities for bringing about change as well as explore areas of support. For example, the outside facilitators enabled open communication between DWAF and the Kat River Valley stakeholders. This meant that questions could be asked, learning could occur, and debate could take place to ensure that the planned actions were heading towards the agreed goal and any gaps were filled. I found that the workshop provided a structured environment to negotiate common agreements with the help of skilled and knowledgeable outside facilitators. These facilitators were important in helping the diverse stakeholders to work towards setting priority goals, objectives and actions.

9.5.4 Follow-Up from the Stakeholders' Workshop

The stakeholders' workshop was followed up with activities that were concerned with the involvement of the diverse stakeholders in the transformation of the Kat River Irrigation Board into a representative WUA for water users and potential water users in the Kat River Valley. This transformation process necessitated the negotiation and development of a WUA constitution that would meet the Kat River Valley and DWAF stakeholders' needs and result in the fair and sustainable WUA. The follow-up activities were three additional catchment-based workshops, held on the 7 November 1999, 23 November 1999 and the 12 July 2000. These were implemented to ensure that all stakeholders had the opportunity to be involved and participate in the formation of the WUA – in particular to contribute to the purpose, vision and activities of the WUA. Transport was provided to enable stakeholder participation in the workshops. These workshops were held at the Mpofu Training Centre because it was an accessible and non-threatening venue that ensured stakeholders could participate.

The same catchment stakeholders participated in three catchment-based workshops. They were concerned with ensuring that the WUA constitution met the needs of the stakeholders whilst also fulfilling the requirements laid out by the Government of South Africa (DWAF, 1999) namely that:

- the constitution must be legally sound;

- the constitution must be developed through a consultation process that included the diverse stakeholders in the area of operation; and
- the constitution must propose an organisational structure that is representative, achievable and functional.

Drama was used at the start of each of these workshops as an icebreaker and also to focus the stakeholders on the task of jointly developing a representative WUA. Each workshop drama performance drew on the same background story: the change of water management from a technical focus (for example building infrastructure such as dams and canals that benefited a few groups) to a participatory focus (for example stakeholders working together to manage the water resource sustainably). With each workshop the dramas drew on this background story as well as incorporating concerns that had been raised by stakeholders at preceding workshops. An example was how to delineate the voting areas. This was done to ensure that stakeholders' concerns were addressed in a non-threatening manner and that issues were not ignored.

The elected WUA Steering Committee, the team of grassroots facilitators and I administered the workshops. The planning and setting of the agenda for the next workshop took place at the end of each workshop. The participating stakeholders, the WUA steering committee, the grassroots facilitators and I did this.

To ensure accountability at each of the three catchment-based workshops, activities associated with the Kat River WUA constitution that had been undertaken since the last workshop were reported back to all participants. In addition, concerns and solutions realised from the previous workshops were reiterated to ensure that all participants could recall developments as well as add to them. The WUA committee made it clear that they were happy to read out or explain any concepts in the WUA to ensure that everyone had the same understanding. All statements were said in both English and Xhosa and minutes of the workshop were recorded and were made available to all participating stakeholders.

At the Stakeholders' Workshop held in October 1999 it had been decided that large-scale irrigators would be accorded 60% of the votes and small-scale irrigators 40% of the votes. These votes meant that large irrigators would have representation equivalent to 60% on the management committee of the WUA and small-scale irrigators would have 40%. The activities of the catchment-based workshops were primarily concerned with finalising the WUA constitution and dividing the WUA catchment area to reflect the agreed proportional voting system. The activity required dividing the area which the WUA

would manage in such a way that each group of water users was fairly represented. It also took into account distances because many stakeholders do not have transport. This meant that if the voting area was too large they would not be able to communicate concerns to their elected WUA member, nor would they be able to attend meetings convened by their representative.

Activities to agree on how to delineate the WUA voting areas uncovered fear and conflict concerning water allocations among some local stakeholders and a fervent need to protect existing water rights or, in others, to gain legal access to water. Given the scarcity of water, and the stakeholders' dependence on water, these issues were pivotal. Even though the water allocation activity was not related to the delineation of voting areas, however, I felt that if the matter was not dealt with the conflict could potentially stall the process. Therefore, I approached Dr. Tally Palmer from the Institute of Water Research (IWR) who volunteered to present options for consensus water allocation and likely consequences if the local stakeholders could not find agreement concerning water allocations. In addition, Dr. Palmer, took the role as a third party mediator and attended the subsequent workshops that set up to negotiate the demarcation of WUA voting boundaries. The delineation of voting boundaries required the stakeholders to analyse the needs of different water users, and with this knowledge sub-divide the Kat River Valley using appropriate boundaries that fairly represented both large and small irrigators as well as other potential water users. This activity required the stakeholders to examine each other's underlying motivations and goals in a direct and interactive way. From this, stakeholders took an active role in sketching possible voting boundaries whilst ensuring that large and small irrigators would be represented.

The establishment of the voting system involved much discussion and review until the local water users were assured that they would be represented appropriately. The negotiation process elicited the following concerns:

- the areas needed to cluster the different water users (i.e., small and large irrigators) spatially;
- the need for there to be one set of rules for all members of the WUA;
- communication and transport need to be taken into account as certain members would find it difficult to obtain information and to travel to meetings if the sub areas were too big; and
- queries were raised whether small irrigators would be placed under the same voting area as HACOP.

These concerns resulted in continued negotiations between the stakeholders, mediator, legal advisers and the team until the root of the problems were understood. It was agreed at the catchment-based workshop held on 23 November 1999 that:

- Domestic water users who abstract water from the Kat River were not entitled to become a member of the WUA Management Committee (MC) because they do not significantly impact on the water resource. However, the participating stakeholders felt that because this group is directly impacted by the quality and quantity of the Kat River Water supply they must have a voice on the management of the water. As a result of this, the domestic users who abstract water directly from the Kat River were invited to have a representative on the Management Committee.
- Local government, which is the water service provider for Fort Beaufort and Seymour, would nominate a member from local government to sit on the WUA Management Committee.
- In the process of negotiation with stakeholders no definition of a large or small irrigator had been outlined. Therefore, some stakeholders did not know which group they fell into and so were unable to establish if they were being represented or not. The negotiations that followed resulted in stakeholders deciding that a small-scale irrigator is someone irrigating up to and including five hectares and a large scale irrigator is someone irrigating more than five hectares. From this definition stakeholder groups could then map and know if they were being represented according to the previously agreed 40:60 split between small and large irrigators.

Uncovering these basic problems and working through them led to the stakeholders using mental mapping methods to prepare a sketch-map that they all agreed was representative and met their needs. The sketch-map represented consensus on key issues such as ensuring the areas were small enough that stakeholders could get to meetings and establishing if each user group was fairly represented. The map that was decided on divided the area into three voting areas, namely lower, mid and upper Kat. Each of the three voting areas would have one large and small irrigator on the MC and one representative of domestic water users. There would also be an elected local government representative on the management committee. This resulted in the change of votes of 60% (large scale irrigators) and 40% (small scale irrigators) to 43% (large scale irrigators), 43% (small-scale irrigators) and 14% (service providers such as Local Government). Alistair McMaster, a Masters student from Rhodes University, digitised the map produced by workshop participants into a GIS that enabled stakeholders to make the final modifications to the boundaries (See Map 9-1).

The steps described in above did not always occur in an orderly linear fashion. At the start of formation of the WUA some stakeholders were busy with harvesting crops and others were coping with the numerous national changes to water policy. Stakeholders found it difficult to cope with the open-ended nature of the research. It was initially anticipated that there would be one workshop after the Stakeholders Workshop, at which stakeholders would comment on the draft constitution. However, the need to ensure that the WUA process actively involved stakeholders in the decision-making resulted in a

process with a defined goal but no certainty about when exactly the activity would end. This resulted in some stakeholders feeling frustrated and resenting the needs of those marginalised stakeholders who required more knowledge and the need to consult with their respective communities. However, with time these frustrated stakeholders came to appreciate the constructive and sincere attitude that the marginalised stakeholders adopted. This resulted in the development of respect among the diverse stakeholders and an appreciation of cultural and economic differences. For example:

- Each group became aware of the difference in negotiation culture and were able to appreciate this as well as the needs of the other group. For example, the ‘white’ stakeholders acknowledged that the ‘black’ representatives at the meeting had an obligation to report back to their communities the outcomes of each session before they could make any decisions.
- The fact that all stakeholders (white and black) used Xhosa and English interchangeably to communicate smoothly and effectively in the workshops.
- Stakeholders’ acknowledged the diverse livelihoods in the catchment. For example domestic water users who rely on the Kat River water for their basic needs were given a say on the management committee of the WUA. In addition, the small and large-scale irrigators decided on having equal say on the Management Committee even though the large-scale irrigators are the minority group. This was because the participating stakeholders acknowledged the importance of economic activity in their area that provided jobs in the Kat River Valley as well as the revenue that would be gained from the large-irrigators that could be used to maintain the Kat River infrastructure, such as the dam.

In the second catchment-based workshop all stakeholders grew comfortable and accepted the open-ended nature of the task of developing an inclusive WUA constitution. This was because they acknowledged that a successful and sustainable WUA needed to be formed on active participation of stakeholders that required back-tracking at times to ensure that everyone had the knowledge and information in order to ensure the WUA constitution was inclusive. It took three catchment-based workshops to draft the Kat River Valley WUA constitution. In addition, numerous WUA Steering Committee meetings were needed as well as redrafting of the document on three occasions at the request of DWAF. DWAF reviewed the document to ensure that it met the needs of local stakeholders and was considered fair by the Minister of Water Affairs. Stakeholders, including DWAF, initially believed that the process would require six months to complete, but it actually took 26 months from October 1999 to December 2001.

Using participatory methods to build stakeholder capacity to actively contribute to the establishment of the WUA resulted in extra costs as well as loss of control over timing as activities spread from 1999 to 2001. However, these time and financial costs were offset by the stakeholders committing to the task and

not stalling the process or using it for their own personal gain. In addition I learnt that the process must cope with changes in decisions, reviewing and repeating past actions, and being prepared to persist in solving problems until stakeholders felt comfortable with the decisions.

I learnt that the unfolding process led to the diverse stakeholders owning the process and developing partnership relationships that are fundamental to the sustainability of the WUA. On reflection, the use of workshops to establish the voting system and the WUA constitution, negotiation, conflict resolution and participatory methods, provided a sound foundation to bring diverse stakeholders together to reach consensus on the formation of a WUA. Negotiation and dialogue from the outset was important in ensuring sufficient commitment to change on part of all the stakeholders.

In a multi-cultural setting, tensions could be exacerbated by misunderstanding and unfamiliarity. Therefore, I acknowledged that it was vital to have a fluent and sensitive translator (who often acts as a third party), capable of moving between various languages and culture groups with ease. I also learnt that researchers need to be aware of the possibility that if the interpreter shares a cultural background with a particular group of stakeholders, then the interpreter may feel pressure from those stakeholders to favour their issues over the other groups. Equally, the interpreter has to be careful not to intrude his/her views into the debate.

The role of the mediator operated principally as a catalyst for communication and problem solving by facilitating stakeholders' to explore alternatives and options further. I learnt that, ultimately, responsibility for the resolution rests with the negotiating parties. However, the negotiator can offer scenarios likely to spring from particular courses of action. I found that the mediator and impartial third party were very helpful in this regard. In addition, the mediator had no decision-making powers and no vested interest in any of the groups' issues. Thus it was vital that external negotiators are seen to remain neutral. I learnt that that neutrality does not, and should not, negate empathy.

In the formulation of the WUA constitution compromise was possible and even desirable in terms of stakeholder interests, but basic human and environmental (and sometimes cultural) needs cannot and should not be compromised. Such needs were very important in establishing the voting boundaries and thus the needs became the subject of long and intense discussion. For example, as the goal agreed upon at the Stakeholders' Workshop could not be compromised, it was necessary to hold three catchment-based workshops until consensus was reached on all matters needed to achieve the agreed goal of establishing a WUA.

I found that the steps to form an inclusive and collaborative CF and WUA do not occur in neat self-contained cycles of planning, implementing and reflecting. In fact, some activities relating to capacity building take place simultaneously or overlap. I learnt that it is important that stakeholders and researchers can cope with, and see the value of, the non-linear approach that corresponds to the action research approach. It is a process that requires continuously re-evaluating, learning, negotiation, listening and understanding in order to ensure that the change is sustainable.

It is important for stakeholders to understand that it is best to undertake the process of changing institutional arrangements collaboratively. In each step of the process I found that the stakeholders as well as the grassroots facilitators and I needed to be responsive and open to each other's different needs in order to participate in the planning, decisions and actions. In this, participants could acknowledge and ensure that there was the necessary support to overcome language barriers, and literacy instead of stakeholders naming and blaming each other for lack of skills, knowledge and racial or community difference. They could also appreciate and respect different ways of approaching issues. For example, the marginalised stakeholders should be given the opportunity to discuss the outcomes of the meetings with their respective communities before agreeing to decisions. Therefore, it is a process that requires learning by doing, reflection and learning with others to bring about the agreed upon change.

9.6 Participation - How to Involve Stakeholders in Catchment-Scale IWRM

The second research question is how to involve stakeholders in catchment-scale IWRM. To answer this question I use the example of establishing the CF in the Kat River Valley. A CF is not a statutory body like a WUA, as explained in Section 9.4.2. In Section 9.6.1 the use of a brochure, a newsletter, a catchment survey and invitation processes are presented to illustrate how to communicate IWRM concepts at a catchment scale prior to establishing the CF. The use of grassroots surveys, meetings and activities to involve stakeholders in IWRM are presented in Section 9.6.2 and Section 9.6.3 respectively to illustrate how to build interest and understanding in a CF. Section 9.6.4 presents the example of environmental awareness workshops while in Section 9.6.5 I use the example of the "way forward" workshops to illustrate how community representatives were elected to form a CF for catchment-scale IWRM. Tree planting activities, GIS training and a bus trip through the catchment, and an action planning workshop are presented as examples of initiation of a newly formed CF in Section 9.6.6, Section 9.6.7 and Section 9.6.8 respectively. These activities were used to build environmental awareness, initiate relationships, plan, debate and make decisions with the different communities of marginalised stakeholders in the Kat River Valley. The methods drew on negotiation, theatre for development, and PRA methods such as icebreakers and mapping skills.

There has been a rapid uptake of participatory methods amongst researchers and practitioners as they are understood to bring stakeholders together, are people-centred and inclusive (Ford, 1996). IWRM in South Africa has also adopted and accepted the discourse of participation and observes that stakeholders have a primary role to play as active participants in bringing about water resource management (WISA, 2000).

Stakeholders' involvement constitutes a cornerstone of IWRM that requires the representative involvement of all gender and racial groups and different sector enterprises to participate in decision making, dialogue, agreements and implementation of water resource activities.

Building on participatory methods, such as PRA, Action Research, Theatre for Development and negotiation methods (as outlined in Chapter Four) I address my second research question of how to involve stakeholders in IWRM so that all stakeholders are able to participate and develop partnership relationships. The methods used to address this question did not occur at one point in time in the research. In this section I draw on the example of how the team of grassroots facilitators and I involved marginalised stakeholders in the creation of their CF. I also show that to involve these stakeholders methods that enabled awareness building and development of group growth were used. As stakeholders began to regard themselves as a group the marginalised stakeholders were able to collaborate effectively with the former dominant stakeholder groups in the Kat River Valley in drawing up a logical framework (see Chapter Five for an explanation of these frameworks).

The planning stages to involve stakeholders in catchment –scale IWRM involved informing them of:

- concepts of water resource management at a catchment scale;
- the diverse stakeholders in the catchment; and
- meetings and activities.

9.6.1 Communicating IWRM concepts at a Catchment Scale

A brochure and a newsletter were used to communicate and publicise IWRM concepts and opportunities as well as local activities to stakeholders in the Kat River Valley. The brochure focused on IWRM concepts and the visions of the Fairbairn and Hertzog communities – as an example of marginalised stakeholders in the Kat River Valley. The newsletter focused on stories about diverse stakeholders to share with others what was already happening in the catchment and the needs and priorities of diverse stakeholders. Fairbairn and Hertzog participants were used to help communicate IWRM concepts and opportunities because of their previous involvement with my research and their willingness to actively contribute to the work. Given the limited budget available, I decided to use existing capacity wherever possible to ensure that other communities could be reached effectively.

The Brochure

The contents and format of the brochure were negotiated and planned together with Fairbairn and Hertzog participants at a planning workshop in March 1999. The content and purpose of the brochure was negotiated and brain stormed with the participants.

To develop the brochure the grassroots facilitators and I handed out sample copies of brochures from other water resource management projects to workshop participants. Through open discussions the participants and the research team agreed to develop a brochure. Through negotiations it was agreed that the brochure needed to communicate the following issues:

- the basic concepts of catchment management;
- some indication of benefits gained by striving for catchment management;
- the background of the research, the aims of the research as well as the visions of the Fairbairn and Hertzog people; and
- the current staff and funding agencies.

A brain storming exercise took place to enable participants to freely list their selection of activities and information to be included in the brochure. These ideas were evaluated after the brain storming activity to arrive at visions of what was needed to meet the communication goals of the brochure. These included management of catchment resources wisely to ensure sustainable income; ensuring that people in the catchment do not exploit the environment; encouraging catchment dwellers to learn to communicate and enter into negotiation with each other; and identifying catchment management as a mechanism that can facilitate other development needs. In addition, the participants from Fairbairn and Hertzog communities agreed and undertook to draw an emblem for the brochure to illustrate the concept of IWRM (See Appendix 4 Box 3 for the brochure and emblem).

The emblem drawn by Fairbairn and Hertzog community participants usefully communicated the basic concepts of catchment management to marginalised illiterate stakeholders to whom such concepts were new and foreign. For example, when the grassroots facilitators were implementing a catchment survey to identify stakeholder awareness and attitudes towards IWRM, many stakeholders had not heard of the concept of IWRM. In addition, there is no Xhosa word for catchment. It is not always easy to explain this concept by standing outside and pointing to physical features. Therefore, as the emblem displayed a picture of a catchment that closely resembled the Kat River Valley. The grassroots facilitators found the emblem a useful tool to explain catchment management, different stakeholder groups and land uses, as well as the concept of up and downstream.

On reflection, I found that the brochure had an immediate benefit for stakeholders in providing concepts of integrated catchment management. It also provided the background of the project, the aims of the project, the vision of the Fairbairn and Hertzog people, current staff, and funding agencies (See Plate 9-4 of stakeholder reading the brochure). The brochure was an effective tool for providing information to a wide range of stakeholders in an economical way.



Plate 9-4 : A Stakeholder Reading the Brochure

The Newsletter

The newsletter was produced to raise awareness of catchment issues and promote an understanding of the activities of the people in the catchment (See Appendix 4 Box 4 for a copy of a newsletter). The newsletter was created during early 1999 with interested undergraduate students from the Department of Journalism and Media Studies who incorporated the newsletter into their course work. The students interviewed and recorded stories of the different ‘lived realities’ and needs of the diverse Kat River Valley stakeholders with the assistance of grassroots facilitators. Photographs made the newsletter accessible to illiterate stakeholders as well as increasing interest for all the readers. The newsletter was produced in both Xhosa and English, and was widely circulated to local and government stakeholders.

The publication of a catchment newsletter early in the implementation of Phase Three provided an effective baseline for sharing the different ‘lived realities’ and needs of the diverse stakeholders in the

catchment. It successfully incorporated personal accounts of their lives and their relationship with the environment. The newsletter effectively captured the needs of diverse stakeholders and brought awareness of historical events, coping strategies of the diverse stakeholders and other projects happening in the area. Vivienne Hambly, one of the journalists, carried out an evaluation of the newsletter. Some of the responses showed that the newsletter had increased stakeholders' awareness of the catchment:

I now know everything we are doing here in the Kat River Valley, but not before. It is right to understand what is happening.

Before I had no idea of things happening in the area. I am also starting to tell of the importance of the water and environment.

I get an idea of what is happening in other places in the area.

I have noticed that in the Kat River Valley we depend on the environment and the environment depends on us.

The following responses showed how the newsletter had related to their life:

I have learnt that water is life.

My life depends on schools and rivers. Everything here relates to my life.

I have read many things in the newsletter. I have learnt the community can care for water and environment.

I have seen this project working.

(Hambly, 1999)

I found that the newsletter captured diverse stories of stakeholders and places that helped to build a picture of the catchment and a catchment identity.

9.6.2 Grassroots catchment survey to involve stakeholders in IWRM

The workshop held in March 1999 with the Fairbairn and Hertzog communities to prepare the brochure also resulted in acknowledgment of a need to collect information about community awareness and attitudes towards IWRM. It was agreed that this information should be collected through a catchment based survey. The Fairbairn and Hertzog participants, the grassroots team and I identified that the purpose of the survey was to: gain a deeper understanding of other stakeholder community dynamics, understand water use and management; and understand the interests of other communities in IWRM and their willingness to participate in the research.

The catchment survey needed careful planning and facilitation to enable stakeholders to formulate a goal for the survey. In the process of developing the catchment survey it was important for me to make known to the Fairbairn and Hertzog participants my own knowledge and skills in survey development and administration.

Questions in the catchment survey were prepared by the Fairbairn and Hertzog participants with my support. I then produced the survey forms at Rhodes University with the help of the community representative, who made sure that the final product was consistent with what had been agreed at the planning workshop. The survey was administered by the team of grassroots facilitators, who distributed and facilitated the survey in 15 catchment communities and with commercial farmers. The survey questions were willingly received and answered by participants. The grassroots team of facilitators recorded answers to ensure that all participants, literate and illiterate, could contribute. Results of the survey are presented in Appendix 4 Box 5.

The results of the survey indicated that catchment stakeholders saw that there was a need for water management, especially as stakeholders were relying on the resources of the Kat River. More importantly, the stakeholders saw water resources as a problem and expressed a willingness to engage in ways of solving these problems through communication between communities, individuals and the relevant organisations and government institutions. The diverse respondents from the Kat River Valley recognised the need to work towards IWRM.

Analysis of survey results took time as the research demands were high. Therefore, the results were only made known to stakeholders three months later by which time the research had shifted considerably to a position in which stakeholders were collectively sharing and prioritising their needs. In fact the Stakeholder Workshop had been completed by that time, although the survey did help me plan for that workshop. Therefore, in practice the cycles of reflection on this activity did not correspond to the pace of the research.

The benefits of the survey were: 1) the grassroots team learnt how to administer a survey; 2) it was planned with the Fairbairn and Hertzog stakeholders; 3) meeting stakeholders, observing their lives and surrounding environments made the grassroots team and me more aware of the socioeconomic realities of the diverse communities; 4) the grassroots team developed relationships with stakeholders; 5) information helped in the logistical planning of the research, for example, information of the size of the community (100 or 700 households) enabled us to cater for food as well as estimate the time it would take to invite stakeholders to a workshop.

On reflection, the survey provided the research team with a good working knowledge of the realities of catchment communities. This information provided an understanding of stakeholder needs and perceptions before the research commenced and was used by the grassroots team and me to plan and make logistical decisions. The execution of the survey was done in the participatory orientation.

9.6.3 Meetings and Activities to Involve Stakeholders in IWRM

During Phase Three, meetings and activities were conducted with stakeholders throughout the Kat River catchment (see Table 2-1 for a list of these stakeholders and Map 2-1 for the location of villages).

Informing stakeholders of meetings and activities being implemented as part of the KVRP, such as catchment workshops and environmental awareness workshops, as well as WUA Steering Committee meetings, ranged from writing articles for the local newspaper, door to door visits, publicly announcing workshops by using a loud hailer, using street drama and drumming in central places to attract a crowd, publicly presenting the necessary information, handing out or posting written invitations translated into Xhosa and English, phoning, and asking local stakeholders and school children to spread the message.

For example, drumming in central locations was used to attract a crowd and inform stakeholder groups who had not yet participated in the research. The grassroots facilitators and I would then briefly outline some of the functions of the catchment-based workshops that sought to create the CF and also to present a drama based on forum theatre or performance theatre methods described in Chapter Four. These dramas were used to invite stakeholders' comments and questions. The team of grassroots facilitators and I would then walk around these villages handing out open meeting invitations, distributing the research brochures and newsletters to the village people as well as being open to discussing, listening and answering any questions.

Invitations to workshops were designed to ensure that local stakeholders had access to all the essential information in their own language. Some invitations used the format of a brochure to present the message both visually and in writing. Visual content included photographs and drawings on coloured paper of differing sizes to catch the local stakeholders' interest. Writing was used not only to give the location, date and time, but also to complement the visual message by providing more in-depth detail that would help local stakeholders to judge whether to go to the meeting and, if they did, what issues should be considered. If the recipient of the invitation could not read, at least he or she had a copy of an invitation that he/she could ask a fellow stakeholder to read to them.

The approach used by the grassroots facilitators and I was based on the need to reach all local stakeholders so we avoided handing out invitations only to leaders or key people of the community. As this does not result in all stakeholders receiving an invitation to the workshop. Matthews Nontyi (pers. comm., 2000), a member of the grassroots facilitator team found:

I never thought that there are still dictatorships in South Africa until I went to organise a workshop in KRVP where I visited Gonzana, the village that is where one chief stays and owns land. We thought it is better to go via the chief. Our instinct did not meet our vision because the

community and chief are not working together. Therefore, it is vital not to take anybody's side but work on everybody's interest that included chiefs, farmers and community people, young and old, women and men.

Activities used to inform stakeholders of workshops and other IWRM activities were adapted according to each stakeholder group's circumstances, by considering the following options:

- ability to access resources (public announcements in newspapers, telephonic invitations or door to door visits);
- literacy (written invitations, invitations that use writing and pictures, public announcements); language (the vernacular required to inform stakeholders);
- the season (not to have workshops during planting, harvesting, pension days);
- knowledge of process (being new to the research requires more detail than if a stakeholder had been part of the process).

I also found that it was important to prepare for, and inform stakeholders about the logistics of IWRM activities – for example the availability of transport, length of the workshop, and provision of food at a workshop. I found that this information enabled stakeholders to make necessary household arrangements in advance so that they could participate. I also found that it was important to supply information on the purpose and goal of the activity, report outcomes of the previous activities and explain IWRM concepts required for effective participation. This enabled stakeholders to make the choice of whether or not they wanted to participate, and if they did they, to ensure that they had access to all necessary information.

As the invitation processes required the grassroots facilitators to be located in the catchment, this resulted in them also being able to provide necessary support to participants, such as listening, guiding, answering technical questions identified by participants and reviewing the process. The distribution of documents from previous workshops to catchment stakeholders during the invitation process often resulted in stakeholders' requesting for the grassroots facilitators to explain or discuss these documents.

Through the Phase Three research I identified that an effective invitation process required a large investment in human resources and field expenses. This was managed by adapting the process to integrate additional activities to save on further trips to each village, such as confirming venues, arranging for local cooks to prepare food for workshops, hand out previous workshop reports or maps as well as mediating conflict. Ntsebeza (2001), the grassroots worker from Fairbairn, explains some of the tasks that the invitation process involved:

When we were running workshop my role was to hand out invites to the villages and negotiate about the venue. Then I would make a follow up visit to the villages to make sure that the venue is available and there is no other activity in the village that will make clash with the workshop. So that follow up must be done before the workshop. I was organising two ladies to make tea in the workshop and they must come from the villages where the workshop is held. Then the team and I solve conflicts in the villages, for example workshops that brought two villages together. The villages would state that they wanted the workshop in their village and did not want to in the other ones' community hall. Then, we need to go to them and negotiate with them and told them that we were going to talk about environment not politics, then they came together until now. The villages were Tidburys' Toll and Oakdene. Also, I needed to plan for the team to make sure they get the accommodation in the Kat River since they live in Grahamstown.

I found that the invitation process needed to be thorough and give the choice to stakeholders if they wanted to participate. Undertaking this process thoroughly prevented conflicts or disruptions in an already complicated task of setting up a WUA or CF in an area of racial, gender, and inter-group hostility, as described in Chapter 2.

I learnt that prior to workshops, stakeholders needed to have correct and appropriate information in order to be able to participate and make informed decisions. As Leurs (1998) states “those with less power also tend to have less access to knowledge and information or less power in defining what sorts of knowledge and information are useful in development. Such relative ignorance makes them objects rather than subjects in development” (p.133). However, it was important that this information was not dumped on the stakeholders. With the support of the grassroots facilitators this process ensured that stakeholders had a good understanding of the information and support could be given to stakeholders who were illiterate.

9.6.4 Environmental Awareness Workshops – May 2000

A foundation for the CF was built in May 2000 by undertaking nine environmental awareness workshops with 15 marginalised communities (communities close to each other were brought together in a central venue to fit the costs to the available budget). These workshops involved stakeholders in a transect walk along a chosen site of the Kat River with the team of grassroots facilitators. The participants at each workshop observed, recorded and discussed with each other the condition of the environment. Although the activity did seek accounts of the riverine ecology, the emphasis was on providing participants with the opportunity and the time to walk in their own riverine environment and reflect on it. The grassroots facilitators provided support for stakeholders who wanted to write or talk through their observations. Afterwards, the grassroots team facilitated focus group discussions in which stakeholders could reveal

their perceptions about their riverine environment and identify concerns or opportunities of water resource management for current and future generations. For example, the observations of ‘good’ and ‘bad’ things elicited by participants in the workshop held at Gonzana are listed below:

‘Good Things’ – Gonzana Environmental Awareness Workshop

- I see *ingcongolo* (Reed *Phragmites* sp.) and it is good for our environment because we can build houses with it and diviners also use them.
- Trees are good for our environment especially when they are green they make the river beautiful. They also help in soil erosion.
- Grass is good as well because it makes the river green and stock feed them on it. It also helps in soil erosion.
- Sand helps us when we want to build our houses and the bridge.
- *Umgcunube* (Willow tree *Salix babylonica*) is used by our healers to heal people.
- Reed helps us when we want to make traditional mats and baskets.
- *Unukanuka* (Wild Marigold *Tagetes minor*) helps us when we have ‘flu’.
- Water is very important to us because we drink it, wash and cook with it, our stock as well drink water and we water our fields with it.
- A stone helps in soil erosion.
- *Intsasela* (smoke from burning wood) is medicine that is used when we thank our ancestors for good things they have done for us.

Bad things – Gonzana Environmental Awareness Workshop

- *Adywabasi* (alien vegetation such as Black Wattle *Acacia mearnsii* and Gum tree *Eucalyptus*) sucks a lot of water and that affect the amount of water in the river.
- Water is not in good condition for people to drink because it is polluted.
- Rotten oranges are not good near the river because they cause lot of germs.
- Dry trees inside the water blocks dirty things such as dead donkeys, dogs and cows.

From the participants’ presentations I collated and documented their findings into a booklet titled ‘Care for the River and the River Cares for You’ - Environmental Awareness Workshops 2000 (see Appendix 4 Box 6 for the booklet in English). The booklet documents the results of each transect walk in two broad sections, ‘good’ and ‘bad’. The booklets served as a record of environmental threats and opportunities at both a local and catchment scale for the stakeholders, the grassroots facilitators and me. The layout and compilation of the booklet integrated the results of the 15 community groups’

environmental threats and opportunities into one document. This is important as action research relies on the stakeholders and the researchers having sound information to enable decision making, stimulate dialogue and find appropriated solutions.

The booklet was translated into Xhosa. These booklets were handed out and demonstrated to participants at the 'Way Forward' Workshop in June 2000. As shown in Plate 9-5 workshop participants read the booklet.



Plate 9-5 : Participants Reading the Booklet

I found that the environmental awareness that resulted from stakeholders participating in transect walks conducted with each environmental awareness workshop along a section of the Kat River helped groups to relax, convene and build up knowledge. The participants took this exercise seriously. They enjoyed gathering their own information and sufficiently presented their findings to the broader workshop group.

9.6.5 The 'Way Forward' Workshops - in June 2000

The 'way forward' workshops were held in each of 15 marginalised stakeholder communities to enable the participating stakeholders' to select the people who would represent their community on the CF. At the start of the village-based workshop, participants were given the opportunity to set the objectives for the CF locally and at a catchment scale. The activity involved stakeholders firstly thinking through the purpose of the CF, then the qualities the CF representatives should have and thirdly what their role

should be. Participants at all 15 workshops were encouraged to call out these ideas. These statements were recorded on a large piece of paper in both English and Xhosa for all to read. No evaluation or reflection took place until stakeholders felt that topic was covered.

After all ideas were read out, participants reflected on their ideas and priority ranked key characteristics for the CF representative. Following this a nomination process took place that required each representative to give a personal statement of their reasons for wanting to be part of the forum stakeholders.

The 15 'way forward' workshops provided an opportunity for villagers to define skills, characteristics and roles for their CF representatives. Prior to electing the CF representatives, each participant discussed and set objectives for the CF both locally and at a catchment scale. For example, the participants from the community of Balfour stated that the CF representatives needed to be able to: teach, communicate well with their own community members as well as other forum representatives, negotiate with up-stream and down-stream villages to keep the environment clean. This process also resulted in participants, grassroots facilitators and I requesting for each nominated person to share their reasons for wanting to be part of the forum. The nominated Balfour Catchment Management Representative stated:

As a child I have always loved the environment. I would like to teach people about the importance of the environment especially the youth.

Other communities recognised the following requirements of the CF representatives as dissemination of information on IWRM; to promote interaction, discussions, debate and consultation; coordinate activities; foster cooperation, monitor water resources and to identify problems.

I found that it was important for the development of the CF to be built on accountability, understanding and with consideration for the future. The community participants for each area identified the characteristics (skills, roles, and attributes) for their CF representative that shifted the focus from CF representatives being political appointees to skilled-based appointees. The brainstorming and discussions enabled each participant to analysis and interpret the skills needed for a CF representative. On reflection, this made the broader community feel part of the CF and also provided a boost to their confidence in their knowledge, their ability to make decisions and elect their CF representatives. It also enabled the CF representative to feel the importance of their role and become committed and enthusiastic as they took on roles and responsibilities.

The effective election of CF representatives laid the basis for an effective working CF that complements and adds value to the Kat River Valley WUA.

9.6.6 Tree Planting to Involve Stakeholders in IWRM

A tree planting activity was identified as an opportunity to help build group spirit and implement a catchment-scale activity with a tangible output that could be understood by many participating stakeholders. Setting the tasks for the tree planting activity enabled participants to become involved in the planning and implementation of activities. Commercial farmers and marginalised community stakeholders participated in this activity. The planting of indigenous trees in 15 villages and on two commercial farms involved CF representatives at the local scale. The choice of trees and their characteristics were discussed with the CF representatives prior to planting the trees, in particular the height of the trees when mature. This was to give the CF representatives the opportunity to discuss with their communities the characteristics of the trees so that they could decide what trees they wanted to plant, where they would plant the trees, select the sites, and decide who would be responsible for watering the trees. The trees selected were Sneezewood (*Ptaeroxylon obliquum*), Cabbage Tree (*Cussonia* sp.), Kei-Apple (*Dovyalis caffra*) and Pompom Tree (*Dais cotinifolia*). CF representatives were also informed that this activity would take place with 15 village and two commercial farms and therefore, with the limited resources available, a date needed to be set so that all trees could be delivered on the same day by the team.

The planting of the trees was mostly undertaken on the day the trees were delivered. The respective communities had organised the necessary implements, the sites, and involved many people from the community in the activity. Plate 9-6 shows participants receiving their trees in preparation for activities to collaboratively plant trees for catchment management. The activity resulted in fostering cooperation as well as celebrating the development of the CF and their representatives. There was much excitement, interaction and celebration of working as a community towards a common IWRM goal. The behaviour of participants and their comment indicated a shift away from marginalised communities feeling abandoned to feeling part of water resource management decision making in the broader catchment.



Plate 9-6 : Participants Preparing to Plant Trees

The act of reflection and celebration of the tree planting activity was an integral part of the process of capacity building and needed to be included in ongoing activities. It was important to appreciate that capacity building was concerned with creating confidence. This goal was realised by affirmation of their role as legitimate stakeholders in IWRM and openness to doing things in a participatory way that was different from the past.

In addition, I found that setting tasks encouraged participants to take responsibility. On reflection, it provided the opportunity for stakeholders to acknowledge that they were capable of undertaking tasks. The activities surrounding the planting of the trees resulted in participant behaviour that indicated that CF representatives and participating community members were filled with enthusiasm, keenness to participate, a desire to have a say and work together. In taking responsibility, stakeholders began to rely on their own skills to mobilise resources such as digging holes for the trees and knowledge of how to plant trees. It was important that the stakeholders felt that they ‘did it’, ‘said it’ and ‘shaped it’. In this way participants started to become committed to the CF with their heads, hearts and hands – thus adding value to the CF.

9.6.7 GIS Training and a Bus Trip to Involve Stakeholders in IWRM

An action planning workshop was planned for July 2000 to enable diverse stakeholders to identify and plan IWRM activities for the Kat River Valley. At this workshop it was planned that participants would 1) identify priority IWRM activities; 2) name the inputs, outputs and outcomes associated with the activity; and 3) mark the spatial location of these activities onto a colour Landsat satellite image of the catchment. In order to build their capacity to effectively participate in the action planning workshop, GIS training activities and a bus trip through the catchment were conducted in June 2000 before the workshop.

Alistair McMaster, a Masters student with skills in the use of Geographical Information Systems (GIS) expressed an interest in participating in this exercise. I helped to build his capacity in participatory methods and he provided technical assistance to participants in both the CF and WUA. McMaster prepared colour Landsat satellite image of the catchment and CF representatives agreed to participate in a preparatory workshop prior to action planning for implementing IWRM activities. At the preparatory workshop McMaster explained the colour Landsat satellite image. Then the participants were given the task of identifying the location of planned activities on the map, then to locate their community on the image and use the colour Landsat satellite image to identify and explain the patterns of vegetation and terrain. Plate 9-7 shows a workshop participant identifying physical features on the colour Landsat satellite image.

The CF representatives approached the tasks involved in learning to read colour Landsat satellite image with sincerity and a willingness to help each other. Landmarks were identified on the ground, such as the mountains, the Kat River and fields. Participants were then asked to locate them on their colour Landsat satellite image. This resulted in them quickly being able to read the images. I noted that the colour maps made it easier for the participants to read the map, as the pink areas generally showed exposed land, dark green forested areas and intensive irrigation, with light green to brown showing cattle grazing areas and non-irrigated cropped land and the blue identifying the river and the dam. The representatives using these skills of looking at the different features of the map could locate their communities and highlight briefly some land use activities (See Map 2-2 for the colour Landsat satellite image used for these activities).



Plate 9-7 : Participant Identifying Physical Features on GIS Base-Map

To complement this preparatory work, a bus trip was organised as a catchment-scale transect ‘walk’ to enable CF representatives to make the linkages between the colour Landsat satellite image and the catchment landscape. CF representatives were split up into three groups, each using a bus to tour the catchment. As the trip progressed through the catchment, each stakeholder told the story of their area and expressed their water resource management needs. The tour was effectively a transect walk at a catchment scale - a tool used to enable CF representatives to observe, question each other and generate ideas for identifying riverine and water resource management concerns. At each community the CF representatives from that community presented their local socio-physical conditions to other participants and explored ways of helping each other implement IWRM activities.

The bus trip planned to visit all villages represented on the CF. Listening and dialogue among the CF representatives resulted in lengthier and more meaningful interactions so time only allowed for seven of the fifteen participating communities to be visited.

During the bus trip, participants were able to locate these seven communities on their colour Landsat satellite image. However, when the CF representative of each community outlined their land uses, the participants did not record them onto their maps but in their notebooks – a resource presented to them at the time of their election to the CF. Plate 9-8 shows participants recording information during the catchment-scale tour. In the presentations that were given by each CF representative they realised that they had common issues: dirty water, soil erosion, lack of secure land tenure (see Chapter Two), overgrazing and unsustainable harvesting of trees. These started to emerge as overlapping needs (see Figure 4-2) that became priorities in the action planning workshop held later. The stakeholders’ focus was mostly concerned with the negative aspects of the catchment. The bus trip enabled participants to identify areas of need in the catchment and build a spirit of cooperation within the CF.



Plate 9-8 : CF Representatives Listening and Note Taking

On reflection, I found that the bus trip was a useful first step to introduce the CF representatives to their role in mobilising action in IWRM in the Kat River Valley. In this role, CF representatives were introduced to the importance of gathering and recording information as a foundation on which to make decisions. The task opened up the importance of CF representatives sharing information, posing questions and discussing IWRM concerns with each other. However, it was important to ensure further collaborative processes to build good and open relationships between the CF representatives, such as at the action planning workshop held in July 2000.

9.6.8 Action Planning for Implementation of IWRM at Catchment Scale

An action planning workshop was implemented in July 2000 using the framework of Fargher (1996). Diverse stakeholders participated in the workshop to identify and plan IWRM activities for the Kat River Valley. Participants 1) identified priority IWRM activities; 2) named the inputs, outputs and outcomes associated with the activities; and 3) marked the spatial location of these activities onto a GIS map of the catchment. (See Appendix 4 Box 7 for the action plans developed by workshop participants).

The action planning workshop brought together the following diverse stakeholder groups: CF representatives from 15 marginalised communities, the WUA steering committee and interested commercial farmers. The two-day workshop set out to prepare a Kat River Valley Action Plan. This workshop drew on the skills of an outside facilitator, a MSc student, the team of grassroots facilitators and me.

At this workshop a framework was used to enable stakeholders to work together to establish priority activities in the upper, mid and lower Kat River Valley (see Map 9-1). The participants organised their information into an action framework that recorded in detail (Fargher, 1996):

- each desired activity (what to do);
- its inputs (who will do it - primary responsibility, how to do it, how much it will cost, who will pay);
- its outputs (immediate changes in the community and environment that will occur with the project);
and
- its outcomes (what changes in the community and environment will occur with the project).

The exercise also required the stakeholders to mark the location of planned activities onto a GIS base map. The capacity built in the GIS training and bus trip activities enabled participants to confidently participate in this exercise.

The action planning workshop resulted in local stakeholders developing a work plan which identified their IWRM needs and collectively debating and considering the steps to move their identified needs to action. The discussions also further developed participants' abilities to dialogue about a range of interests, biases, expectations and concerns in water resource management. For example in discussion with the lower Kat group, a commercial farmer expressed interest in building a large weir if consent from the DWAF and other stakeholders was obtained.

In completing the action frameworks diverse stakeholders were able to systematically consider all the inputs that would be required for their identified priority needs to be implemented. For example, participants from the upper Kat catchment acknowledged the need to gain information concerning IWRM development projects. They further identified that carrying out this action required the following inputs: compiling a data list of possible agencies, making contacts with them to gain information about them, and record and file the information for stakeholders use. This resulted in the stakeholders understanding that different activities have different inputs, with different tasks and responsibilities and resources (financial, human and technical). It also enabled them to understand that implementation of activities requires collaborative input from local stakeholders. Through interactive discussions stakeholders came to recognise that they do have expertise to contribute to activities and should not rely on outside agents alone to bring change. In addition, by stakeholders attaching the different inputs to each activity stakeholders were able to recognise the value of planning each activity prior to implementation to ensure that it will lead to the desired outputs and outcomes.

The process resulted in stakeholders identifying priorities and planning for implementation. The ultimate output of the action planning workshop was a planning framework, which stakeholders built together.

Many of the activities identified by marginalised groups were focused at the village level – for example activities to ensure that villages are safe (no litter, good drinking water, wind breaks), attractive (trees, no litter) and viable (good land management for cattle and crops, trees for harvesting fire wood). These needs were focused on immediate human needs and so could be interpreted as being rooted in the anthropocentric ecological paradigm (see Chapter Three). However, many of the longer-term priorities were catchment-scale and environmental management actions that demonstrated a shift in understanding from an anthropocentric to an eco-centric ecological paradigm.

Many of the activities identified by the ‘white’ commercial farmers were focused at the interface between their enterprises and the catchment – for example their immediate need was to enable certification of an environmental management system to ISO 14001. They also identified the need to ensure good working relationships between the stakeholder groups of the Kat River Valley and a good water allocation system (See Appendix 4 Box 7 for the action plans developed by workshop participants).

Participant groups from the upper, mid and lower Kat catchment each elected a presenter to outline three short-term priority actions and three long-term activities. This resulted in the diverse local stakeholders understanding one another’s concerns and identifying overlapping interests. This inspired the development of a catchment-scale proposal, with Landcare program funding, to tackle land degradation, an important factor affecting both land and water quality in the catchment. The proposal was submitted to the National Department of Agriculture in late 2000 and funding was approved in May 2002.

The action planning workshop held in July 2000 was the final activity undertaken with the local stakeholders in the thesis research and marked an end in my active engagement with the CF. The collaborative plan resulting from the final workshop did not automatically result in implementation of the activities. The research activities would have had a better chance of bringing about better environmental management and improved livelihoods if arrangements for sharing the costs, benefits, management responsibilities and implementation had been established earlier on in the research between stakeholders and outside agents such as DWAF and the Provincial Department of Agriculture.

On reflection, prior to developing an action plan, links should have been established with institutions that could work with the local stakeholders to implement their plans. The lack of tangible outcomes or practical solutions hindered their ability to adopt changes in their water resource management behaviour. This was exacerbated by marginalised communities having little financial or technical resources to manage

their environment sustainably. Jerry Ntsebeza, a member of the team of grassroots facilitators, statement below presents the challenges (pers. comm., 2001):

Catchment Forum and Water User Association, they need administrations skills and research to make differences on the ground. They will work hand to hand so that the development can be sustainable. The most thing that the catchment forum can do most of that time is sacrifice work voluntarily, confidently, not all the time need to get something (money) to do some work. I hope that catchment management will be well owned by the Kat River Valley people and they must not think that there will be someone from outside to manage their catchment they must use their experience that they get. I hope through catchment forum and water user association in the Kat River Valley will have better catchment and they will be the example in the whole of the country.

My experience showed that process orientated research (that is focussed on capacity building, government commitment, negotiation to establish institutional arrangements) only enabled on-ground activities that related to human and social capital, such as picking up litter. Although local participants developed the ability and confidence to approach outsiders and negotiate their needs through participation in my research activities, they did not have the 'expert' knowledge to implement environmental changes without assistance. Therefore, for more technical issues the communities were reliant on the outsider coming in and doing the job with them.

The Action Plan resulting from the July 2000 workshop is a useful analysis and presentation of priority actions for IWRM in the Kat River Valley. As an indication of their group maturity, the Kat River Valley CF in May 2002 initiated the presentation of the Action Plan to financiers including the Provincial Department of Agriculture, DWAF and bilateral donors such as the British Department for International Development (DFID) and the Danish International Development Agency (DANIDA). The delay between the workshop and the search for investment is a result of the CF representatives' efforts for establishing the WUA and helping build the Fairbairn Bridge during the same period.

9.7 Independence for Sustainability - How Much IWRM Can Marginalised People Do for Themselves?

The third research question explores how much IWRM activities marginalised communities can do for themselves. This is a question of sustainability – of maintaining action and commitment after research activities and external resources are withdrawn. To answer this question I use the example of a local leader and how building his capacity enabled a community to initiate and participate in the construction of a new bridge at Fairbairn, as introduced earlier in this Chapter. I use this example because of the importance of local leadership in driving community actions at household, village and catchment scales. The influence of the leader in this example spreads from Seymour to Fort Beaufort through his active

leadership in the CF and the formation of the WUA. This was recognised in May 2002 when water users of the upper catchment elected him as one of nine founding members of the Kat River Valley WUA.

Effective water resource management ultimately relies on stakeholders carrying on IWRM activities themselves once the researcher/facilitator leaves. It is critically important that methods and activities used for IWRM enable stakeholders to build capacity to implement tasks sustainably. The research activities to find out how much marginalised people can do for themselves draws on Table 9-1 and is briefly outlined in this section.

Action research emphasises outputs. It seeks real change that directly benefits stakeholders in the research. It requires the researcher to not just focus on process - information gathering, awareness building – to bring about a change identified with participants but to also focus on outcomes – biophysical and socio-economic change. The drive for change is conducted with the participants when they become part of the planning, analysis and problem posing rather than the researcher or outsider determining what they should do. The participants need to be clear about what the output is so that they are not misled and their expectations are not raised beyond what the output is likely to be. In action research that drives towards an output the researcher is a key actor in the processes. The responsibility for the action is shared between the participants and the researcher.

9.7.1 Establishing Independence for Sustainability

Capacity building drew on participatory methods and negotiation to enable marginalised stakeholders to learn, understand, feel confident to plan, analyse and carry out IWRM. Responsibilities were shared with stakeholders and skills to communicate were developed. Capacity building also provided an environment for the team of grassroots facilitators and students participating from Rhodes University to learn and carry out participatory approaches.

In 1999, Jerry Ntsebeza from Fairbairn became part of the team of grassroots facilitators. As a result of the experience he gained from working with me to implement the Phase Three activities (for examples of these see Sections 9.6 to 9.9) Jerry developed the capacity to lead participatory activities. I therefore gradually withdrew my facilitation role from Fairbairn community between 2000 and 2001. I built the capacity of Jerry Ntsebeza, as an elected leader of Fairbairn community, to enable him to work with Department of Public Works and MBB Engineering (consultant engineers) to build a new bridge. During the transition period when I was gradually withdrawing my facilitation role, Jerry Ntsebeza and I would reflect on the process, appreciate the realities and explore the logical and strategic options for each action. Through this period, Jerry Ntsebeza held meetings with the community people, wrote further

letters in collaboration with the community, visited the Department of Public Works and the tendering company MBB Engineering. He also negotiated design concepts and working relationships with MBB Engineering, and saw to the community's inputs for implementation of the Fairbairn bridge.

Jerry Ntsebeza noted that some of the methods he used in facilitating the building of the Fairbairn Bridge were:

- **Writing letter:** I write letters and always copying them to other involved parties
- **Phoning:** I always providing my contact number and I make a point of phoning regularly. This often results in building a good relationship and is reciprocal (i.e., they phone me and I phone them).
- **Make face-to-face contact:** This gives me a sense of being in control of our development. I know where they are and can start negotiating and keep to promises. For too often the developer is the one that comes to the village and can make promises and leave without further contact.
- **The Costs:** There is a great cost in establishing and building an accountable relationship with developers. I need to travel, phone, and correspond on a regular basis. It is easier to take this money from my own savings as it is time consuming to collect money from the community - i.e., waiting for pensions. If a developer comes to the community and negotiates a project it is crucial that this is followed up immediately, and therefore, I use my own money.
- **Continuous Involvement:** My involvement in these projects is by no means once off. It takes place through all stages, from negotiation, to planning, to implementing, to monitoring. An example was when we as a community have to think ahead in regards with the bridge construction. We anticipate that the bridge construction will destabilise the river banks and we thought that by planting trees ahead of time, it way help to reduce future erosion.

Under the leadership of Jerry Ntsebeza, the Fairbairn community were consulted and often participated in each action and gradually took more ownership of each task in motivating the bridge building. For example, community participants contributed to activities such as: learning to write official letters; dialoguing with the outside agents (such as Department of Public Works and MBB Engineering) over the phone, inviting the outside agents to their village and visiting them at their offices; negotiating contractual agreements with outside agents (how many village people would be employed; what rate the village people would be paid); and read through building plans. The community invited Kate Rowntree and me to review the potential environmental impacts of the bridge.

Building the bridge commenced in October 2001 in collaboration with the community of Fairbairn and was finished in December 2001. In April 2002 Jerry Ntsebeza, with the support of the community, raised funds to hold a celebration day to officially open the bridge, as shown in Plate 9-9. The opening

of the bridge was well attended and celebrated by communities of the Kat River, the CF, Public Works and MBB. A celebratory speech given by MBB reported that (MBB representatives pers. comm., 2002):

I have worked with many communities. This community of Fairbairn are open to communication and negotiation. They were able to directly communicate with us throughout the bridge building process.

The bridge building project was grounded in a broad commitment to collaborate. In addition, the participants saw the value in continuously reflecting on the process and keeping up to date with all developments. The participants' commitment and earnest efforts to this project over a four year period resulted in smooth implementation where both the community people and outside agents built a communicative relationship based on a readiness to work towards the best outcome. It was also important that it was the community people with Jerry Ntsebeza who took over the process of negotiation and implementation with the outside agents. It was therefore important in the participants' evolution that I worked myself out of a facilitative role.



Plate 9-9 : The Official Opening of the Bridge

On reflection, with experience and confidence Jerry Ntsebeza, a grassroots facilitator and community member, was able to start to do things on his own initiative, to take over responsibility, devise plans with the communities without getting other grassroots facilitators and me involved. Jerry Ntsebeza was able to make his own decisions, listen to community members, and be accountable for his actions by reporting back to the respective communities at the village level. I found that his behaviour and attitude traits became part of the basic values of participation that are associated with participatory philosophy. The

gradual building of confidence, self-esteem and understanding of the importance of good attitude, and behaviour enabled doors to open. For example, he was able to negotiate building of the bridge with the outside agents in partnership with the Fairbairn community.

Through Jerry Ntsebeza learning by doing in the Phase Three activities and being elected to a leadership role by the Fairbairn community, he started to contribute to the confidence felt by Fairbairn community members. This was reflected in their willingness to participate in IWRM activities, and led to an increase in their self-esteem, skills, flexibility and resourcefulness as well as willingness to take on responsibility.

Through the empowerment of a key community leader, and active participation in a range of Phase Three activities, the Fairbairn community gained a new bridge and an active role through elected representation on both the CF and the WUA. The new bridge was beneficial to all in the Fairbairn community (as evidenced by the high priority Fairbairn participants gave to the bridge in the Stakeholders' Workshop described in Section 9.6). It was the first tangible evidence that Fairbairn people could engage with outside institutions for the benefit of themselves and their management of water resources.

I found that it was important for Jerry Ntsebeza to understand the concepts of participatory work and IWRM as it helped him to understand what he was doing, why he was doing it and to engage with other community participants. It also instilled the need to ensure good quality of work. Jerry Ntsebeza learnt about good quality work, the PRA and IWRM concepts, and participatory tools through his practical experience as a member of the team of grassroots facilitators supporting implementation of Phase Three activities, as well as sharing with other stakeholders. I found that Jerry Ntsebeza's reflection on his behaviour and attitudes spread into his own life and thus did not only become rooted in the work place - it went much deeper which also gave him confidence in himself. This is evidenced by the high regard in which Jerry Ntsebeza is held by the community of Fairbairn and other neighbouring communities including those of Hertzog, Balfour and Seymour. He is also held in high regard by DWAF and commercial farmer stakeholders.

The capacity built in Jerry Ntsebeza also enabled him to continue working in IWRM using participatory methods and improve their skills and practices after I left. Most importantly, Jerry's leadership role enabled his learning to be passed on to other community members – so that the process of change through planning and action research was incorporated into the community way of doing things. For example, members of the catchment forum benefited from Jerry's leadership. In this way the research activities initiated as part of this thesis, and reinforced through the KRVP and the bridge construction project, resulted in sustainable change in the capacity of the Fairbairn community to actively participate in IWRM activities.

9.7.2 Building the Capacity of Students

The research activities were also used to build capacity of other Rhodes University students who could add value to the KRVP and provide an on-going resource to support participatory IWRM with other communities. Most of the students came from scientific backgrounds and for most it was also their first exposure to working with diverse stakeholders in rural South Africa. Incorporating students into the research required building their confidence, skills and understanding of the principles of participation. It resulted in the grassroots team of facilitators and I working in partnership with them over many months, and supporting them through learning by doing activities that contributed to their skills and intellectual development.

The process also resulted in the need to pay close attention to their needs and to how to best incorporate them into the research in such a way that they had an incentive to work with the stakeholders. This approach resulted in them gaining a sense of ownership, responsibility, and recognising the importance of examining their attitude and behaviour. The students also contributed to the research activities because they added different skills (for example GIS and journalism skills), fresh view points, information, as well as giving their time to support logistical activities. The outcome of including students in the research was that they became committed to the research with the GIS student taking on management and leadership roles when my research activities ended.

9.7.3 Evolution of Stakeholder and the Grassroots Facilitator Capacity

In this section, I reflect on the research process that looked for ways in which to enable participating stakeholders to prioritise their needs and actively participate in IWRM.

My findings were that the methods employed facilitated a process of capacity building and sustainable change in awareness and attitudes. The thesis research did support attitudinal change relating to IWRM, but did not have the resources to support significant behavioural change affecting water resource management. However, I found that participants' capacity affected their ability to act on their needs. Therefore, capacity building was found to be a process in which stakeholder groups evolved over time. In the course of the evolution of participants' capacity, many factors directly and indirectly shaped and impacted on their ability to participate. These factors were frequently embedded in the participants' identity, local knowledge, life experiences and personal relationships, as well as in broader contexts such as their gender, cultural, economic and social positions (Erade, 1997).

Fargher (1999) recognised the need for the capacity of groups to evolve through three core stages: group initiation, group growth and group maturity for water resource management, as shown schematically in Figure 9-1 (Fargher, 1999). Likewise, my findings in Phase Three show the Kat River Valley participants

moved through awareness and learning, to sharing and forming sustainable institutional structures. I also found that as environmental awareness grew, the focus of IWRM activities evolved from a focus on immediate local needs to inclusion of the needs of the wider environment and future generations – a shift from anthropocentric to eco-centric ecological paradigms (see Chapter Three).

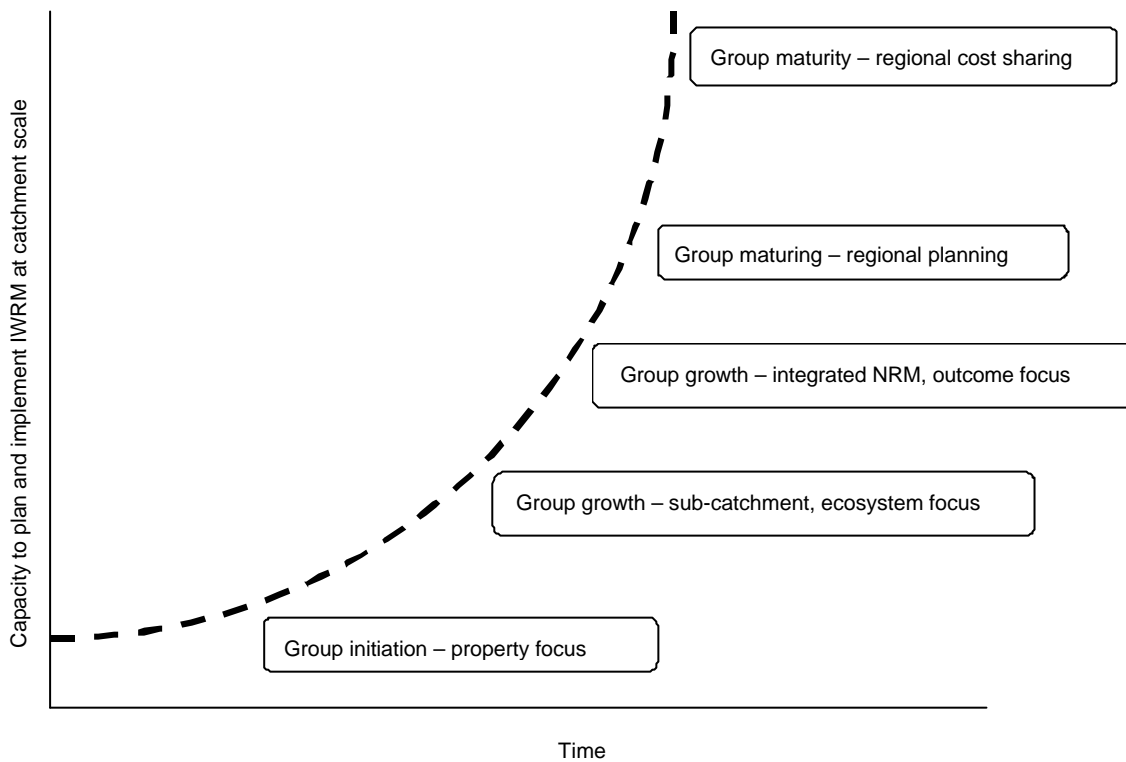


Figure 9-1 : The Evolution of Capacity for Effective Participation (Fargher, 1999)

However, I found the process was not one in which participants climbed ever upwards until they reached maturity, but rather a process that required repeated ‘backtracking’. For example, the participants reached a point where they are able to prioritise the need to develop a WUA. Some marginalised participants’ felt that at this point that they required repetition of an initial ‘awareness’ program. I found that this could not be interpreted as regression; it was part of the cyclical growth towards effective participation – consistent with the iterative nature of action research.

An appreciation of diversity was important to handle feelings of frustration engendered by the need to re-address some issues, possibly repeatedly. Capacity building required time to stimulate growth and action through participants’ construction of knowledge, discovery, recognition and developing the ownership necessary to bring about changes. I also found that approaches to enable capacity building and participation were neither fixed nor formulaic as each participant’s needs and capacity to participate in negotiated targets were different.

The steps indicated in Figure 9-1 are explored in sections 9.7.4, 9.7.5 and 9.7.6 with respect to the Kat River Valley participants and to the approaches used.

9.7.4 Group Initiation - Awareness Building

In the first step of the evolution of participants' capacity, the focus was on awareness building. The methods were directed at creating awareness and building capacity to enable participants to take part in IWRM activities. Such a stance is in keeping with Freire's (1972) observation that awareness building or active education brings about liberation and sets into motion a process of dialogue, resulting in participation by stakeholders. Such a process used innovative methods to involve the participants in understanding and internalising IWRM concepts. These concepts were components that were continually integrated into the awareness creation programs, enabling participants to gain a firm foundation for understanding IWRM and allowing them to enter into IWRM debates.

The process of awareness building also included the research team. For example, the team of grassroots facilitators and I needed to develop our awareness of the socio-physical and historical context of the Kat River Valley catchment. Having a solid and sensitive understanding of this made it easier for us to develop a rapport with the participants.

I found that supporting the process of awareness building required not only that the tangible needs of participants were focused on, but also that intangible needs were understood. Some needs were not readily presented by participants, requiring the grassroots facilitators and I to be patient, open and flexible while these needs were being identified and articulated. As a practical example of this, processes used in the research required that participants had some understanding of a catchment including general aspects of IWRM. Equally, they needed to grasp that the boundary of the catchment included land through which, or over which, water moves. This was conveyed using a bus trip through the catchment and the use of GIS maps, as described in Section 9.7.7. The spatial considerations included understanding where one lives in relationship to other stakeholders or to particular water resources, amongst other issues. This information was also covered in a catchment-wide community newsletter.

9.7.5 Group Growth - Planning for Action

In the second step in the evolution of capacity I was supporting group growth. This focused on the institutional arrangements and processes that enabled groups of participants to come together and effectively and productively communicate and solve problems. The approaches used fostered communication, partnership development and democracy through processes of negotiation, partnership building, conflict resolution and gaining the ability to realise needs and deal with differences. The

approaches used to support group growth took place over an extended period of time, at the individual level, at the group level and at the community level, as well as between groups, sub-catchments and catchments.

In group growth I found that methods focused on supporting the individual or a group of participants according to their needs provided them with a foundation that enabled effective participation in IWRM. The methods used in Phase Three included negotiation, identifying overlapping needs, dialogue, workshops, forum theatre and focus groups. The approaches used included creating platforms for negotiation, dialogue and building a working culture of respect and foresight. It was also important to ensure that the team of grassroots facilitators and I had dialogued with participants to ascertain their needs and objectives. In this, it was necessary to develop strategies that were tailored to relevant needs, which required adapting methods and trialing new methods based on listening and acting upon what the group needed. It was found that when participants were bolstered by a sense of self-respect, this facilitated a sense of personal power and the motivation to participate in the development of WUA and CF structures.

At this stage of a their group evolution, participants involved in the research had the following characteristics (after Pretty and Frank, 2000):

- **Participants gain a sense of independence** - for example, the WUA steering committee started to arrange their own internal meetings to discuss the WUA constitution without the help of the research activities.
- **Participants discover emerging capabilities** - for example, the marginalised communities realised that they had the confidence and knowledge to interact with government and commercial participants and negotiate their needs and ensure their needs were reflected in the WUA constitution.
- **Participants are able to look inwards and embrace their own identities** - for example, the marginalised groups identified strategies that enabled them to participate in catchment-based workshops. They did this by ensuring that their selected community representatives had necessary skills and enthusiasm to understand and communicate their specific needs at the WUA open meetings and workshops.
- **Participants are able to develop their own rules and norms** - for example the drafting of the WUA constitution involved much discussion to develop a document that prescribed the functions, management and voting system that was deemed to be representative and fair.
- **Participants begin to be able to look outwards and develop links with other groups** - for example, the Fairbairn community communicated regularly with Department of Public Works and MBB Engineering to build a partnership relationship for the low-level bridge.

- **Participants are able to diverge and develop individual characteristics** - the WUA decided that it was important that domestic water users were fairly represented on the WUA even though under the NWA WUA are primarily concerned with larger water users, such as irrigators and local water government providers.
- **Participants develop capacity to seek new solutions to existing problems** - for example the inclusion of community children to perform street dramas in a litter program conceptualised and organised by a commercial farmer in the Kat River Valley, in conjunction with the local Tourism Board. The farmer requested that the local children assist him in publicising a Pollution Awareness Day.

These findings are consistent with the characteristics identified by Pretty and Frank (2000) – suggesting that marginalised people in South Africa have a similar group evolution for IWRM to groups of participants in IWRM projects in other countries.

Although participants are more resilient once their group starts to grow, it is still possible that the group may break up once the original aim is achieved. For example, once the people from communities had chosen their CF representatives, all future workshops focussed on bringing the CF representatives of each village together and thus there was a danger that community participants in each village would fall away. This has happened as a representative participatory approach has emerged through the CF members and the management committee of the WUA. This is consistent with the increase in scale – where it becomes expensive and impractical to engage all stakeholders in all processes at a catchment scale. Equally, this change has increased the responsibility of representatives to communicate with their community constituency. This represents a shift from participatory to representative democracy.

These pointers provided tangible evidence of the participants' growing capacity and their ability to embrace and actualise their individual and group potential. It was here that I found that participants came to understand IWRM and feel confident to apply their knowledge. Some participants grasped concepts faster, more easily and more effectively than the grassroots facilitators and I and were capable of challenging proposed activities or solutions. I found that it was important for the grassroots facilitators and me to welcome and celebrate the participants' suggestions and not become defensive. This approach of acknowledging and appreciating participants' growth found that they were able to take charge of, comment on and contribute to the process. Therefore, this further demonstrated the importance for the team of grassroots facilitators and I to be flexible and shift away from the role of 'educator' as participants became increasingly able, discriminating and articulate.

9.7.6 Group Maturity - Co-Financing Catchment Activities

My research focused primarily on group initiation and group growth. Towards the end of my research, the participants were beginning to move into a position of group maturity, becoming decision-makers and playing a formative role in their sub-catchment. Stakeholders committed themselves to establishing and investing their human resources (time, skills) in the WUA and CF. For example, the grassroots worker from the community committed his time, financial and knowledge resources to continue CF functions as described above. In addition, DWAF began to operate as a participant as well as stakeholder by committing both human and financial resources to ensure a fair and well run process to elect members for the Management Committee of the WUA.

At this stage of the evolution the methods focussed on strengthening participants' capacity to invest and participate in the social, political and financial dimensions of IWRM on a broader scale. For example, with the bridge building to allow Jerry Ntsebeza and the Fairbairn community began to take over more roles and responsibilities so that it was 'they' who were negotiating with the outside agents and not the team of grassroots facilitators and me. I found that it was necessary to adopt approaches that would lead to effective participation and enable the community to flourish and own the IWRM processes. Therefore, I found that it was equally important that the team of grassroots facilitators and I avoided the temptation to occupy 'centre stage' and dominate the process.

I learnt that it was necessary to appreciate that for participants to adopt and implement IWRM behaviour they needed to approach other people and organisations. Effecting changes within participants necessarily affects the way they interact with others. For example, the Fairbairn participants, having become empowered and motivated by the process of capacity building, sought to engage wholeheartedly with the Department of Public Works and MBB Engineering. I learnt that during the group growth stage of their evolution, I should have started preparing Fairbairn participants to develop strategies for implementation and group maturity, including preparing them for setbacks caused by delayed funding or lack of support for proposed projects. Managing expectations in this way was not done as effectively as it could have been.

Some of the set backs for the participants to reach maturity were the delays experienced in ratifying the WUA constitution. This was highlighted by the experience of Jerry Ntsebeza (2001):

Often there was mistrust of community capacity, which required the community and I to show the outside stakeholders that we were capable and able partners in development. The community and the practitioner have to acknowledge and realise their fear to work directly with us as a community, thereby we as the community had to take a very active role in showing Departments

and not through the practitioner. In doing so, the community and practitioner decided that this active role required me to write letters, visit and phone continuously until the outsider stakeholder felt confident to work directly with us, the community.

A final, and critical point in capacity building was that the research process on its own did not have sufficient resources and objectives to deliver real solutions or resources to support implementation of on-ground works.

Once the activities for this thesis research ended, there were additional activities initiated, including an advanced educational awareness program, to support the Reserve Determination process for the Kat River Valley (a process under the NWA which enables a catchment community to determine the desired environmental quality of their river and hence what environmental flow should be reserved to ensure that quality). There was also an activity to support the voting process to elect members of the WUA. However, these additional activities did not have links to problem solving actions and were not able to address the priority needs of the community identified at the Stakeholders' Workshop in 1999. However, these activities did reinforce the value of building capacity of students such as Alistair McMaster so that they could continue supporting community initiatives with specialist skills and technical assistance.

On reflection IWRM projects must work towards action if IWRM outcomes are to be achieved. That action must involve all stakeholders including, if necessary, other government departments such as NDA, Land Affairs and Environmental Affairs. This recognises that IWRM outcomes, and other overlapping stakeholders needs, can only be achieved by implementation of on-ground works or changes in daily water resource management behaviour. Capacity building processes are a means to that end, but are not an end in themselves.

9.8 Conclusions and Reflections

In this section I reflect on core themes and principles that enabled the diverse stakeholder to prioritise catchment issues, participate in planning actions and take a meaningful role in IWRM in the Kat River Valley.

9.8.1 Reflections on the Core Themes and Principles

My research found that stakeholder participation in IWRM “does not happen on its own. It has to be made to happen” (Mascarenhas, 1998, p. 69). Key to the Phase Three research was the need to enable diverse participant groups to confidently enter into a range of situations, allow them to actively engage in negotiating agreements and solutions, and enable them to take over as many activities as possible.

The research relied on the participatory approaches taken to involve participants and enabled them to develop a sense of ownership and facilitate their involvement in IWRM. The participatory approaches enabled capacity building through: growing trust and respect; encouraging responsibility; facing and dealing with conflict; celebrating success; creating strategies and encouraging flexibility. It was also found that in every instance, the ability of the participants grew and their capacity evolved. Further, the participants' growth paralleled the growth of the team of grassroots facilitators and my confidence in the use of approaches and with participatory research (as shown schematically in Figure 1-1). The points below reflect on the lessons learnt in Phase Three and how they impacted on the approaches taken to involve participants in IWRM.

The Diversity of Participants

In Phase Three my research included Xhosa, 'coloured', and 'white' community groups in the Kat River Valley as well as DWAF staff. These were participants from different cultural backgrounds with stark differences in education, beliefs and expectations. It was important that the process of capacity building was not aimed at making participants become the same. Participants have different life stories, events, issues, concerns, ambitions and needs. My research identified that the development of capacity for IWRM should not be concerned with homogenising participant groups, but with enabling them to appreciate other standpoints and not to conceive of a view, a perspective or an action of another gender, caste, socio-economic group, age, or culture as lesser than their own. An acknowledgment of difference is not discriminatory, but the viewing of one group as superior to another is.

My research recognised that differences can lead to stresses and strains in IWRM as participants' capacities are hidden and not acknowledged. The research found that what is required are integrative structures with a high level of versatility and flexibility that can acknowledge both differences and similarities.

Planning, Designing and Implementing an Adaptable Program

Phase Two of this research recognised the importance for participants to be part of the planning, design and implementation of an IWRM program. In Phase Three, I found that it was important to ensure that the program and needs of the participants were continually negotiated with an acceptance that what is planned today might need to be changed tomorrow, or that elements such as the agenda for community meetings and workshops cannot be cast in stone. Therefore, I needed to learn to be open and willing to hear new ideas and diverse opinions, and have the creativity, understanding and commitment to accept change and revise the program where necessary. I found that the changing program required the team of grassroots facilitators, administrators, outside facilitators and me to be efficient in coping with the workload.

Creativity Helps Build Capacity

In Phase Two I focussed on building and understanding methods. In Phase Three I came to realise that it was important for the team of grassroots facilitators and me not to get stuck in a rut and use the same method repetitively. However, I found that it was important not to simply employ 'creative methods', because if these were not underpinned by relevance, flexibility and dynamism, even 'creative methods' would have become formulaic. As found in Chapter Eight, variety and creativity allowed concepts to be seen from different angles.

Integration into a Group

Integration of participants into a group with a common knowledge was found to be key to the research. In Phase Two I brought together the villages of Fairbairn and Hertzog to break down divisions and build a sense of partnership. In Phase Three this theme was central to the KRVP as IWRM relies on the development of partnerships between all participants. I found that building partnerships is a complex undertaking and must, therefore, be integrated into the process from the very beginning. However, I learnt that the groundwork for integration must be comprehensive and inclusive. Different activities focusing on different ages, genders and races relied on different methods. For example an activity aimed at marginalised groups used forum theatre to gain confidence in negotiation and an understanding in IWRM concepts. Another activity aimed at non - marginalised groups used one to one discussions on IWRM concepts. These separate actions started to contribute to IWRM when they were integrated together and focused on the objective of ensuring their ability to participate effectively in IWRM. The integrative process is about building community ownership, creating in participants a feeling of ownership and involvement and of allowing each participant to discover a point of interest with a sense of accountability.

Responsibility

In Phase Two I began to understand the importance of participants taking responsibility and sharing the tasks. With the research shifting to a catchment focus I needed more support and input from participants to undertake tasks because of the increasing scale of the stakeholder community and the landscape in which the research was taking place. I found in Phase Three that responsibility provided stimulus for the participants to redefine how they see themselves and their roles. My research found that participants who were allowed to take responsibility felt less confused, ashamed and discouraged because they owned the process, actions and decisions through their participation. The experience of the KRVP showed that as soon as participants became responsible, more often than not, they wanted to learn, have a say, understand the process, and became more accountable and became partners (Motteux, 2001).

The Necessity of Participants Internalising Information

The Phase Three research identified that a key to bringing about a catchment scale IWRM activity was to ensure that participants had a good understanding of the information so that informed decisions could be made. Therefore, due to the scale of catchment-wide activities I found that it was important to set in place the mechanisms that allowed participants to gain access to information. For example, the team of grassroots facilitators spent time in each village and made regular phone calls to key participants.

The Role of the Researcher

My research noted the importance of taking the process of reflection seriously and to incorporate it into the process (for example after the environmental awareness workshop participants reflected on the process). I found that in a catchment-scale research project participants need to be actively involved in the evaluation process to help guide the research and expose causes of successes and failures in the research. However, I failed to set up participatory monitoring and evaluation (PM&E) indicators in collaboration with participants. These indicators would have laid out standards at the onset to accountably indicate the efficiency, cost-effectiveness and appropriateness of the inputs, outputs, outcomes and agreed goals (Fargher, 1996).

Celebrating and Reflecting on the Participants' Journey

My research in Phase Three found that the act of reflection and celebration is an integral part of sustainable IWRM. Success stories gave participants courage and confidence because their effort to bring about change was recognised. Reflection gauged whether the work was on the right path by investigating whether the participants had achieved their goals and whether they were fulfilling the negotiated needs.

Raising Self-Esteem and Self-Confidence

In Chapter Six and Eight my research found that environmental concerns are part of life and are associated with a wide range of human feelings such as apathy, rebellion, hate, anger, threat, confidence and failure. Building confidence was identified as a salient factor for those that had been previously discriminated against. In Phase Three I paid attention to raising the self-esteem and self-confidence of participants to enable them to understand their position, have a voice and feel accepted. A key finding of Phase Three was that participants needed the skills and confidence to enable them to articulate their issues and needs otherwise the outside researcher will remain responsible for negotiating priorities on behalf of the community, and the stakeholders will have been consulted rather than actively participated. Thus it is vital that the stakeholders are developed so that they become independent of the researcher.

My research found that capacity building therefore, needed to be centred on the challenge of working with internal issues (such as apathy, rebellion, hate, and anger) and allowing participants to find their own ways of coping, seeking options, solutions and a way forward. Capacity building enables participants to attain autonomy, and it is this internalised autonomy that allows participants to proficiently engage with IWRM issues. Capacity building to review internal aspects was not a once-off exercise; it was continuous exploration that unfolded until the participants felt strongly about the issue at hand, and felt a sense of ownership of the transformation or change.

9.8.2 Summary

The absence of set guidelines and structures for CF limited the potential engagement of local and external stakeholders. Even where legal frameworks or guidelines do exist, such as for WUA, local stakeholders felt ill-equipped to enter into this kind of process. Thus, a lack of awareness among local stakeholders of their rights and responsibilities, coupled with a lack of capacity at higher levels, can make any attempt to form CF and WUA ineffectual and unsustainable. The reality ‘on the ground’ is that previously marginalised stakeholders are rarely able, or equipped to participate in CF or WUA without early support. It is for this reason that the KRVP efforts to strengthen local stakeholder capacity were paramount in order to realise IWRM through CF or WUA. Given the historical backdrop against which IWRM work takes place, it is vital to acknowledge that building capacity in marginalised peoples is a sensitive and dynamic process. Thus, there are no formulas for success, nor are there any quick fixes. The importance of the researcher’s role in building the capacity of local stakeholders is crucial. The importance of the evolutionary path ending in tangible outcomes or solutions that address stakeholder needs, which overlap with IWRM needs is critical to effective participation.

All those involved learnt lessons, evolved their capacity, listened, struggled, changed and developed. This happened as each participant acknowledged and embraced feelings around issues such as lack of confidence, entitlements to water and resources, language barriers, racism, ageism and sexism.

Building participants’ capacity and the emergence of a strong participants group is vital for the sustainability of IWRM. The research identified an evolutionary process, in which capacity building took place at every point on the progression. The evolution was found to involve the following changes in the three stage process schematically represented in Figure 9-1:

- **In the first stage**, participants, usually at the individual or household level, became aware of their position, rights and responsibilities. This gave them confidence to participate in open discussions with fellow participants and wider stakeholder groups to form a group. During the first stage previously marginalised people moved towards having a say and realising the need for a structure.

- **In the second stage**, participants came together with their local and newly acquired knowledge in order to negotiate and find common ground. This articulation and sharing of knowledge allowed a shift to occur that led to motivation for a representative structure.
- **In the third stage**, participants worked together with ability, confidence and the necessary knowledge in order to implement an agreed framework with accountability and responsibility.

Phase Three of the thesis research contributed to the achievement of a number of IWRM outcomes in the Kat River Valley, many of which are evolving further as a result of stakeholder actions. IWRM outcomes to which the thesis research contributed include:

- formation of a legally constituted WUA – the Kat River Valley Water Users Association;
- formation of an active CF – the Kat River Valley Catchment Forum;
- construction of a low-level bridge at Fairbairn;
- completion of a Kat River Valley IWRM Action Plan and maps for use by funders and others interested in supporting IWRM activities in the Kat River Valley;
- a team of skilled grassroots facilitators who have been contracted by other projects to provide various participatory process services;
- establishment of effective working relationships between DWAF and other stakeholders;
- establishment of effective working relationships between marginalised farmers and commercial farmers in the Kat River Valley;
- establishment of effective relationships between catchment stakeholders and Rhodes University;
- contribution of expert advice to DWAF and WRC for national guidelines on CF formation; and
- preparation of guidelines on participatory processes for IWRM in South Africa for WRC.

10 Reflections and Lessons Learnt

10.1 Introduction

Apartheid excluded rural communities in the former homelands from involvement in river and water resource management issues – they were not consulted and they did not participate. The political reform that swept South Africa in 1994 included Water Law reform. Integrated Water Resource Management (IWRM) emerged as an important cornerstone of the present national policy on water resource management. The National Water Act (NWA No 36 of 1998) has been hailed around the world as a visionary piece of legislation. Consistent with international best practice at the time, the NWA provides for institutional frameworks to enable catchment stakeholders to become actively involved in the management of riverine and water resources. However, implementing this legislation is a huge challenge for South Africa because of the financial, knowledge and human resources needed to effectively implement integrated water resource management in a participatory and sustainable way.

This research investigation commenced with a focus on riverine resources and evolved, as the South African policy setting matured, to focus on IWRM. The focus on water resource management rather than catchment management reflects the institutional setting in South Africa, consistent with many other countries, where water and land resources are the responsibility of separate ministries. The research objectives and aims were developed in response to the emerging needs for participatory processes to support implementation of the NWA as it evolved during the research period. The research actively sought to enable marginalised people to participate in IWRM through exploring appropriate public participation methods. The research strived towards employing participatory philosophy and ethics to ensure a self-critical mode that promotes accountability through constant reflection by the researcher and methods. The lessons and learning from this research are currently being drawn on by WRC to establish participatory IWRM guidelines for South African practitioners (WRC, in press).

In this chapter I reflect on the key findings from the research and relate them back to the original aims and objectives of the thesis. I also review the research in relation to its aims and objectives and present the contributions made to theory and guiding philosophy. I then identify the key lessons and reflections derived from the aims of the research. These are presented as recommendations and key findings for government institutions such as DWAF as well as community organisations such as WUAs and CFs. The findings also have broader international applicability.

The process of achieving the objectives and aims of the research evolved over a six-year period. The research process was one of discovery, personal development, learning-by-doing, and co-learning with

community and institutional participants. During the six year research period, international and national policy frameworks for riverine and water resource management changed, and the practical needs for implementation of the National Water Act became clearer. This is shown schematically in Figure 1-1 in the introduction to this thesis. It shows that as I adopted participatory principles and methods, the participating stakeholders became part of the research and became willing to build their capacity in order to achieve IWRM outcomes.

Key research findings that contribute to specific suggestions in respect of national IWRM policy, DWAF operations, programs and future research are noted. The theoretical and methodological research contributions were identified through the research process, through exploring the literature on participatory philosophy and methods, trialing these methods, and through reflection with community and institutional participants in the research activities.

As I come to the conclusion of my thesis, the participants in this research continue to be actively involved in IWRM. The capacity and institutions built during the implementation of the research have enabled participants to become real actors in IWRM for the Kat River Valley. The establishment of the WUA and CF, as well as the construction of the bridge at Fairbairn described in Chapter Nine, were all completed after the end of the research, but are evidence of benefits derived by those who participated in the research, and of how the process of empowerment developed a momentum of its own as a result of successful participatory engagement. In addition, the Catchment Research Group based in the Geography Department of Rhodes University continues to conduct research in the Kat River Valley. Therefore, this chapter does not stand as a final conclusion of research in the Kat River Valley, but it is a conclusion to my own activities there. This chapter presents these conclusions from my research experience.

10.2 Key Lessons Derived from the Aims of the Research

In this section I explore the key lessons and reflections derived from the aims of the research. The research aims were separated into three parts that are detailed below, with an explanation of how I addressed them:

- to understand and establish the local participants' local knowledge, community's structures and attitude's to the riverine environment through the administration of surveys in Fairbairn and Hertzog in 1996 (as described in Chapter Six) and environmental awareness workshops (as described in Chapters Eight & Nine);
- to facilitate local participation in IWRM through a process of capacity building, focus group discussions, collectively raising awareness, identification of concerns and debating actions (as described in Chapters Eight and Nine); and

- to explore and understand the practices and principles of development that facilitate local participants in IWRM through reflecting on the methods, orientation and findings in the six year research process (as reflected on in Chapters Six to Nine).

Eight key lessons emerged that were essential for bringing marginalised groups into IWRM. No one lesson can be excluded from the process nor is one more important than the other. Each lesson incorporates different elements of the aims of the research. These lessons are intended to be for researchers and practitioners who, according to the NWA, have the task of adopting methods to build the capabilities of stakeholders to become active partners in water resource management. The lessons are also relevant to a wider audience of IWRM practitioners including those working with developing communities and indigenous people in other countries. These key lessons listed below form the basis of this chapter in which I present my practical, methodological and theoretical findings, namely the need for:

- well-conceptualised aims;
- appropriate orientation and ecological paradigm;
- adaptation of participatory methods so that they are appropriate to the needs of diverse stakeholders at local and catchment scales;
- comprehending the multiplicity of influences impacting on the achievement of outcomes;
- implementing sustainable resource management at the catchment-scale;
- building capacity;
- the researcher and team to have clearly defined roles and responsibilities; and
- outputs and outcomes.

My research also demonstrated a practical application of participatory theory to IWRM which took into account the overlapping needs of institutional and community stakeholders.

10.2.1 Well-Conceptualised Aims

My research found that the aims of research into riverine and water resource management need to: be developed with participants; meet overlapping needs of the researcher and participants; be understood by participants and those working on the research; be frequently restated and be clear to prevent haphazard planning. These lessons address the aim that sought to explore and understand the practices and principles of development that facilitates local participants in riverine and water resource management. In addition, these lessons provide practical insight into the application of participatory methods.

The aims of this research (see Chapter One) were directed from outside by academic and research funding institutions. I found that participants found it hard to understand, participate and own the process because these aims were imposed from outside. However, I learned that it was possible to engage participants in planning processes that enabled them to learn what the research aims meant, to identify where their needs overlapped with these aims, and to develop a plan for implementation of the research that met both their needs and those of the researcher. It was only in the second year of the research that a collaborative plan and approach to water resource management was developed with participants from the Fairbairn and Hertzog communities (see Chapter Eight). In developing the direction that achievement of the research aims was to take, the plan addressed the needs of the communities and the aims of my research. The plan evolved through ongoing consultations with participants, incorporating direct needs that overlapped with my research aims. These overlapping needs included effective communication networks, better catchment integration, more awareness of the environment and an understanding of the NWA. All of these needs were addressed in a spirit of learning and dialogue (see Chapters Eight and Nine).

I also found that well understood and negotiated plans to achieve research aims created a satisfactory foundation for organisational consistency, greater efficacy and flexibility to participants' needs. The overall aim needed to be acknowledged by participants and by me – ideally participants should have been involved with the design of the research aims for this thesis. However, given that these were already set, I was able to involve participants in decisions surrounding implementation of the research to achieve those aims. In so doing, this enabled participating stakeholders to orientate themselves to the research goal and move collectively in the same direction - hence increasing the potential for riverine and water resource management. The process of collective acknowledgment and co-learning was realised through continual open dialogue and negotiation in the creation of, and reflecting upon, the aims and consequent implementation plan. I found that in participatory research, such a plan was needed as a guide but this needed to be tempered by sensitivity, openness and flexibility to ensure that the process is truly people-centred.

Diverse stakeholders, local communities, government agencies and their staff, and fellow researchers participated in my research. Therefore, it was important for the aims of the research to meet the overlapping needs of the diverse participants. This was done through building up a framework of needs with the diverse stakeholder so that they could find a common standpoint and unity at all levels of the research. Using overlapping needs provided the basis for a long-term relationship between community and institutional stakeholders (such as DWAF). It also allowed for differences in social and economic status, cultural backgrounds, race and gender, as well as differences arising from divergent expectations to be accounted for and negotiated. Overlapping interests laid the basis for local participants to develop a

carefully considered, coherent IWRM plan and goal. My research found that the practice of identifying overlapping needs between potential participants and the researcher is a key to arriving at solutions that address the priority needs of stakeholders. Therefore, I found that determination of overlapping needs should be included into the suite of participatory thinking and practices.

My research found that it was common for priority needs identified by the community to have a direct link with IWRM, even though they did not always perceive such linkages. For example, gastric health issues could often be related to water collection and animal husbandry practices along the river. Changing poor grazing practices (the cause) was a means of addressing gastric ill-health (the symptom) and the riparian zone could be better managed as an outcome. Therefore, I found that riverine and water resource management research should facilitate and enable participants at each distinct step to review their needs as well as their progress.

When I approached participants with the intention of setting in place riverine and water resource management processes, I found that it was imperative to openly discuss motives and desired outcomes. I found that this should take place within the communities and also within the research institution itself as well as between the team. Also, at the start of a workshop it was important to recall the aims of the research or task at hand to avoid participants having false expectations of the research and hence preventing frustration occurring.

I found that it was important not to exclude educated and wealthy socio-economic groups from riverine and water resource management research despite the priority need to address the needs of those most impacted by apartheid. This recognised that the educated and wealthy have IWRM needs that affect their livelihoods, well being and empowerment. This is especially so in a nation such as South Africa where apartheid damaged all groups, fostering breaks in communication and a focus on differences, and consequently splitting groups apart.

My research led me to identify one note of caution: if research aims do not meet the needs of stakeholders then it may be necessary for the researcher to work with other stakeholders or spend time building their capacity so that they can understand them. This is one of the risks of participation - the researcher does not have full control and may need to adapt or move elsewhere if local participants are unwilling to collaborate or the researcher is unwilling to change. In the research for this thesis I changed my orientation and research plan in order to achieve the original research aims whilst also meeting some of the needs of participants in the Kat River Valley. This was an important lesson.

10.2.2 Appropriate Orientation and the Ecological Paradigm

My research found that appropriate orientation and the choice of ecological paradigm were central to facilitating effective local participation in riverine and water resource management. In this section, I explore the influence of the orientation and ecological paradigm on the research in approaching the aim of the thesis.

The Influence of Orientation

Looking back at my research, I realise that it commenced in the dominant orientation, even though I wanted it to be located within a participatory orientation, drawing specifically on Participatory Rural Appraisal (PRA). As shown schematically in Figure 10-1, my research evolved from a dominant to a participatory orientation and from an anthropocentric to an eco-centric ecological paradigm.

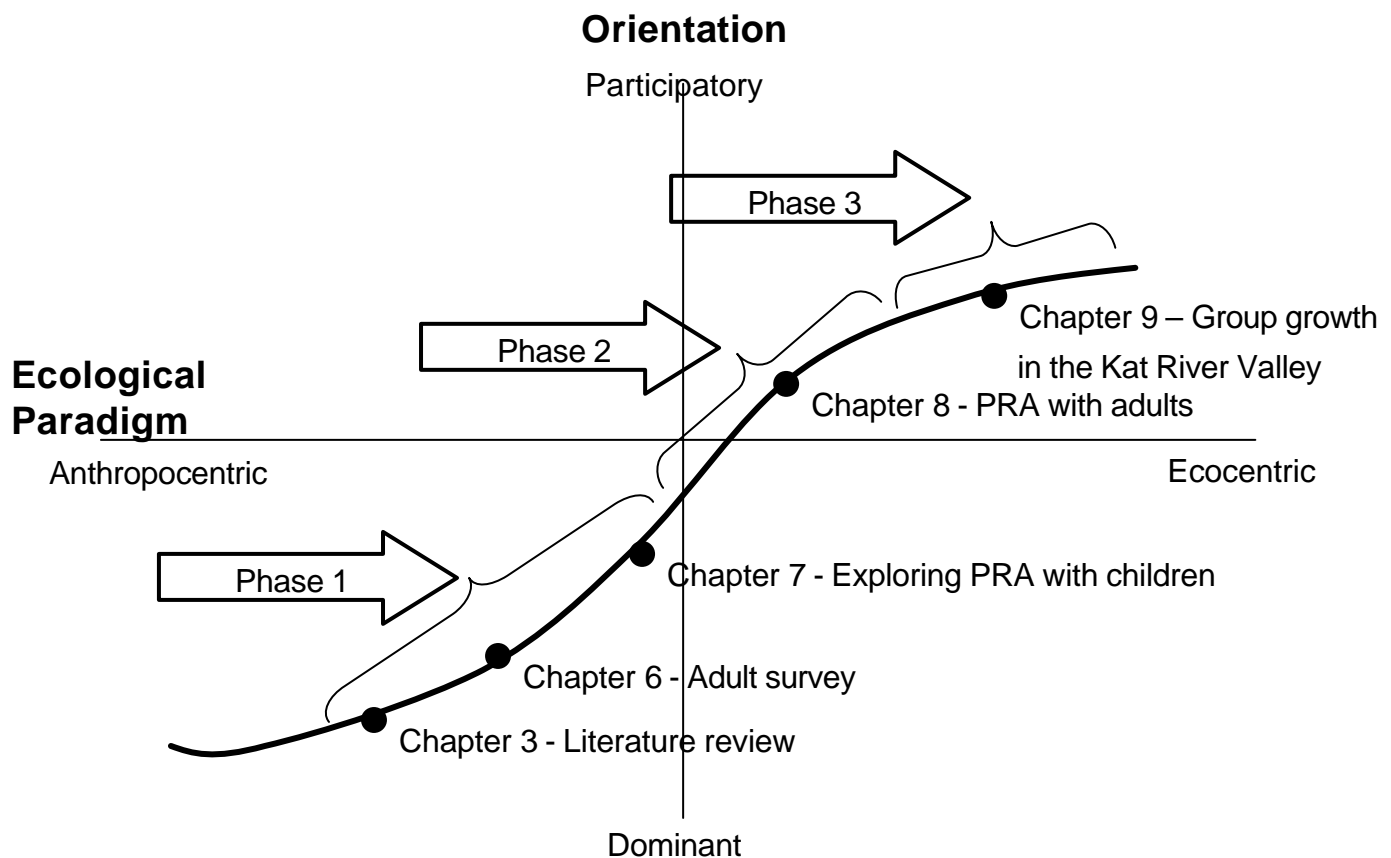


Figure 10-1 : Evolution of the Research Orientation and Ecological Paradigm

The orientation referred to in the schematic figure is that explained in Chapters Three and Four. It is within an orientation that a research question is framed, objectives are selected and particular methods of data-collection and methods of analysis are applied.

Through my research, I found that participatory and dominant assumptions are in sharp contrast (see Chapter Four). It was found that the aim, methods and outcomes of the research are guided and

influenced by the orientation chosen and adopted. The best intentions in the world to seek participatory outcomes are no protection against producing work that is not empowering and does not enable change in the way people manage water resources in their day to day lives. In fact, participatory tools can still be applied in a top-down manner, as demonstrated in Table 4-1. It is for these reasons that I found it vital to give careful consideration to the philosophical orientation that underpins the research. I became aware of this in the initial research phase, when my goal to work towards having local groups of people befitting and learning with and from the research was not initially achieved as the research was embedded within the dominant orientation (See Chapter Six & Seven). Therefore, as the orientation underpins and shapes the research journey, I found that it is important for participatory research to be framed and guided by participatory assumptions.

In my research journey, the methodological assumptions implicit in the participatory orientation provided a helpful and constructive foundation to review my plans, thoughts, actions and outputs. For example, when planning activities to work with the community to establish the WUA and CF, the assumptions of the participatory orientation helped me to let go and leave most of the decision making to participants. I did not need to own the voting process or the name or boundaries relating to the WUA. My role was first to empower and then to facilitate conflict resolution and processes such as workshops and negotiations to enable participants to reach consensus on these important components of the WUA. This had several positive outcomes: I came to internalise the assumptions so that I could work with confidence and knowledge and it helped me make decisions. It also helped me to monitor and improve my research; it focussed and provided a foundation for my research; errors were seen as opportunities to learn from with acknowledgment of culpability and responsibility; and it accentuated accountability and commitment to the stakeholders. I found that self-reflection is essential for effective participatory work.

The Influence of the Ecological Paradigm

The ecological paradigm in Figure 10-1 refers to the relationship between the participants and their ecosystem. An anthropocentric ecological paradigm is one in which participants view the ecosystem as a resource to meet their immediate needs – it is a paradigm focussed on tangible use values and the present generation. An eco-centric ecological paradigm is one in which participants view the ecosystem as a resource to be shared with other species and future generations – it is a paradigm focussed on intangible existence values and future generations of human and other species.

Figure 10-1 shows how my research evolved from an anthropocentric ecological paradigm and dominant orientation in Phase One to an eco-centric ecological paradigm and participatory orientation in Phase Three. In Phase One, through the adult survey (see Chapter Six), and work with the children (see Chapter Seven), I found that the motivation of participants for environmental protection was

anthropocentric. Their focus was resources to meet their immediate needs and safeguarding public health, and protection of people's livestock – with few respondents recognising or articulating the need to preserve the environment for its aesthetic and cultural value, or for the benefit of future generations.

The evolution to an eco-centric ecological paradigm began in Phase Two (see Chapter Eight) when the participants' needs framed the approach to the research and enabled them to inform and direct the research work. Importantly, the NWA and its associated policies also influenced the research work as they were able to encourage participants to adopt an eco-centric ecological paradigm. In Phase Two, the rural people acknowledged their high degree of dependence on the natural resources and, through participatory approaches, they came to value the importance of managing their natural environment at the individual, household and catchment scale for current and future use.

10.2.3 Adaptation of Methods to Meet Needs of Diverse Stakeholders

To achieve my aim of partnership and participation through the research journey it was necessary for the research methods to evolve and adapt as the participants' capacity evolved and matured from awareness raising to group maturity. I found that it was possible to adapt participatory methods so that they were appropriate to the needs of diverse stakeholders at local and catchment scales. I found that the orientation of a researcher will influence the methods selected and how they are used. This has been highlighted through drawing upon an example of how a survey can be used in both a dominant and a participatory orientation (see Table 4-1). I present the three phases of my research process in order to demonstrate how methods were altered and influenced by my shifting orientation. My findings show that the same method can be applied under different orientations with widely varying results.

The Influence of Orientation on Phase One Methods

In Phase One I made use of a survey as well as methods that could be called participatory, such as participant observation and transect walks, and living with the local people. The latter methods, though they are congruent with a participatory orientation, were embedded in and affected by the dominant orientation within which I was working at that time. The adoption of a dominant orientation was revealed by the aims of extracting information and the 'truth' from the participants about their past and present riverine knowledge and IWRM practices. In this, I also acted as the instrument of the research.

I had full ownership of each step, including designing the program, being responsible for collecting the data, analysing and reflecting on the findings, and ultimately presenting them. All of this excluded the community whom I consulted but did not allow to actually participate in the research. The methods I used were limited by my focus on collecting information for my thesis. The community had no control over, nor access to, this information in Phase One. There was no co-learning since my information was

never challenged. The dominant orientation that underpinned my work during this phase therefore curtailed the use and potential effectiveness of any participatory methods. This is in spite of the fact that such methods are expressly designed to mobilise participants to question and use their knowledge and skills to bring about change. In this phase I did not yet have insight into the influence of the dominant orientation on the methods I was trying to employ. Table 10-1 summarises this influence.

Table 10-1: Influence of the Dominant Orientation on Methods Used in Phase 1

	Phase One Method and Approaches
What is being sought?	Collection of standardised data in order to gain an indication of the characteristics of Hertzog and Fairbairn respondents' knowledge, past and current behaviour, and their attitudes and beliefs concerning riverine management. This standardised data was understood to provide an answer or truth that was quantifiable and able to be generalised to the broader national scale.
How is it being sought?	The research was conducted, conceptualised and directed primarily through the researcher. Limiting my input to merely probing sought to diminish my influence to that of an interviewer.
How is it understood?	The purpose of collecting data was, firstly, to inform my thesis and, secondly, to provide verifiable information for broader policy, conferences and Water Resource managers.
Methods used:	Structured surveys, informal interviews, living with local people, participant observation, transect walks, mental mapping, setting tasks, brainstorming, recording, group discussions.

The Influence of Orientation on Phase Two Methods

The methods used in Phase Two were influenced and shaped by the principles of PRA, Theatre for Development and the policy and regulatory changes in the NWA. In this phase I began to appreciate the necessity of not merely applying methods, but of understanding and internalising principles. Thus Phase Two was a transition for me between dominant and participatory orientations. This led to the insight that the researcher is accountable to participants because the researcher is first accountable to the principles of participation. Using this realisation as a foundation enabled me to embrace the responsibility inherent in Chambers' (1992a) observation that participatory approaches place an emphasis on the behaviour and attitudes of the researcher in their engagement with participants. Within this process, self-reflection is crucial. It was through reflection that I was able to find the courage to interrogate my situation and methods of working, and to use interactive methods such as drama alongside standard PRA methods

such as mental mapping, transect walks and group discussions. Using an eclectic set of methods does not imply that arbitrary or unstructured work is acceptable. On the contrary, methods have to be carefully selected in order to match the objective of the exercise, the needs of the participants and the extent of the resources available.

My shift towards working within a participatory orientation opened up the research process to the rural people with whom I was working. This enabled both the participants and me to acknowledge and negotiate our overlapping needs, roles and responsibilities. It was at this point that I began to experience a tension between striving towards true participation with the community, and the necessary demands of my thesis. Despite the fact that the community and I had agreed together on a plan and way forward to achieve the research aims, I felt that my academic work was in conflict with participatory thinking. Table 10-2 indicates the uneasy co-existence of two orientations in this phase of my research.

The Influence of Orientation on Phase Three Methods

In Phase Three, a deeper understanding of the principles of the participatory orientation heavily influenced the methods I used. Thus my work drew on thinking from Action Research and Theatre for Development (see Chapter Four). The methods used were calculated to actively support both capacity building and implementation of on-ground works (for example tree planting, building the new bridge) even though my research and resources precluded material investment in such works. This required raising awareness of IWRM using local and expert knowledge, encouraging stakeholders to take an active part in IWRM practices, and building links between local and government stakeholders – especially DWAF. These methods necessarily required integrating very diverse groups of people and thus needed to take into account the history of the area, the feelings of the stakeholders, the timing, the needs of the environment and my own research aims and objectives. The fact that the Fairbairn bridge was constructed and the WUA and CF were established (see Chapter Nine) is evidence that the methods used in Phase 3 were effective despite the limited resources available from my research program to materially support these activities.

The increased complexity of issues dealt with in Phase Three allowed me to experience, become aware of, and start to understand some of the trends linked to encouraging disadvantaged people to participate actively in IWRM. This learning was possible because of the six year duration of the research and because I could repeat the use of similar methods in different circumstances. Being able to observe trends clarified for me the importance of understanding what it is that methods are being used to achieve, and that any methods have to be understood in relation to broader issues including capacity, management, and the needs of the participants, and the researcher. Furthermore, the work in this phase enabled the

realisation that method is influenced not only by orientation, but also by the political, social and cultural context of the area, the participants and the research itself. Table 10-3 summarises this influence.

Table 10-2 : The Influence of Orientation on Methods Used in Phase 2

	Phase Two Methods and Approaches
What is being sought?	A shift by the people of Hertzog and Fairbairn to identify overlapping needs (See Chapter 4), such as the need to work together, to explore and challenge concepts of IWRM at the community level. At the same time, both parties (i.e., the researcher and the participants) became open about their different needs. For example, my need for data for my thesis including local knowledge of IWRM and understanding how to bring local people into IWRM, and the participants' need for information regarding IWRM in order to effect positive change.
How is it being sought?	Joint action and sharing of roles and responsibilities in knowledge construction between community people and myself.
How is it understood?	For participants, the information provided a basis upon which to bring about change through sharing and understanding participants' lives, skills, needs, wants and fears. The joint action provided me with a basis upon which I could start interacting with local people and begin to learn how to bring participants into IWRM, thus informing my thesis. However, I still felt required to collect detailed information from participants for my own use, and to seek a 'single truth' by comparing local and scientific knowledge
Methods used:	Meetings, dialogues, group discussions, transect walks, mental mapping, forum theatre, image theatre, story-telling, data recording, feedback, warm-ups, joint planning, sharing responsibilities, community workshops, and regular reflection.

Table 10-3 : Influence of Participatory Orientation on Methods Used in Phase 3

	Phase Three Methods and Approaches
What is being sought?	Respecting and valuing multi-truths enabled the research process to be inclusive of all racial groups, language groups, levels of literacy, religions, resource levels and a range of capacity needs. To build the knowledge, skills and confidence capacity of all stakeholders, including the practitioners and co-workers in order to enable effective participation in IWRM. Responding to the personal, political and cultural needs of stakeholders and establishing links between local catchment people and other stakeholders such as DWAF, bulk water service providers and other government departments.
How is it being sought?	The conceptualisation of the research and production of knowledge was continually negotiated with participants as the process evolved. The stakeholders, funders and I guided the focus of the work. Acknowledgment of the influences, biases, roles and power of all participants.
How is it understood?	<p>The tension experienced with regard to collecting information for the thesis lessened. This came about as the participants and I came to an understanding that, in order to fulfil my professional role, we all needed to grasp complex and interwoven concepts underpinning the methods. We also had to accept why such concepts were important and what their impact was on outcomes. This reflection proved to be crucial as the research broadened into other areas in the catchment: I needed to understand what I was proffering, thinking, saying and doing and why. Through reflection the participants and I came to acknowledge that the only thing that we could control was our own behaviour and that we should use the opportunity of working together to understand first-hand what is required to become involved in IWRM.</p> <p>My deeper understanding of the broader aspects of the work enabled construction of knowledge through collection of information to be shared with local stakeholders more efficiently and effectively and, thus, bring about change. The knowledge borne of these efforts fed directly into developing national policy on enabling disadvantaged groups to participate in IWRM. Further, I ensured that this learning was made available to IWRM practitioners throughout South Africa for comment and discussion.</p>
Methods used?	Meetings, dialogue, group discussions, transect walks, mental mapping, forum theatre, image theatre, story-telling, data recording for booklets, feedback, warm-ups, newsletters, brochure, team work, participatory monitoring and investment plans.

I learnt about the influence of orientation on the effectiveness of method was of great significance to me personally and to my research findings generally. I found that a method can be applied in either

orientation, and that the orientation will influence its effectiveness. For example, I learnt that a questionnaire is not always inappropriate in participatory work simply on the basis of it being a method that is traditionally used within the dominant orientation for purely extractive, quantitative purposes. To demonstrate this Table 10-4 presents the survey method used in Phase One (as detailed in Chapter Six) in a dominant orientation and contrasts that with the survey method requested by Hertzog and Fairbairn participants and used in Phase Three (as detailed in Chapter Nine) in a participatory orientation.

Table 10-4 : Dominant vs Participatory Use of a Survey

Modes of Working	Dominant Orientation	Participatory Orientation
What is being sought:	A single truth.	Many truths.
How is it being sought:	By a neutral, detached observer.	By an inevitably subjective co-learner.
How is it understood:	Provides information solely for the researcher.	Provides information for the community and the researcher in order to elicit change.
Design and implementation	Researcher controls all elements of the research process. Designing and planning is conducted off-site. Implementation is controlled by the researcher.	Researcher and community work together to uncover whether the method is appropriate and how it should be structured. Local people are trained to complement the role of 'researcher' by supporting administration of the survey and interpretation of results with the facilitation of the researcher.
Use of questionnaire	Interpretation and use are controlled by the researcher.	Interpretation and use is shared by community and researcher
Results	Policy, report or book outputs, often unseen by community	Policy, report or book outputs co-developed with community

The comparison presented in Table 10-4 demonstrates one of my research findings – that any methods can be used in either a dominant or participatory orientation. This research finding emphasises that it is not methods that made my work participatory or not, but rather the orientation that underpinned how I used the method.

Lessons and Reflections on Methods Used

This section provides a reflection on findings concerned with the aim of this research that sought to understand and explore the means by which to encourage marginalised groups to actively participate in IWRM. The efforts were realised through methods that built stakeholder capacity and confidence. The aim or goal should shape fieldwork methods, rather than the methods dictating the process. I learnt to acknowledge that tools were a means to an end, not an end in themselves, and that processes are never 'completed' - rather, they are always dynamic and frequently cyclical.

The methods used ranged from working in-groups to working at the individual level. Methods were used and chosen with a specific task to achieve, such as to stimulate thinking, encourage debate and view alternative solutions. I found that no method guarantees participation and, as diverse participants learn in different ways, methods needed to be targeted and adapted to meet the needs of each situation. The following reflections evolved over the research journey as a result of continuous appraisals of my mistakes, digressions, achievements, hopes and desires throughout all phases of the research. The key lessons relating to methods resulting from my research journey that are relevant to facilitating community development in IWRM include:

- Grasping a thorough understanding of the conceptualisation of a method enables the method's full potential to be realised, providing the practitioner with a greater ability to enhance capacity building, sustainability and the full involvement of participants.
- In choosing methods, the researcher and the community participants need to understand together who the project is for, its time limit and budget, as well as the level of literacy required. This is to ensure that appropriate methods are chosen in terms of effectiveness, efficiency and relevance to the agreed tasks. For example, participants might guide which aspects should appear in a program while the practitioner uses her/his skills to design a flexible and well thought-out structure for the agreed program.
- It is vital that methods are flexible and are fluid processes with a concrete goal. The methods should be shaped by the end goal rather than the methods dictating the manner of achieving it.
- It was found that no process undertaken is the same each time. The context in which the researcher works necessarily obliges the researcher to be innovative and to adapt methods and use alternative modes of articulation and interaction. Each context needs to be understood and engaged with openness, so that methods can be implemented flexibly and within the spirit of participatory principles. A less flexible approach tends to lead to linear, simplistic applications of the methods for the sake of 'ticking off a step'. Unquestioning and non-adaptive use of handbooks is also problematic. An appropriate application of method should stimulate and challenge both the

participants and the practitioner. It is in such a manner that methods allow participants to review their situation, understand it, question it, seek alternatives, and recognise trends and cyclical behaviour.

- The methods should be planned with the participants, and not framed solely by the researcher.
- It is the researcher's responsibility to reflect on effectiveness constantly and to actively involve the community of participants in this reflection process. Where necessary, the chosen methods must be adapted to meet changing needs or evolving capacity. This ensures that the methods will remain appropriate to the overlapping needs negotiated between participants and the researcher.
- The journeys that lead towards building capacity (for the researchers as well as the participants) will inevitably have stumbling blocks and digressions. It is less important not to fail, than to be open to acknowledging one's mistakes and being flexible enough to change. Such self-reflectivity and humility can provide lessons of enormous value for all concerned.
- Drama can be used to: raise awareness, transfer information, convey a complex set of messages inherent in IWRM, give local participants a voice, find strategies and alternatives, break the ice, encourage two-way communication and set the scene. Drama is helpful across a wide spectrum of ages, professions and cultures, and with both genders.
- To ensure that participants can understand and engage in the dramas and PRA exercises it is important for these tools to be relevant and linked to the participants' context, i.e., their local knowledge, culture and life situations.
- A key characteristic of participatory approaches is the need to work together in a way that encourages a shift of focus from the individual to the collective. It highlights the importance of using consensus-building methods and identifying overlapping needs as the basis for progress towards positive change. There is, however, an attendant danger that within this emphasis researchers may lapse into viewing communities as homogenous units. This is inappropriate and counterproductive as differences are both real and valid (Highwater, 1981).
- Participatory methods are intended to lay a foundation to encourage and implement change. Continuous reflection and support from all parties should underpin this process. Change is hard and methods need to nourish and grow capacity in those leading it.
- An effective, appropriate and formal management system is vital. This need is often disregarded as it is thought to smack of authoritarianism.
- All plans require a human, financial and technological investment that must be assessed to allow the participants to become and remain an inclusive part of the process.

Based on the lessons outlined above, my research does not identify a particular preferred method or methods that are most appropriate for riverine and water resource management in South Africa. All the methods trialled in my research were effective and have a place in IWRM. The decision about when and

how to use these methods depends on the capacity of the participants and how far their group and other institutional relationships have evolved. This reinforces my methodological contribution about the need to use a suite of methods for effective participation of communities in IWRM.

10.2.4 Comprehending the Multiplicity of Influences to Achieve Outcomes

This section draws on the research aims presented in Section 1.4 that sought to understand how a community functions in relation to IWRM, including community structures, local knowledge, attitudes and needs. I explore the practical application of participatory theory to IWRM that takes account of local knowledge, perceptions, and socio-economic and cultural structures. My research findings highlight the importance of comprehending both the local as well as the external influences on participants.

Understanding and Acknowledging the Context of the Research

My research set out initially to analyse and understand community structures and relationships as they related to riverine management and environmental awareness. I found that the methods and approach used needed to take account of regional history, the stakeholders, the timing with respect to local, national and international needs and issues, the existing policy frameworks, the orientation and the ecological paradigm of the researcher and participants. All of these factors are highly variable. I found that these factors need to be explored and understood in the planning and implementation of research as they impact on it both directly and indirectly. My research found that the operating environment in which research and participatory activities were being planned and conducted were influenced by: the NWA and the evolving policy framework for water resource management, the evolving transition of the former Ciskei to being an integral part of the Republic of South Africa, and the emerging power structures in the post apartheid South Africa. It was important to acknowledge the context and the many conflicting forces of politics, history and culture and socio-economic considerations that constantly influence the decisions people make in their daily lives. Researchers need to acknowledge that research cannot be separated from these contexts.

Financial Considerations

In my research into local community structures I learnt that financial resources have a great influence on IWRM outcomes. In terms of grass-roots workers particularly, I learnt that it was crucial that the research process was run with resources at a level similar to which they would normally have access to in the long term. This is essential for sustainability if activities are to continue after research or project funding terminates. If grassroots training is based on expensive resources and infrastructure, there is a risk that the worker may develop networks based on these and not know how to deal with the 'normal' situation which will return when funding ends.

Conflict in IWRM

In the journey towards IWRM, my experience was that conflict was inevitable. I found that this was not necessarily a negative influence, because conflict offers opportunities for growth, reconciliation and change. This was vital in terms of the demands placed on local participants by the NWA. In dealing with conflict and negotiation, I found that researchers need to ascertain their own strengths and weaknesses, and should, if need be, call on outside assistance. Also, researchers in the negotiation must have a sound knowledge and appreciation of the different participants' community structures, local knowledge and needs regarding natural resources.

Participatory Style of Management

My research finding of understanding the boarder development practices found that the style and process of undertaking management in IWRM was crucial to the research's success. I found that an open, flexible, democratic, decentralised, participatory style of management allowed participants to take ownership of the research process and outputs. Professionalism needs to be high on the agenda I came to believe that participants deserve nothing less. I also learnt that participatory IWRM research requires effective leadership in order to realise innovations, guide the process and inspire participants towards agreed goals. Such leadership, however, was found not to be authoritarian or hierarchical. In fact, the complexity and volume of work characteristic of a IWRM research prohibits attempts to manage people in that way.

Chambers (1994a) constantly points to the danger of "sloppy, biased, rushed and non-self-critical work" (p. 2). Fowler (1997) states that this danger occurs due to the assumptions that community work is easy and since the recipients of the work have no basis for comparison, professional standards need not be a chief consideration. Such attitudes, naturally, result in low standards of professionalism. Instead, a participatory orientation towards implementing my research required me to use self-reflection and be critical of my power and skills so that they could be utilised responsibly and effectively. This required me not to generate unrealistic expectations and to know what I could bring to the project in terms of skills, resources and finances. If I agreed to undertake a task, I was committed to do it professionally and in a manner that assured that the local people understood it.

Broader Policy Influences on the Research

The research activities found that in establishing the potential for riverine management in rural communities it is important to consider the influence of IWRM policy. I found that as my research took place during the time that the IWRM policy and debates were taking place, the research had to encompass uncertainty and possible surprise changes. Due to evolving debates concerning national water resource

reform I found that honesty was important to ensure that participants did not expect the research process or facilitator to provide the answers and to ensure that IWRM strategies developed by participants were:

- continually dialogued with relevant Government agencies (DWAF) to check if they had developed any broader frameworks and to ensure the direction of the research matched government policy and evolving regulatory regimes;
- representative of the local needs;
- forward looking to move participants towards seeking unity, accountability and an ability to review and reflect; and
- well conceptualised so that participants and researchers understood why they did things and appreciated that the process would not provide an immediate solution and needed long-term social, human and financial investment.

10.2.5 Linking Local and Catchment Scales for IWRM

The activities conducted in the research for the thesis evolved from local (Phase One) to catchment (Phase Three) scales. The experiences presented in Chapters Six to Nine and the lessons learned presented in this chapter demonstrate that participatory methods can be adapted to bring together diverse stakeholders at the catchment scale as well as at a regional scale.

At a local scale, as the experiences in Fairbairn and Hertzog during Phase One demonstrate, methods can be applied with all community members. PRA and survey methods worked well at this scale but the participants were strongly focused in the anthropocentric ecological paradigm, as shown schematically in Figure 10-1. At the local scale, it was difficult for participants to understand IWRM or to identify where their needs overlapped with the needs of IWRM without a broader spatial and social context.

When this broader context was introduced, through PRA and Theatre for Development methods (see Chapters Seven and Eight) and environmental awareness activities associated with the Kat River Valley Project (see Chapter Nine) participants began to understand cause and effect relationships in the riverine environment. Their focus evolved from an anthropocentric to an eco-centric ecological paradigm – as demonstrated by their willingness to participate in activities that had catchment-scale impacts but limited local impacts.

The importance of scale and linking local needs with the broader spatial context, especially the catchment scale for IWRM, became a central theme for capacity building and action planning activities, as detailed in Chapter Nine.

10.2.6 Building Capacity

My research highlights capacity building as a vital component of IWRM practices and principles that need to acknowledge community structures and local knowledge. I found that capacity building was an integral part of every effort in working towards developing IWRM. The research experience clearly demonstrates that capacity building influences every part of the evolution towards effective IWRM.

In understanding community structures and local knowledge I found that in the case of the poor and the disadvantaged, who were typically vulnerable and disheartened, participation did not take place automatically. I learnt that participants need support to have their capacity built in order for them to be able to participate usefully and constructively in the process and to be empowered by it to bring about changes in their lives. My research found that capacity building was a method of development since effective participation resulted in participants taking charge of their rights, as well as owning and shaping the water resource management decisions that affect their lives. Supporting community development through capacity building activities required me to evolve to focus on strengthening and enabling participants' to participate in institutional and negotiation arrangements that were new to them. My research and the role I had in the KRVP enabled participants to participate in a range of activities such as negotiations relating to the allocation of resources to meet their water needs, the planning and designing of CF and WUA programs and networking with various groups of stakeholders.

Capacity building required the researcher to see and appreciate participants as equal human beings and collaborators in the research. I realised that I had certain capacities and skills which enabled me to do some tasks better than the participants. However, I learnt that by letting go, when appropriate, participants could also demonstrate capacities and skills that enabled them to do some tasks better than I could.

True capacity building was found to be a process embedded in self-reflection, for the participants and me. Capacity building creatively enables co-learning and creation of a representative place of that enables participants to observe, to perceive who they are, discover who they are not, and imagine possible actions and outcomes. Capacity building activities should encourage the role playing of different perspectives to imagine varying actions and to explore alternatives. My research found that capacity building is centred on the stakeholder, and it is the stakeholder who enters into negotiations and discussions concerning catchment management. In this sense the participatory processes facilitate change in and by the participants. The facilitator has to let go and not own the outcome of the process.

In order to enable participants to take on responsibility, responsibility had to be given to them. Although training courses and attendance at conferences does build capacity, I found it important not to limit

capacity building to discreet events such as these. I learnt that it is important that capacity is built in context and with ongoing support. In particular, it was necessary to manage expectations by ensuring that participants had sufficient capacity to predict the likely reality in which they would be working. An example of the fruits of building capacity is the experience of the Fairbairn member of the grassroots team of facilitators, Jerry Ntsebeza, who gained valuable hands-on experience in negotiating through his participation in the research. Through this, he gained confidence and skills. Thus, when he was faced with a situation in which he, as a Kat River Valley representative, was responsible for negotiating with the Department of Public Works, Jerry Ntsebeza was able to conduct himself with confidence and self-assurance. This allowed him to achieve a working relationship with the Department that helped lead to the upgrading of the bridge. Throughout this his expectations were informed by the realities of government authority and community poverty. If Jerry Ntsebeza had merely been exposed to negotiation skills at a Training Workshop, for example, and had not had the constant and day-to-day experience in research activities, it is very likely that he would not have been as able to effectively present his case in such a demanding situation. It is unlikely that every participant could have their capacity built to the same extent as Jerry, because resource limitations would normally preclude that. Jerry was selected by the community to be a leader in IWRM and his standing both as an individual and as a leader within the community made it appropriate to build Jerry's capacity so that he could continue to support others after the research ended. This "train-the trainer" approach is commonly used in community development processes and is also relevant to IWRM.

Capacity building in IWRM must also take place within the context of national change. The NWA sets out clearly that enabling human and environmental rights within a democracy is an essential part of the capacity building process. This is intended to assist in creating a platform on which different participants may collaborate to combat the injustices caused by apartheid. Variations in education, wealth, lifestyles and values necessitated different participants receiving support in different ways to enable all participants to participate effectively and efficiently in IWRM.

My research identified guiding principles for capacity building in IWRM work. Many of these guiding principles are consistent with the findings of other researchers, for example Chambers (1992a), Chambers (1994a) and Fowler (1997). The capacity building principles that are relevant to IWRM in South Africa are that capacity building:

- is about the person and therefore necessitates the researcher being able to see and appreciate participants as human beings;
- is centred on the stakeholder, and it is the stakeholder who enters into negotiations and discussions concerning catchment management;
- is about seeing the person as an 'equal' human being, and not perpetuating power imbalances;

- is about creating a space that enables stakeholders to observe, to perceive what they are, discover what they are not, and imagine outcomes and possible actions;
- enhances participants' local, collective and self-knowledge and should provide a platform upon which stakeholders can visualise, dramatise and reflect on the situation from different angles and viewpoints;
- should encourage the understanding of different perspectives to imagine varying actions and to explore alternatives;
- allows needs to be identified, providing a foundation on which to build sustainable IWRM;
- gives stakeholders autonomy to express and own their needs;
- strengthens each persons and groups' confidence, ability to speak and ability to be responsible and accountable;
- enables stakeholders to gain awareness, develop and mature as participants in IWRM;
- allows stakeholders to grapple with and understand important IWRM issues, to the point that they become 'common knowledge';
- engenders knowledge, skills and improved attitudes and encourages change in individual and organisational behaviour;
- allows stakeholders to come to terms with their past and embrace their future;
- is rooted in a celebration of differences, in that each participant brings different skills, worldviews and knowledge to the unfolding process;
- helps break down divisions of tribe, race, gender and age through integration and promotes trust and respect amongst stakeholders who have traditionally viewed each other with mistrust;
- enables confidence to carry out an action, whether it be taking a decision that affects IWRM functions or taking part in informal discussions;
- enables stakeholders to come together and make decisions about IWRM that affect their lives and their catchment;
- allows stakeholders to own, design and implement IWRM processes and functions;
- allows stakeholders to be actively involved in the process of finding their monitoring and evaluating indicators; and
- involves celebrating successes and milestones.

10.2.7 Roles and Responsibilities of the Researcher

In this section I make a practical contribution to the development of research principles and practices for future research. In facilitating IWRM with participants, the researcher needs to be professional, self-reflective and willing to learn. My experience also allowed me to identify the different roles and responsibilities that a researcher in IWRM is likely to encounter.

I found that IWRM work required me to have a large store of courage and resilience. It was also vital for me to be aware that I was an integral part of the process. I found that I needed to strive towards professionalism. In fact, consistent with the broader development principles and practices of IWRM research, professionalism was found to be non-negotiable and I learnt that I needed to drive toward quality work and commitment to the principles and tools of participatory work.

In understanding the potential for riverine management I became increasingly aware of the risk that I could slip into the role of the ‘oppressor’: one who takes and does not give, one who fails to negotiate or recognise that oppressed people may agree to undertake a task without questioning because of feelings of inadequacy. In addition, the many physical and psychological disorders in the community required me to search for methods that could address feelings of hopelessness, subordination and demoralisation. I sought methods to stimulate participants to feel good about themselves and to take charge of their circumstances. My research did not actively address the medical and mental illnesses in the community, but in understanding them as a ‘symptom’ of abandonment and a lack of development, I sought to ensure that the research activities were stimulating, empowering and participatory, with the ultimate aim of enabling active participation in IWRM.

I also learnt that the effective participation of communities takes time and requires significant resources. It takes time to establish relationships that will endure for a long time and that will result in sustainable change within a community. Capacity building and planning activities, as well as the implementation of IWRM works, must be accommodated within the already busy schedules of participants – who for the most part have limited time for discretionary activities.

I found that my effectiveness relied heavily on my competence and willingness to learn and reflect. Learning processes are never ‘completed’, rather, they are always dynamic and cyclical. I found the core principles of PRA and AR to be of great benefit: namely the need to practice continuous reflection on behaviour and engage in a process of reversal, which sought for self-accountability and self-improvement. I also learnt that it was unrealistic and obstructive to hold onto fantasies of doing everything correctly, all the time. My journey inevitably had stumbling blocks and digressions. It was less important not to fail than to openly acknowledge mistakes and be flexible enough to change. Self-reflection and humility provided lessons of enormous value to me. Lessons learned were even more valuable when they were shared with participants. In practice, the participants were able to evaluate my professional behaviour and this contributed to both my research and stakeholder relationships.

My research findings also have relevance to future research practices. The lessons learned suggest that strong interpersonal skills, a well-developed sense of integrity, and the ability to mobilise resources,

ensure that stakeholder participation occurs and in so doing enhance sustainability. I would suggest that inexperienced and indifferent researchers directly affect the quality of the process and often revert to superior and “colonial” attitudes embedded in the dominant orientation. In addition, my research emphasises that the skills of a team and the researcher impact on the ability of the participants to achieve their IWRM objectives and outputs. Lastly it is crucial that participants flourish and own the IWRM processes. It is equally important that researchers and other practitioners avoid the temptation to occupying ‘centre stage’ and divert the process to meet their own framework of interest.

The lessons presented above came through practical implementation of methods. This experience resulted in practical findings that may be useful to practitioners in South Africa and other places. It was found that the following practical processes on the part of the researcher were crucial for effective stakeholder participation:

- Providing a non-threatening venue, supplying stationary for people who would not be able to afford it so that they can record the progress and their needs; assisting with travel arrangements; simplifying complex information and ensuring it is made available in local languages.
- Ensuring that stakeholders are invited, informed of the meeting or workshop agenda and, if necessary, providing a capacity building process prior to the meeting.
- Ensuring that transparency and honesty characterise the process.
- Negotiating roles and responsibilities and the need to undertake them professionally.
- Supporting all groups equally so that they all have choices.
- Ensuring that participants feel that they have been listened to, supported and are in capable and professional hands.
- Ensuring the facilitator has appropriate skill, knowledge and confidence.
- Understanding local customs and circumstance and speaking local languages.
- Ensuring information is obtainable, sufficient and accessible so that participants can participate meaningfully with trust and understanding.
- Ensuring that awareness-creation, capacity building and education underpins the entire evolution of IWRM.
- Ensuring constant feedback to participants.
- Understanding the long-term goal of the research and acknowledge that the short-term activities towards the goal are not set in concrete.
- Ensuring that the participatory research produces tangible and sustainable IWRM outcomes.

10.2.8 Outcomes (Long Term Changes) and Outputs (Short Term Changes)

My findings highlight that the objective of IWRM research should be to enable sustainable integrated water resource management (IWRM). This can only be realised through community processes not being limited to processes of capacity building and consultation but also designed to ensure that participants become active partners with negotiated roles and responsibilities to implement practical activities on the ground. The end result of such evolution must always be action if IWRM outcomes are to be achieved. Sustainability requires that participants celebrate tangible IWRM outcomes (long term changes such as implementation of sustainable grazing practices to reduce erosion or improved water quality) and IWRM outputs (short term changes such as establishment of a WUA or raised awareness about the impact of erosion on water quality) relating to sustainable water resource management.

Although the research aims did not focus on practical changes in the way participants managed water resources, this aspect deserves mention. In hindsight the research aims and objectives would have been more effective if they had formed the first stage of a project designed to support implementation of improved water resource management practices with resources for activities on the ground such as improve grazing practices, re-vegetation and erosion measures. In this it must be noted that the bridge built in Fairbairn addressed the symptoms of poor riverine management rather than the causes. However, the capacity building process of stakeholders participating in the bridge project enabled them to better understand both catchment-scale water resource issues and ways they could modify their water resource management behaviour to improve the health of the riparian zone. My research suffered from not having a tangible outcome that was directly relevant to local communities – something that they could ultimately implement. Many of the on-going activities were process orientated and lacked attention to technical skills and research that could have enabled participants to take charge of their development. The outcomes (long term changes) and outputs (short-term changes) from my research journey included:

- **Outcomes** - a bridge over the causeway of the Kat River; motivation for ‘Planting Tree Project’; building of a community hall; computer course; a grassroot’s team member attended a year-long Environmental Education course; a Green Trust Award from Nedbank.
- **Outputs** - capacity building, local and expert knowledge on IWRM, environmental and catchment awareness, GIS datasets for WUA and CF, integration between stakeholders, development of a CF and a WUA; link between children and adults; enthusiasm.

The process-orientated research that dominates most IWRM work (that is the development of institutional structures, Reserve Determination processes, and environmental education) neglects the building of skills for environmental management on the ground. I found that implementing action on the ground is a key need for marginalised groups of people who want to improve their livelihoods. My

research showed that effective IWRM should incorporate and work towards outcomes that focus on changes in how people manage catchment and riparian resources, and how communities as a whole perceive and behave towards water resources. My experience was that this requires scientific, social, economic and technical expertise as many grassroots communities have lost their local knowledge and skills to confidently implement actions on the ground. I learnt that the shift to implementation using external expertise needs to be developed with local participants and take into consideration the local, regional and national context, culture and local needs. In addition, I recognised the importance of sustainability to address future needs.

I found that without a focus on environmental outputs that improve sustainable livelihoods, IWRM research had little long-term benefit. If this does not happen, participants may be further marginalised, become despondent and, in fact, be worse off after they have invested their time and commitment to the process of empowerment and the creation of capacity. Thus I learnt that process orientated research should be rooted in on-ground-works. Also, the separation of process aspects of projects from implementation activities may result in costly research as instead of one project covering all aspects of IWRM there could be up to three or more projects.

My research activities and participation in DWAF and WRC activities outside the thesis research emphasises that South Africa still has a focus on participatory processes as the end, rather than the means to an end focussed on IWRM.

10.3 Key Lessons Derived from the Objectives of the Research

The research process and results detailed in the preceding chapters reveal several important findings in terms of the original objectives of the thesis. These are presented below by objective.

10.3.1 To Assess the Ecological and Habitat Integrity

The scientific work conducted with community participants and specialist scientists identified that the ecological and habitat integrity of the Kat River was threatened by changed flow patterns, unsustainable farming and grazing practices and over-exploitation of riparian zone resources. At the same time surveys of community participants identified a wide range of values associated with the riparian zone and the river catchment – ranging from resources that could be extracted to aesthetic and spiritual values.

I found that I did not have the necessary technical skills to fully complete the ecological and habitat assessment. My finding was that IWRM requires multi-disciplinary teams and that community participation and empowerment activities normally require the focus of one specialist team member, whilst others contribute specialist scientific and economic skills. Accordingly, it is important for research teams to include people with good technical skills.

A knowledge of environmental science and investment economics was needed to enable activities with community participants to shift from a focus on participatory planning and other processes to implementing activities on the ground such as best management farming practices, erosion control measures, re-vegetating and sustainable tree harvesting systems as well as enabling sustainable local economic development. These practical activities need to be designed with a good knowledge of natural resources in order for them to be consistent with IWRM principles. This scientific or technical knowledge was found to be important as marginalised groups of people claimed, in the baseline survey in 1996 and subsequent environmental workshops, that they did not have the practical knowledge or confidence in their local knowledge to implement activities on the ground. Technical assistance is therefore integral to effective participation in IWRM, but for it to be effective people need the capacity to seek and engage with it.

Failure to achieve the initial ecological and habitat assessment objective highlighted that the absence of a practical end point and the lack of integrated scientific, social and economic objectives and aims were a shortcoming of this research. Because it was not connected to an expressed overlapping need, the assessment of ecological and habitat integrity had little meaning for participants. Many of the needs of marginalised people were connected to improving their livelihoods, such as wind breaks or more productive and sustainable farming practices. In this case the research objective had less overlap with the priority needs of the community participants. This also highlights the difficulty that researchers face in their type of work compared with those planning and implementing development projects.

10.3.2 To Utilise Community Sensitive, People-Centred Methodologies that will Lead to the Empowerment of the Community and Allow for Applied Outcomes

During the research I trialled a wide range of participatory methods with participants of widely varying ages, capacity and cultural backgrounds. Some of these trials were unsuccessful, but most were successful – demonstrating that participatory methods can be adapted and applied in South Africa for the management of the riparian zone and IWRM. As outlined in the previous section, the research focus was not focussed on meeting overlapping needs of community participants. This prevented full testing of the methods, and highlights the importance of participatory activities being mutually beneficial. However, the work towards establishment of IWRM institutions in the Kat River Valley – the CF and WUA – was an overlapping need of participants in the research and resulted in an applied outcome.

My participatory research found that it is important to draw on a suite of participatory methods such as Action Research, PRA and Theatre for Development. Such a suite of methods enabled stakeholders to

build their capacity and to solve their problems by collectively sharing information, combining outside and local knowledge, analysing, planning and evaluating – that is learning through the process. A suite of methods is also needed to service participants as they evolve – both as individuals and as a group.

My research found that working within a people-centred philosophy is not as simple as bringing stakeholders together to talk. I found that participation is very different, and much more demanding, than consultation. It is work that is deeply rooted in philosophy and ethics. In this, it is crucial that researchers and practitioners constantly reflect on their work and methods, to ensure a healthy, self-critical mode that promotes accountability and continuous improvement.

10.3.3 To Ensure the Adaptation of Participatory Research Techniques (PRA) to the South African Context

As outlined in Chapters Seven through to Nine, participatory methods can be effectively adapted to the local context if participants are actively engaged from the beginning. The use of a grassroots team of facilitators ensured that participatory principles and methods were adapted to meet local needs. My overall finding was that most of the methods are sufficiently generic to require little adaptation to the local context. In other words, if they are applied in a participatory orientation, these participatory methods can be readily adapted to the South African context and to IWRM in South Africa specifically.

I found that participatory approaches need to be tailored to each group to ensure that they feel comfortable with the process. For example, the work with children and village adults required a different set of methods to those used for work with a mixed group of community representatives, commercial farmers and DWA staff. Differences in social and economic status, cultural backgrounds, race, gender and divergent expectations are commonly cited as the reasons for raising ‘walls’ between people, which create and exacerbate conflict. I found that it is crucial for participatory approaches to encourage the breaking down of ‘walls’, and allowing stakeholders to use their differences for mutual growth and the solution of real problems they face in everyday life. This is especially relevant for IWRM in South Africa where the NWA calls for a new approach to water allocation, cost sharing and resource management. There is a suite of participatory methods, concerned with awareness raising, conflict resolution, negotiation, capacity building, investment planning and knowledge sharing, that can be adapted to the South African context to actively involve stakeholders in the management of their water resources.

I also found that participatory methods need to be tailored to match the capacity of participating stakeholders. As the capacity of participants evolves, so must the methods – hence the need for a suite of methods. From my findings I conclude that researchers should ensure that the participatory methods correspond to the stakeholders growing capacity and their ability to embrace and actualise their individual

and group potential. This is important as the researchers need to be absolutely committed to enabling local stakeholders to reach a mature and evolved level of group growth so as to effectively implement water resource management activities. In the early to middle stages of the evolution process, stakeholders are likely to fulfil only consultative and decision-making functions. With increasing maturity, however, they are equally likely to be able to enter into contractual or devolved relationships with DWAF and CMA and implement on the ground works.

10.3.4 Assessing Riverine Values and Perceptions of the Adults and Youth

To analyse and understand how the adults' and the youths' local knowledge, attitudes, needs and community structures affect the riparian zone within their local and surrounding environment

The participatory approaches used in Phase Two and Three enabled the stakeholders to collectively examine their local knowledge and assess it. As detailed in Chapters Eight and Nine, participatory methods enabled stakeholders' to recognise that the break down in their cultural knowledge and their low self-esteem meant that they had no local knowledge of practical use in the management of the riparian zone or IWRM. The forced changes over the past 50 years resulted in the failure of local water resource management knowledge and actions in many local communities. I found that before they participated in the research activities the communities were characterised by anthropocentric attitudes towards the riparian zone in their local and surrounding environment. Their focus was on what they could extract from the riparian zone. The participatory methods used demonstrated that community participants did not lack commitment to learn or bring about change. The research found that if community participants are given the opportunity to examine their situation, make decisions, build their capabilities and not become dependent on outside assistance, they can shift their attitudes and behaviour towards an eco-centric approach to the riparian zone in their local and surrounding environment.

To determine the degree to which the adults and youth are concerned to look after or even to improve the state of the river for their immediate use and for the use of future generations

My finding for this objective is similar to the findings for the one above. Before they participated in activities to raise their awareness and build their capacity to manage the riparian zone and water resources, participants had limited and anthropocentric concerns relating to the state of the river. Water quality was their primary concern, but participants felt that they were powerless to influence this and so were despondent about initiatives to improve the state of the river for their immediate use, let alone for the use of future generations.

I found that when participants were empowered with an understanding of catchment-scale processes and evidence of the impact that their behaviour is having on the state of the river for their immediate use and

for the use of future generations, stakeholders do shift their attitudes towards riparian zone management. However, their capacity to adopt behavioural change is limited by access to other resources such as money, skills and equipment. For example, participants from Fairbairn worked together to negotiate a bridge crossing to solve problems caused by the changed flow regime in the Kat River. They had identified this need long ago but lacked the capacity to organise themselves and articulate their needs to government authorities prior to my work with them. Participants were willing to build their capacity and work towards addressing symptoms of riverine and water resource degradation. However, the causes of degradation were often not apparent to participants, and being less tangible it was more difficult to engage them with activities focussed on causes rather than symptoms.

To compare the adults' and youths' local knowledge with `western' scientific knowledge

My research found that local knowledge has largely been destroyed as a result of recent history. The notion of local knowledge, as espoused by some western scientists, was found to be a romantic one in the Kat River Valley. As such, the major finding of my research relating to this objective is that local knowledge is unlikely to provide stakeholders with the capacity to manage the riparian zone in this location. Indeed, the real need is for effective communication of western scientific knowledge in a form that can be applied to the practical solution of everyday problems facing these stakeholders. This is where participatory methods and technical assistance can be integrated to achieve IWRM – adaptation and communication of scientific knowledge using participatory methods.

Another finding was the distinction between local knowledge and culture. As detailed in Chapter Six, the participants in this research had lost their local knowledge, but they retained their cultural heritage, which could be used to add value to IWRM. For example, the cultural respect for elders provides an opportunity for using this group of participants as a vehicle for introducing changes. These cultural dimensions were important in the adaptation of participatory methods to the local context.

To establish the adults' and youths' understanding of water law and their attitude towards water regulation

As demonstrated in Chapters Six and Nine, my research found that all stakeholders – commercial water users, potential water users, local government, and provincial DWAF staff - had a limited understanding of the NWA and the policy environment in which DWAF operates. This was a result of the recent establishment of the NWA and the distance between the centre of debate (ie DWAF in Pretoria and King Williams Town) and communities of water users. My research found that bringing DWAF and other stakeholders together, for example through using participatory methods and theatre for development, enabled effective communication, empowerment and the development of a sense of ownership and partnership between institutional and community stakeholders. Once community stakeholders understood

opportunities available to them under the NWA, they actively sought participation in both CF and WUA. Another finding was that with capacity building and open engagement there is very little that formerly marginalised communities cannot do if there are resources available to support implementation.

To enable the adults and youths to critically review and evaluate their actions and effects on the riparian environment

My research highlighted that stakeholders need to be motivated and encouraged to take part in water resource management through researchers or practitioners creating opportunities to build capacity and enable meaningful participation in practical activities. The participatory approaches outlined in Chapters 8 and 9 enabled stakeholders to work together on tasks to assess their water resource values and perceptions. The interactive process of learning and negotiation enabled them to identify and collectively become aware of the threats and opportunities presented by water resource management. The suite of tools used, ranging from focus groups (small group dynamic methods), to transect walks and forum theatre, enabled stakeholders to see the advantages of cooperating in order to identify priority problems, prepare plans to address them, and implement IWRM activities to solve them.

Employing a team of grassroots facilitators was an effective method of enabling strong commitment, enthusiasm and understanding of IWRM to ensure that the needs of the marginalised communities were represented and understood in regional forums, as well as acting as the liaison person for implementation. The team of grassroots facilitators had first hand knowledge of the local context and understood the personal motives of key community stakeholders. I found that this was integral to the success of the IWRM activities. It was critical for the grassroots team to be involved in all aspects of the IWRM activities, including presentation of findings to investors such as WRC to ensure that they gained ownership and confidence to continue supporting IWRM matters.

10.3.5 To Assess the Hertzog Primary School Childrens' Values, Perceptions, Solutions of the Community, River and the Surrounding Area

To undertake on-the-job training of volunteer community members in the principles of participatory learning and action in order to carry out carry out participatory research in the school

During the research I conducted on-the-job training of co-workers initially participating in activities with school children (as detailed in Chapter Seven) and trained a team of grassroots facilitators (as detailed in Chapters Nine and Ten). The effectiveness of training local community members to become co-workers is clearly demonstrated by the different outcomes of the adult survey conducted in Phase One, where there were no trained co-workers, and the outcomes of Phase Two and Phase Three where there were trained co-workers.

My key finding relates to the sustainability of change resulting from participatory activities. Such activities need leadership and without local community members being willing and trained to take leadership positions, any change resulting from research activities will be unsustainable. This is demonstrated by the effectiveness of the team of grassroots facilitators, who have continued to work with communities in the Kat River Valley after the completion of my research. Having built their capacity and enabled them to lead, they are now used as a resource by other researchers and DWAF, as well as by the local communities. As such the outcomes of this objective exceed what was originally planned. The grassroots facilitators are trained in the principles and practices of participatory learning and action with a focus on research and on-ground action throughout the community, rather than just in the school as was initially planned.

Whilst undertaking on-the-job training of community members, I learnt that I had a responsibility to develop a culture of professionalism in trainees. For example, the female trainees from Hertzog who were chosen to work with the children arrived at work with troubles that effected their work. The two female trainees exhibited a silence that was embedded in their personal relationships, as well as in the broader gender relationship with the male trainee. I learnt that by not understanding these issues until much later, I had failed the trainees on a professional and human level. I applied this lesson with the team of grassroots facilitators in Phase Three to provide a space for the team to meet regularly, to reflect on their work and to constructively address their personal and professional issues. An example was understanding and grappling with the meaning of alcohol abuse. I found that whatever the problems facing trainees may be, they need to be addressed within the project. If they are not, they are inevitably reflected in the work and are thus become problems for participants – dishonest work, alcohol abuse, aggression etc – are foisted onto the participants for *them* to handle over and above those issues that are endemic to their own situation. This would, of course, entirely inappropriate.

Exercises for introductions, icebreakers, to improve listening and to encourage team work in a relaxed atmosphere

My research identified that exercises for introductions and icebreakers were important, as the children at the start were unsure and reserved. This resulted in them misunderstanding exercises - for example on day one, as described in Chapter Six, instead of drawing self-portraits they mostly drew objects. Therefore, even though the children did not always achieve the desired outputs of the introduction and ice breaker exercises, the exercises started to break down barriers between themselves, the trainees and me. Further, I found by repeating an icebreaker daily the children began to look forward to it and wanted to participate. For example, the diagramming exercise, which encouraged the children to verbally and visually present and reflect on what they had done, resulted in the children becoming eager and confident to contribute.

Understand the role of children within the broader community structures

I found that through using a suite of methods, ranging from mental maps to drama, I was able to develop a detailed account of the childrens' role in the broader community. This information enabled me to understand that the children viewed community life as an important feature of their existence. For example, their mental maps illustrated their perception that their households were linked to those of others. It also enabled me to understand that their lives were intrinsically linked to the environment in undertaking their daily chores. For example washing their clothes outside, collecting water, playing and interacting with their friends in their yards in the broader environment. Gaining this information enabled me to understand that children have a place in IWRM – both through impacting on water resources and through being active communicators and workers in the community. Therefore, I learned that whether participants are children, youth, adults or elders they all need to be responsible in different or overlapping areas, such as making decisions about keeping the river clean, and to be involved in debating priority issues such as litter programs. Since in this way IWRM is about everyone taking responsibility, capacity building needs to be extended to all participants.

To determine and understand the level of childrens' understanding of water uses and sources

I was able to cross check information that helped me understand childrens' understanding of water resources by using a variety of participatory methods, as described in Chapter Seven. By using mental maps, setting home work and through the water quality exercise undertaken jointly by the children and water expert, I gained a good knowledge of childrens' perceptions of different water sources and how their understanding of water quality varied. For example, they had a good knowledge of the different collection points in the area, including taps, boreholes and the Kat River. However, as the children used different water sources, their experiences and knowledge varied. Unlike children who used water from taps and tanks, those who collected from the Kat River took into account the quality of the water during their collection of water and therefore preferred to collect from deeper pools and observe any signs of poor water quality, including colour and smell.

To analyse and understand how the school children's local knowledge, attitudes and needs affect the riparian zone within their local and surrounding environment

I found that participating children had a good knowledge of water resources in close proximity to their communities. As described in Chapter Seven, participating children recorded accurate and detailed information on maps from memory, such as placing where the fields were, the bends in the river, the type of trees and vegetation along the river. This detailed knowledge was gained mostly through 'doing' – collecting water, going fishing and swimming. However, they did not have knowledge concerning the management and care of the riverine or water resources. Their knowledge was anthropocentric. It focussed on meeting their immediate needs and was not informed by local knowledge and traditions of environmental care.

To determine the degree to which children are concerned to look after or even to improve the state of the river for their immediate use and for the use of future generations

As explained above, my research found that participating children had anthropocentric concerns about the state of the river. They were interested in water quality and the availability of resources of immediate benefit to them such as fuel wood or fish. The children were interested in managing the riparian zone if it could benefit their immediate use of the river. However, before raising their awareness and building their capacity, they were less interested in looking after or improving the state of the river for future generations.

My research used a suite of participatory methods including transect walks, drawing, collective discussions and writing to raise the awareness and build the capacity of participating children so that they could understand the value of not just the water for consumptive use but also for environmental needs. This resulted in them beginning to identify 'good' and 'bad' actions in the environment and to grapple with the complexity of the tension between environmental management and their livelihood. For example, a weir is 'bad' as it stops environmental flows but 'good' for irrigation.

In the nine sessions I conducted with the children they were unable to identify solutions to bring about more sustainable riparian management. Standard PRA exercises did not assist participating children in making the transition from understanding their environment to thinking about possible ways to change it. At this point, I saw an opportunity to use role play to enable the children to actively take on the roles of environment and people in it so that they could physically and mentally feel the 'good' and 'bad' effects of environmental management. This was done in later work through using standard PRA in combination with Theatre for Development, which then enabled the children to engage with the solution and become active in environmental care (Motteux *et al.*, 1999).

To compare the children's local knowledge with 'western' scientific knowledge

My research found that participating children had a practical knowledge gained from learning by doing. This knowledge gave them skills and know-how to chop wood, make fires, and collect water. However, this knowledge had few linkages with scientific knowledge and did not extend to the implications of their actions on the environment. For example, children that collected water from the river knew that foul smelling water was likely to be bad for them to drink. However, they did not realise that some waterborne pathogens, such as *E. coli*, could be present without affecting the odour of the water. Nor did their knowledge give them the basis upon which they could identify harmful pathogens in the water.

The childrens' ethnic background and household wealth often determined what local knowledge and experiences they drew on to make water resource management decisions. For example, a child who

observed the quality of water collected from the river by sight or smell may or may not be competent to judge the quality of water fetched from an alternative water collection site such as a water tank or stand pipe. As an example, a coloured child living in Tamboekiesvlei was able to use a stand tap, unlike a Xhosa child. As with the adults, my research found that children did not have local knowledge to deal with environmental issues. In addition, I found that their capacity to manage environmental issues differed and so I learned that solutions needed to be linked to more than one method to account for the variable capacity amongst participants.

10.3.6 To Encourage and Facilitate Problem-Solving Processes and Catalyse Development through Community-Sensitive Approaches

To establish which aspects of river management the community want to solve and how

In Phase Two and Phase Three I found that identifying and setting priorities for riverine and water resource management issues requires dialogue and negotiation with all stakeholders to learn about what they consider to be the water resource management priority at the community, catchment and national scales. Once a group of stakeholders have identified their needs, they are empowered to work towards a common goal. For example, in the environmental awareness workshop held in 1997 with the Fairbairn and Hertzog participants, the need to upgrade the low level bridge in Fairbairn was identified.

My research found that the most critical features needed to prevent distrust and suspicion amongst stakeholders were transparency and collaborative processes where the researcher is a facilitator. For example with the building of the bridge at Fairbairn, community participants were involved in each step from identifying, mobilising and implementing the project.

In Chapter Nine I demonstrated that prioritising needs can be achieved by holding structured meetings that allow all stakeholders to have a voice, rather than just community leaders or a confident minority. My research used focus group discussions based on small-group dynamic methods with the diverse local and DWAF stakeholders at a workshop held in October 1999. This workshop enabled participants to identify what they saw as the main issues facing their catchment. They then reached consensus on the priority problems and identified potential ways of resolving them. Engaging in a dialogue with stakeholders to identify overlapping needs ensures that the planning corresponds to the stakeholders' interests, and therefore assures that they will have greater ownership of the activities from planning to implementation. The identification of needs does not mean that the journey will be an easy one, but rather that the participants are committed to walking the road towards mutual benefits that address priority needs. The identification and evaluation of needs are ongoing processes and form a platform upon which diverse stakeholder groups can build long-term relationships. I also learnt that within the dialogue or negotiation, care must be taken not to create unrealistic expectations.

Stakeholders become a part of the process when they direct the aims and objectives through a process of reflection, group negotiation and co-learning. An inclusive sharing of the project's vision can markedly assist in developing a good working relationships and lead all those involved in the work to feel ownership of it and be enthusiastic about it. In this respect, stakeholders need to articulate and clarify a future goal that, firstly, inspires all those involved to achieve it and, secondly, that can be clearly recognised when it has been attained. The articulated vision needs to be able to be translated into clear strategic goals and effective action. Innovation and creative thinking are an integral part of participatory projects. IWRM practitioners are constantly challenged to have the courage to experiment and to be able to adapt creatively to a changing environment.

To provide the necessary structures and information to enable the community to achieve development

During the implementation of Phase Three, I facilitated a participatory process through which the community established two statutory structures for water resource management --a CF and a WUA. In addition, informal structures and information-sharing networks were established through the team of grassroots facilitators and members of the elected steering committees working towards the establishment of the CF and WUA.

Formerly marginalised communities are not used to dealing with government structures and other economic institutions that influence their capacity to develop and change the way they manage riparian resources. Participants can actively engage with national, provincial, catchment-scale and local institutions, however, if they were provided with the skills, information and other resources to do so. The activities of the KRVP provided me with a platform to further research the role of structures and information in community development. I found that community participants willingly engaged in the formation of formal institutions such as a CF and a WUA if they are informed, treated as respected participants and provided with resources for action for development.

Effective relationships are built on mutual trust and respect. The researcher can build trust with participating stakeholders by respecting confidential information, keeping negotiated agreements, providing a solid platform for negotiation, demonstrating a belief that goals will be achieved, and affirming that participants are capable. The more participants and researchers respect one another, the more participants will seek to change and work together. My research found that this is a foundation of IWRM and it is neither a quick nor an easy process. It is one that takes time, patience and continuous effort.

The method for disseminating information on the NWA needed to take into account differences in language, culture, age and needs, while the underlying message would remain the same. Thus, those

black, white and coloured stakeholders who were literate were sent written information and further questions were answered during visits or by fax, email or telephone. The illiterate stakeholders need for information was addressed by translating the issues into Xhosa and then presenting the information to them through the text of dramas. This was then discussed in groups or individually. The goal of this awareness campaign that seeks to build capacity is that stakeholders will meet and take joint responsibility for their catchment issues, as opposed to trying to do so in isolation.

Whilst implementing the research, I disseminated information through a suite of methods including newspaper articles, a brochure, a newsletter, reports, street dramas, and telephone conversations. Printed information was presented in the local languages. In addition, the team of grassroots facilitators were especially effective communicators of information because they spoke the local language and had a cultural background that facilitated interaction with the marginalised communities in the catchment.

10.3.7 To Make a Theoretical Contribution to Broader Development Principles

One objective of the research was to make a theoretical contribution to broader development principles and practices that take cognisance of local knowledge, perceptions, community socio-economic and cultural structures and the physical environment. As a result of my research, I am able to make defined theoretical and methodological contributions. These are presented in more detail in Sections 10.7 and 10.8 respectively. The contribution of my research comes from lessons learned through implementation of research activities with community participants and the research process. The contributions include:

- **A theoretical contribution** - identifying the influences of the orientation and ecological paradigm on the application of participatory methods with communities for IWRM. It also draws attention to the need for the researchers and practitioners involved in IWRM to ensure that their orientation and ecological paradigm match the vision, goal and output of IWRM investments or activities. Key to this contribution is that participatory tools in themselves do not guarantee a participatory outcome.
- **A methodological contribution** - illustrating the importance of using a suite of participatory approaches to enable stakeholders participation in IWRM. It also identifies the influence of the orientation on participatory approaches.

10.4 Key Findings Derived from the Participatory Research

My research, conducted from 1996 to 2001, provides an insight into issues that are fundamental to effective community participation in IWRM and riverine management in the Kat River Valley specifically and more generally at the national and international levels. Key findings relevant to IWRM include:

- The importance of understanding the socio-economic, historical, political and environmental context of local communities to ensure that the institutional arrangements envisaged under the NWA are the most appropriate means to enable stakeholder participation in water resource management.
- The participatory policy of IWRM and the legal framework of the NWA provided local stakeholders with rights, benefits, duties and responsibilities from the outset. However, the framework for institutional arrangements needs to be sufficiently flexible to enable diverse stakeholders to influence and negotiate their own organisational arrangements and take responsibility. These rights and responsibilities need to include formerly marginalised and traditionally empowered stakeholders.
- For IWRM to be successful, grassroots and DWAF stakeholders need to interact constructively in a framework of respect and negotiation. Government agencies have no particularly special rights in participatory IWRM other than those specifically given to them by law.
- Because participatory policy can be implemented in a dominant orientation, practitioners need to be conscious of, and take responsibility for, how they use these methods.
- It is necessary to build the capacity of participants in conceptual understanding, as well as in practical matters such as how to hold meetings, how to deal with outside agents, and how to use computer applications.
- Developing WUA and CF requires time for the local stakeholders to explore and agree on workable structures. It was important for the local stakeholders to understand and commit to adjusting the institutional arrangements to fit their local context so that they feel comfortable with the outcome. The process needs to be reflective to ensure that diverse stakeholders and DWAF can propose changes to the WUAs' and CFs' management structures, roles and responsibilities, and functions during its' creation.
- My research activities implemented in the Kat River Valley demonstrated the potential for a suite of participatory methods to be sensitively used to enable change in water user communities and facilitate implementation of the NWA.
- Institutional arrangements need to be set up in a flexible, participatory and transparent manner to respond to IWRM local stakeholders and DWAFs' needs. This requires an enabling environment to be set up in which participation becomes possible. This environment is one where capacity is built, where methods evolve as participants needs and capacity evolves and one where all stakeholders have a voice and a choice.

10.5 General Findings

At a more generic level, participatory IWRM needs to address fundamental issues influencing human relations. These include:

- **Conflict resolution** - conflict resolution and negotiation are important elements for effective participation. An environment that enables the management of threats, opportunities and grievances needs to be enabled with proficient facilitators.
- **Recognising participant capacity** - in oppressed communities, capacity is weak. Listening and bringing stakeholders together does not of itself lead to increased capacity or participation in decision making and action. Capacity building processes need to ensure that people are treated as humans, provide a support process for continual learning, discussions and debate along-side decision making processes to ensure that all stakeholders at catchment workshops have the confidence and skills to participate. Researchers need to let stakeholders, who have become skilled in carrying out tasks, undertake related tasks on their own – recognising that people only take responsibility when it is offered to them.
- **Participatory orientation and methods** – participatory IWRM is based on a social process in which a diverse group of stakeholders come together, reflect and change their behaviours and attitudes. This is a collaborative process that requires the work to be participatory in order to ensure ownership and sustainability. Therefore, sustainable IWRM falls into the participatory orientation not the dominant orientation. Participatory approaches enable groups of people previously excluded to understand policy and develop appropriate water structures with formally dominant groups. Through the participatory approach stakeholders learn the skills of listening, dialoguing, negotiating to achieve sustainable IWRM. Participatory approaches that encourage accountability and transparency enable stakeholders to review and analysis local and external information, collaboratively make decisions and implement them. Participatory approaches stimulate partnership building and breaking down barriers previously existing between diverse groups of stakeholders. Participatory methods that are both visual and interactive enable diverse groups to participate regardless of literacy and language. It also enables complex water resource policies and research to be demystified, thus enabling stakeholders to engage confidently and knowledgeably. Workshop-based methods bring stakeholders together, to plan, prioritise, explore and implement. It is important to engage stakeholders openly in a discussion about the expectations of themselves and the research team at the start and during the research. Adverse political and institutional conditions may make it difficult to establish participatory processes. Such situations require experienced facilitators to mediate. Institutional arrangements such as WUA and CF are useful in building partnerships between local stakeholder groups and government. My research highlights that there is still much to be learnt and understood in ensuring and optimising participation in large catchment scale projects.

- **Logistics** - careful consideration of time, mobility and resources available to a diverse range of stakeholders is required. Planning workshops in rural communities requires for the following to be taken into consideration: harvesting, planting, household responsibilities and pension pay days. Transport often needs to be provided as well as note book for stakeholders to record their findings.
- **Building alliances and working relationships with government institutions** - it is essential to obtain support by and active participation of government institutions such as DWAF to sustain IWRM projects. Institutional support can be encouraged through developing contacts, sustaining dialogues, inviting institutional staff to catchment workshops where they can participate as stakeholders, and for them to share information and develop an understanding of local stakeholders through interactive planning workshops designed to build cooperation and respect and defined roles and responsibilities. Through interactive discussions, DWAF and local stakeholders came to recognise that their needs were not far apart and that they identify overlapping needs to forum a common vision. Government institution staff and other outside agents often do not have the practical skills to carry out participatory activities of IWRM projects. Active participation in research can enable them to form relationships, become involved and interact with local stakeholders and gain a practical understanding of participatory water resource management - although this in itself is not a remedy. By participating in the research DWAF stakeholders learnt more, much faster and were enabled to apply their new knowledge in a range of pertinent situations and use their learning to guide future decisions.

10.6 Key Policy Findings and Suggestions

As detailed in Chapter Three there are few policy documents dealing with IWRM and community participation in South Africa. The current policy papers include DWAF and WRC (1996) and DWAF (1997). These documents have several shortcomings with respect to effective engagement and active participation of community stakeholders in IWRM. It is not the intention of this section to detail an alternative policy for IWRM and community participation for South Africa. Instead, the goal is to raise key policy issues that could be used to strengthen the existing policy framework. Specific suggestions for strengthening the policy frameworks and participatory tools include:

- **Explaining the NWA** – the NWA is a complex document that is not easily accessible to most water users. A user-friendly guide to the NWA should be developed for use by community participants. This would complement the guide prepared for practitioners. In addition, DWAF should specify roles and responsibilities for CF and their relationship with WUA and CMA, to help participants in catchment fora to understand what they can do.
- **Work towards integrated catchment management** – the aim of this research and the focus of the NWA is riverine and water resource management. However, the biophysical causes of much water

resource degradation are located in the upper catchment, where agriculture and point source pollution from settlements and industry impact on water quality and riparian ecosystems. As their awareness of catchment-scale processes was raised, participants identified discrepancies between the NWA and role of DWAF, and their ability to manage water resources as a catchment scale. For example, the need for collaboration between the Provincial Department of Agriculture and DWAF was raised at the 1999 priority setting workshop. There is a need to shift the focus from solely integrated water resource management to integrated natural resource management and to provide institutional structures to facilitate practical working relationships to enable a whole-of-government approach to managing water resources at catchment, regional, provincial and national scales as well as at a basin-wide scale across southern Africa.

- **DWAF** - IWRM should be based on a holistic approach that enables a shift from dependence on government agencies to being driven by CMA and WUA. It is important for DWAF to understand the difference between participation (that draws on participatory approaches) and consultation (that commonly draws on dominant approaches). The policy focus should shift to include resources and practical processes for the implementation of IWRM activities, planned by local communities, on the ground. Local action planning should focus on good science to support implementation of actions on the ground. Promoting the participation of local stakeholders in IWRM is not always appropriate and feasible in all aspects of IWRM. South African communities generally have limited experience and capacity to support processes that enable institutional and community partnership for implementing water resource management activities in South Africa. There is a need to balance the rapidly rising demand for socio-economic tools that support water resource management with the limited supply of South African practitioners with relevant experience. In this respect my research complements the focus on technical research outputs for water resource management in the country.
- **Research** – there is a need to investigate how participants can plan and implement investments for on-ground IWRM works. In addition, there is an opportunity to investigate the role local communities can play in evaluation and monitoring of IWRM performance. Unless these two areas are better understood, the NWA will not deliver measurable change to water resources in South Africa. Researchers in IWRM often work in isolation from other projects. There is a need to encourage researchers in South Africa to collaborate and share their experiences in order to provide a coherent, less *ad hoc* body of knowledge. Each project will have varying experiences to offer, but the global picture created by sharing all the knowledge could assist DWAF and governmental bodies to assess the efficacy of their policies at the grassroots level.

10.7 Participatory IWRM in the Kat River Valley: Theoretical Conclusions

The theoretical contribution of my research outlined in this section calls for researchers and practitioners in the field of environmental management to be conscious of and understand the assumptions of the dominant and participatory orientations as well as those of the ecological paradigm. The orientation and ecological paradigm adopted have significant implications for development and outputs. In this section, I briefly review the influence of the orientation and ecological paradigm on the research and outline key theoretical findings.

The findings from my research demonstrate that to effectively enable participants to engage in IWRM, researchers and practitioners need to be aware and conscious of the likely outcomes of their orientation - dominant or participatory; and their ecological paradigm - anthropocentric or eco-centric. These theoretical differences are very evident when comparing the approach of different government agencies representing different portfolios and constituencies. A comparison of the National Department of Agriculture (NDA) and DWAF is one example. NDA is focussed on using natural resources for agricultural production within a sustainable development framework. The foundation of their activities is that resources are to be used to meet human needs – an approach rooted in the anthropocentric ecological paradigm. Under the framework outlined in the National Water Act (No 36 of 1998), DWAF aims to balance the needs of the environment and humans, with a reserve determined to achieve environmental outcomes established before allocating water to irrigation and other consumptive uses – an approach rooted in the eco-centric ecological paradigm which integrates human needs in a sustainable way.

Effective IWRM requires researchers to know when it is appropriate to use one or the other orientation and to know how they are approaching their work and the participating communities at anyone time. This requires researchers to reflect and to be continually aware of their choices and their likely consequences. A central finding of my research is for researchers to interrogate their own situations and ensure that their choice of orientation matches the aims and objectives of the research as well as the ultimate goal of the planned activities and the outcomes of the overlapping community framework of interest. There are no blanket formulae or prescriptions for IWRM research – it requires sound judgement and a clear understanding of the planned outcomes in order to select the most appropriate theoretical framework within which to design and implement the research.

It is the relationship between the orientation and ecological paradigm that have a direct impact on the inputs (i.e. the financial, human, equipment and consumable resources used), process (i.e. the methods used), outputs (short term changes) and outcomes (long term changes) of IWRM. This tradeoff between

short term needs and long term aspirations is at the heart of ecologically sustainable development, of which IWRM forms one part. The theoretical contribution of this research is equally valid in other countries, where the tradeoffs are essentially the same, but the framework for making the choices is different because of varying socio-economic, legal and biophysical circumstances.

Communities have many IWRM choices available to them. The choice they make will depend on the underlying ecological paradigm influencing the community. The methods they use to make these choices and implement them will be influenced by the orientation of those facilitating the process, including the government and technical elites.

A comparison of South Africa and the EU (World Bank, 1992) illustrates the different IWRM choices available to communities. With past resource allocation inequalities to correct and community development priorities such as access to potable water and local economic development as priorities, many communities in South Africa approach IWRM with an anthropocentric ecological paradigm. Conversely, in the EU, higher levels of development and sophisticated urban elites with concerns about biodiversity conservation and aquatic ecosystems suggest that many communities there approach IWRM with an ecocentric ecological paradigm.

A comparison of South Africa and China (WRI, 1998) illustrates the different methods used to make IWRM choices and implement them. The South African NWA is framed within the participatory orientation and requires active participation of key stakeholders and water user communities in most processes. As my research shows, this is not an easy aim but the policies and legislation of the country are evolving towards this participatory end point. In China, central planning dictates the fundamental water resource management choices available to communities – establishing a relatively rigid framework of possibilities within which they can make choices (Calder, 1999). Local communities and provincial governments have water allocation policies imposed upon them irrespective of the ecological paradigm or economic interests of local water users (Bruns and Meinzen-Dick, 2000).

Researchers have the choice of conducting their research in either an anthropocentric or eco-centric ecological paradigm. Whatever paradigm choice is made the researcher must make a decision whether they will approach the work in the dominant or participatory orientation. Figure 10-2 demonstrates the impact of choices made that relate to theoretical assumptions regarding ecological paradigm and development orientation. For example, IWRM that seeks to build partnership relationships between diverse stakeholders to achieve sustainable water resource management outcomes is located within the participatory orientation and eco-centric ecological paradigm. This requires researchers to: be ‘co-learners’ with the participants; to grow both intellectually and personally through a process of continual

self-reflection and to be concerned with enabling participants to examine, question and understand their own information. My research findings support the theoretical descriptions of participatory research outlined by Lincoln and Guba (1985); Carr and Kemmis (1986) and Chambers (1992a). More importantly, it is proposed that these theoretical frameworks, if applied consciously and adapted to local cultural and socio-economic circumstances, are applicable to IWRM in South Africa.

Awareness of the chosen orientation and ecological paradigm needs to occur within each phase of the research - not just at the start of the research. This was found to be especially integral to IWRM where persons from different disciplines must work together to achieve well managed water resources. This evolving process also reflects the learning and evolution of participants in the research or IWRM activities on the ground.

The influence of the researcher is affected by his/her choice and understanding of their orientation. In choosing the participatory orientation the researcher must adhere to the ethics, self-awareness and honesty of the participatory principles. However, if they adopt the dominant orientation there is no requirement for the researcher to reflect on their behaviour. It is the choice of the researcher and/or the funder, which orientation and ecological paradigm they adopt. No doubt the community has the power to choose whether or not to participate. The community can influence the researcher's choice of the orientation and ecological paradigm. For example, communities may be happy to allow scientific research to be conducted without choosing to actively participate in its implementation. However, in such circumstances the researcher will have to consider the sustainability of the research if the community chooses not to participate.

IWRM is based on the use of multi-disciplinary research teams. At the onset of an IWRM project these multi-disciplinary teams need to agree on and adopt the same orientation and ecological paradigm and ensure that it is used consistently throughout the research study otherwise they run the risk of working towards conflicting outputs (as shown schematically in Figure 10-2). The understanding of the orientation and ecological paradigm assumption will ensure that the team works with confidence and knowledge as they will make research decisions on the same assumptions and strive towards the agreed upon output. It will also prevent misunderstanding between the different disciplines on the research team, which is between the environmental scientists and social scientists.

ORIENTATION Participatory

Principles: Researcher is a ‘co-learner’ with the participants; researcher grows both intellectually and as a person through self-reflection and engagement with the work; concerned with enabling participants to examine, question & understand their own information; participants actively influence both the research process & choices affecting their lives; research evolves as it responds to the participants; research is negotiated with the participants; researcher recognises their own subjectivity & influence on the research.

Output:
Development driven by stakeholders needs and participants’ capacity for change
Example:
Rural water supply projects combining active community participation and good engineering

Output: Ecologically sustainable development
Example:
IWRM projects combining active community participation and good science

ECOLOGICAL PARADIGM

Anthropocentric

Assumptions: People are distinct from environment & have jurisdiction over natural resources; people have control over their lives; nature provides unlimited resources to satisfy community needs & wants; belief in economic & technological progress; current forms of politics & environmental decision making are satisfactory.

Output: Scientific improvement, new knowledge for human development, centrally planned development
Example:
Green Revolution

Output:
Environment policies & strategies driven by scientists
Example:
UN Convention on Biodiversity Conservation

Eco-centric

Assumptions: Other species are as valuable as humans; ecosystem integrity is highly valued, careful planning to avoid environmental impacts; environmental protection over economic growth; generalised compassion toward other species, other peoples & other generations; limits to growth; new forms of politics needed.

Dominant

Principles: No personal growth required by the researcher; the research is data focussed & is analysed & presented by the researcher & excludes stakeholders; research problems are conceptualised narrowly; seeks objectivity, goals are determined by the researcher’s needs

Figure 10-2: Assumptions & Likely Outputs of Orientation and Ecological Paradigm

The key lessons that this thesis has demonstrated surrounding the orientation and ecological paradigm and its relationship in IWRM include:

- Theoretical frameworks that describe the orientation and ecological paradigm impact on the way IWRM is planned and implemented as well as the likely outcomes of the activities.
- Sustainable IWRM relies on a participatory orientation that works with people to cultivate ecological consciousness. It also acknowledges the importance of science, social, economics and technical expertise to implement on ground works.
- The anthropocentric or eco-centric ecological paradigms can be used either in a dominant or participatory orientation. For example, the Reserve Determination Process can be applied using methods in a dominant orientation such as rules and regulations or a participatory orientation where the various stakeholders are involved and are part of negotiated consensus building and decision making.
- Implementation of participatory methods does not guarantee a participatory outcome as the research can be framed within a dominant orientation. Therefore, the best intentions are no protection against producing work with a dominant orientation.
- If research is implemented within a dominant orientation the potential for local empowerment and sustainable change is very low. In a participatory orientation, the research process is focussed on the local people and their needs, and intends to elicit knowledge, which can inspire change. Within this process, there is a conscious decision to ensure that local people are not disempowered by being deprived of the information they need to make considered decisions and to participate in decision-making processes.

10.8 Participatory IWRM in the Kat River Valley: Methodological Conclusions

The principles and assumptions of PRA heavily influenced my research. I found that its empowering belief in participants' ability to understand, negotiate and change their own lives was applicable to IWRM in South Africa. However, the research did not restrict itself only to 'pure' PRA. I found many useful insights in other participatory philosophies such as Action Research and Theatre for Development. I found that such a combination of methods was suited to addressing and healing many of the underlying causes of IWRM problems – including depression and dysfunctional communities resulting from former marginalisation.

The methodological contribution from the research is that no one approach will result in participation in IWRM. Rather it is a suite of methods, as presented in Figure 10-3 that forms a "tool kit" for participatory IWRM in South Africa. I recognise in this research that I only used a few of the participatory methods and so it is likely that other participatory approaches could also contribute to

IWRM in South Africa as they have done in other countries. The reason for this finding is that my research identified that the two dimensions that had to be managed for participatory IWRM were: 1) diverse stakeholder groups; and 2) the evolving needs through the journey from awareness raising, through capacity building to behavioural change. Therefore, one method does not fit all. This emphasises the point that IWRM requires creativity, flexibility and passion as well as sound science and professional commitment. I found that orientation influences the choice of guiding philosophy and that narrowly focussed methods did not provide the flexibility to meet the needs of a broad range of stakeholders.

The key methodological lesson from this thesis is that the methods of Lincoln and Guba (1985); Carr and Kemmis (1986); Fargher (1991); Chambers (1992a), Boal (1992; 1995); and O'Donoghue (2001) are relevant to, and practically useful for, IWRM in South Africa.

However, my research emphasises that like IWRM stakeholders in other countries, South African stakeholders in riverine and water resource management are highly diverse – having different capacity, culture, awareness and resources available to contribute to IWRM. One method or a recipe book approach to participation is therefore inappropriate. Rather a suite of methods must be used to meet the changing needs of participants as they evolve as individuals, as their groups and institutions mature, and to account for the natural diversity that is such an integral part of the new South Africa. In Figure 10-3 I schematically summarise the suite of methods that I found useful for participatory riverine and water resource management, and where each method is suited to meeting the needs of participant groups as they evolve. From this it is clear that I found that researchers should not rely one methodological approach because IWRM needs to integrate concepts from a suite of participatory methods. In this way it is possible to meet the needs of diverse groups of stakeholders as well as adapt to their evolution from awareness raising, through group growth to group maturity. This evolutionary path will result in changed water resource management behaviour – which is the ultimate requirement for achieving IWRM outcomes.

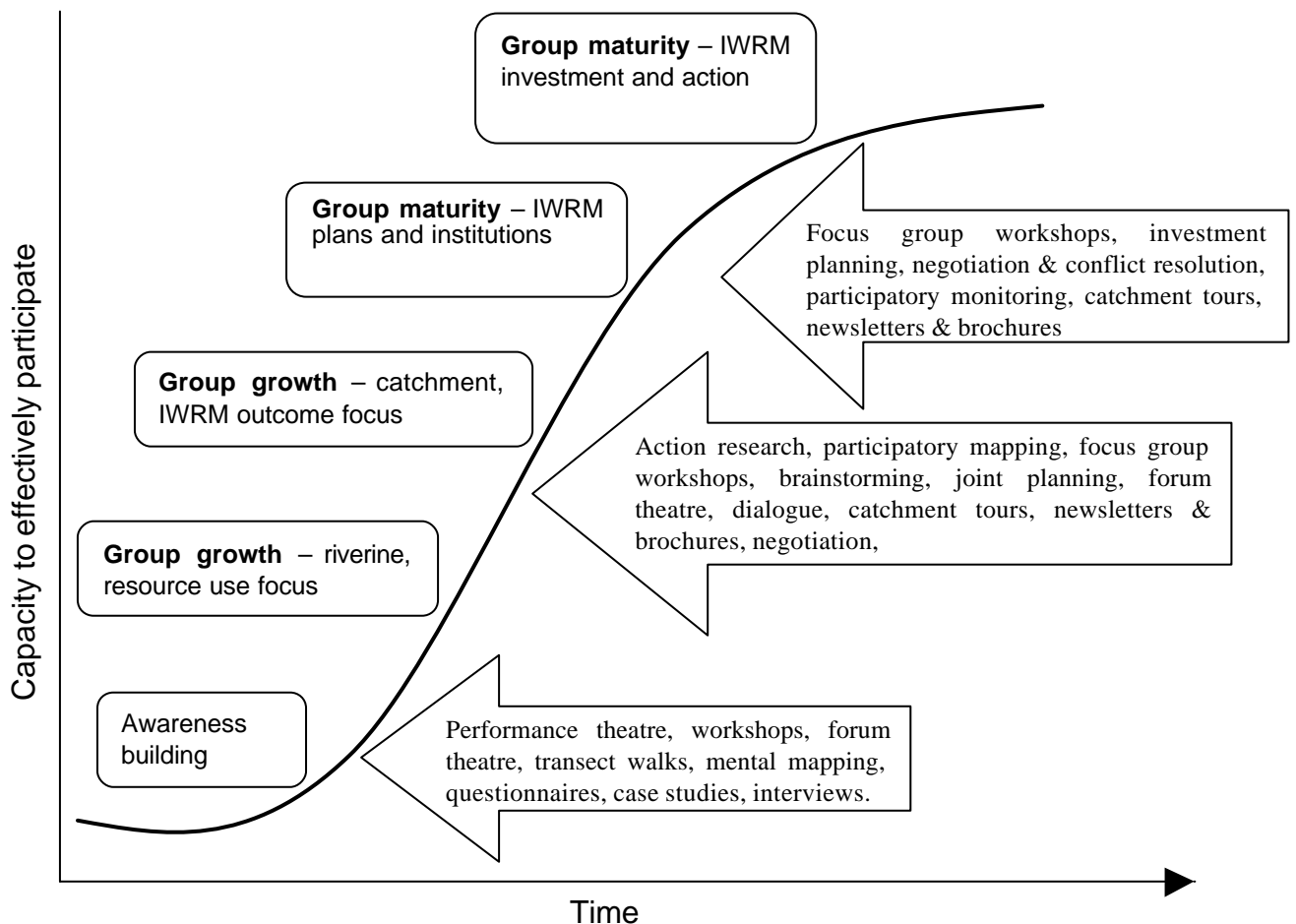


Figure 10-3 : Suite of Methods Suited to Key Stages of Group Evolution for IWRM

10.9 Summary

In terms of the original aims and objectives of the thesis several definite statements can be made, and these are presented below.

International participatory principles, concepts and methods relating to participatory approaches are clearly appropriate in the South African context, subject to contextual and other adaptations identified in Chapter Nine. This is particularly true of the methods included within PRA and Theatre for Development. I found that these methods are suited not only to formerly marginalised communities, but also to institutional and commercial stakeholders who are not marginalised and have the capacity to participate in IWRM without new or additional resources.

This thesis has demonstrated that effective water resource management requires appropriate legislation, processes that enable institutional and community partnership, and clear goals for water resource management. In South Africa, the NWA provides a legislative framework that is consistent with international best practice (Calder, 1999). Institutional and community partnerships are being built through statutory processes supported by DWAF and innovation and research supported by WRC – both of which are working towards clear goals for IWRM.

Consistent with experience in other countries, my research shows that marginalised communities respond to, and grow as a result of, participatory processes. However, my theoretical and methodological contributions emphasise that researchers and other practitioners need a practical and intellectual understanding of participatory approaches. An effective method of achieving this is by on-the-job training; that is the trainee practitioner and experienced practitioner work together in the field. The experience with Jerry Ntsebeza also demonstrates the effectiveness of train-the-trainer approaches to capacity building in local communities.

The participatory IWRM policy guidelines have been drawn up from this thesis with a view to contributing to the general debate regarding community participation in IWRM.

My research found that practitioners need to identify the influences of the orientation and ecological paradigm on the application of participatory methods with communities for IWRM. The orientation and ecological paradigm need to be selected to match the vision, goal and output of IWRM activities. Key to my research finding was the influence of the orientation on methods, as participatory methods in themselves do not guarantee a participatory outcome.

PRA, Theatre for Development, over-lapping needs, and negotiation methods are appropriate for IWRM in South Africa to enable marginalised groups, commercial farmers and government agencies to build a partnership and work towards a common vision of water resource management. I identified the importance of using a suite of participatory approaches that enable stakeholder participation to become active partners in resource management. Thus, no one guiding philosophy (for example Theatre for Development or PRA) is adequate to cope with the multiplicity of contexts that needs to be understood and engaged within IWRM. These contextual differences include implementation of improved water resource management practices; development and functioning of WUA and CF; negotiation; conflict resolution; capacity building and environmental education activities. In each case, the process depends heavily on the area's history, the stakeholders, timing, the environment and the practitioner, all of which are factors that are highly mutable. Therefore, researchers need to interrogate their own situations and make their own decisions as to which suite of methods will work best for them.

Ultimately, I learnt that the integrity and effectiveness of IWRM depends on researchers and participants adhering to professional ethics, participatory principles, self-awareness and honesty. However, without appropriate methods, understanding of process-orientated research, focus on capacity building, attention to researchers behaviour and work as well as a focus on outcomes, IWRM cannot be built sustainably within the communities, with the participants. Therefore, each facet needs to be accounted for. Failure in one aspect will frustrate marginalised groups seeking an active role in IWRM. My research suggests that

there are no universal truths that can be applied to involving rural people in IWRM. What the research does highlight is that the following elements are essential for participatory IWRM:

- clear research or project aims;
- selection of appropriate guiding philosophy, methods, and processes to meet overlapping needs;
- a focus on capacity building to enable active participation during planning and implementation of IWRM activities;
- clearly understood researcher and practitioner responsibilities; and
- a focus on outputs and outcomes to guide the planning, facilitation and implementation of IWRM research.

Participatory IWRM involves a theoretical, methodological and a practical application of participatory methods with community people. The IWRM process is an evolution, not a revolution. Sustainable IWRM is not manufactured, it is nurtured in the hearts and souls and minds of all participants.

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