

**AN INVESTIGATION OF COMMUNITY LEARNING THROUGH  
PARTICIPATION IN INTEGRATED WATER RESOURCE MANAGEMENT  
PRACTICES**

A half-thesis submitted in partial fulfilment of the requirements for  
the Degree of

**Master of Education (Environmental Education)**

At Rhodes University

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December 2011

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## ABSTRACT

South Africa is a semi arid country in which the average rainfall of 450mm/year is well below the world average of about 860mm/year. As a result, South Africa's water resources are scarce in global terms and limited in extent. Current predictions are that demand will outstrip water availability in the next 15 years. A coordinated approach to improve both water quality and quantity is needed and in order to achieve that, it is crucial to strengthen capacities of local community involvement in identifying the problems that affect them and strategies to solve them.

This research was undertaken to develop a deeper understanding of community learning processes in integrated water resources management (IWRM) practices. The study drew on situated and social learning theory which explains that knowledge and skills are learned and embedded in the contexts in which knowledge is obtained and applied in everyday situations.

Multiple data collection techniques were used within a case study design and included document analysis, interviews, focus group discussions and field observations. Data analysis was done in three phases and involved uncovering patterns and trends in the data sets. In this context I discovered, through careful observation and interviews with members of the different communities of practice, that people are learning through social learning interactions with other community members as they engage in their daily water management and food production practices. Learning interactions take place through both informal and formal processes such as meetings, training workshops, conversations and interactions with outsiders. I also discovered that people learn from 'external groups' or training programmes which bring new knowledge and expertise, but this needs to be contextualised in the local communities of practice.

The research has also shown that there are a number of challenges that appear to exist in these learning contexts. For instance it was found that participation and social learning processes and interactions are influenced by a range of causal mechanisms that are contextual. These insights into how communities learn, as well as the tensions and difficulties that are experienced in the learning processes are important for furthering learning and participation in community-based IWRM practices, projects and programmes.

## ACKNOWLEDGEMENTS

I would like to extend my thanks to everyone who assisted me, for without you this research would not have been possible.

To my Lord and Saviour, Jesus Christ for his divine grace, favour, guidance, strength and blessings.

To my supervisors, Professor Heila Lotz-Sisitka and Professor Rob O'Donoghue, I am grateful for your professionalism, encouragement and supervision. To Professor Heila Lotz-Sisitka and Lawrence Sisitka, my special thanks to you for the trust that you bestowed on me and the care you accorded me when I just arrived from Zambia and throughout the research period. Special thanks to Ashley Westaway for the moral support and for introducing me to Cata and its wonderful people. Many thanks to all my masters and PhD colleagues and not forgetting all the other staff at the Environmental Learning Research Centre. To Sirkka and Nthabiseng, many thanks to you guys for the company, support and encouragement throughout the study period. To all you guys, you made this whole process a success and enjoyable.

I would also like to thank the Water Research Commission who provided me with the funding to undertake this research project.

This study is dedicated to my late mother, Ms Belita Tembo. I am what I am because of you and I will still continue with what you wished me to do. My wife, children and family, your support, endurance and missed love during my absence from home, you have contributed a lot towards my self development. To all of you my achievements are through your love, inspirations and support. I am indebted to you all.

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## LIST OF ACRONYMS

<b>CBNRM</b>	Community-Based Natural Resources Management
<b>CBO</b>	Community-Based Organisation
<b>CMF</b>	Catchment Management Forum
<b>DWA</b>	Department of Water Affairs
<b>IAP</b>	Invasive Alien Plant
<b>ICM</b>	Integrated Catchment Management
<b>IWRM</b>	Integrated Water Resource Management
<b>NGO</b>	Non-Governmental Organisation
<b>NRM</b>	Natural Resource Management
<b>NWA</b>	National Water Act
<b>RWH</b>	Rainwater Harvesting
<b>WfF</b>	Water for Food
<b>WFW</b>	Working for Water
<b>WMA</b>	Water Management Area
<b>WSA</b>	Water Services Act
<b>WUA</b>	Water User Association

## **CHAPTER 1.0**

### **INTRODUCTION AND RESEARCH BACKGROUND**

#### **1.1 INTRODUCTION**

Chapter 1 presents an introduction to my role in community development and capacity-building. It describes how the study arose and my interest in the research. The chapter presents the research question and goals, and also introduces the study site including its historical landscape. In conclusion, it provides an overview of the study.

#### **1.2 MY ROLE IN COMMUNITY DEVELOPMENT AND CAPACITY-BUILDING**

The Zambia Community-Based Natural Resources Management Forum (ZCBNRMF) is an umbrella organisation for all stakeholders involved and interested in Community Based Natural Resource Management (CBNRM) in the country. The overall goal of the ZCBNRMF as enshrined in its Constitution is to:

Influence coordination of CBNRM interventions, influence CBNRM related policy formulation and facilitate effective implementation of CBNRM programmes and projects that develop sustainable strategic partnerships between private and public sector through continuous consultation and networking among stakeholders (ZCBNRMF, 2009).

In order to achieve this overall goal, some of the Forum's objectives as outlined in the Constitution are:

- To promote and develop community-based approaches to the wise use and sustainable management of natural resources in order to advance rural development and livelihoods;
- To facilitate dialogue, development and adoption of best practices for sustainable utilization and management of natural resources in Zambia;
- To advocate for the formulation and implementation of appropriate legal and policy frameworks to promote community participation in natural resources management and equitable sharing of costs and benefits;
- To improve and attain rural livelihoods at the household level through sustainable management of natural resources by communities in southern Africa; and

- To promote partnerships between communities, Government, Non-Governmental Organisations, International community and the private sector on CBNRM (ZCBNRMF, 2009).

The purpose of the ZCBNRMF is to ensure that “CBNRM principles, policies and practices are adopted as a mainstream strategy in southern Africa for sustainable natural resource management in a manner that promotes equitable access to, use and management of natural resources” (ZCBNRMF, 2009).

I work as a Management Orientated Monitoring System (MOMS) National Coordinator under the ZCBNRM Forum. My role is to develop and build capacities of Community-Based Organisations (CBOs) in natural resource monitoring and management in Zambia. Capacity-building enhances problem-solving abilities; creates competence and improves managerial and technical skills of the beneficiaries. This helps in addressing the enabling conditions for reversing biodiversity loss through providing human and financial resources, institutional management capacity, and enforcement of laws, regulations and codes of conduct. This means empowering local communities with the necessary knowledge and abilities to take care of their own welfare, which implies a need to understand community learning processes.

### **1.3 RESEARCH INTEREST**

My research interest lies in trying to understand how communities learn through participation in integrated water resources management (IWRM). I first became interested in community learning in the context of a wider range of CBNRM programmes and from a need to address an issue of capacity building amongst CBOs in a CBNRM Programme in Mumbwa district of Zambia. CBNRM can be defined as an approach to conservation and development that recognises the rights of local people to manage and benefit from the management and use of natural resources. This entails transferring access and use rights to communities, empowering them with legislation and devolved management responsibility, building their capacity and creating partnerships with the public and private sector actors to develop programmes for the sustainable use of a variety of natural resources (Jones & Murphree, 2004). In this regard, community-based IWRM is one aspect of CBNRM, as communities are involved in the management and wise use of water, land and related resources for their sustenance. After almost three decades of experimenting and learning from CBNRM experiences it was clear that capacity building is a key requirement for the success of community-based institutional development structures and processes. However, in almost all CBNRM programmes, facilitation that builds real and lasting

capacity remains a challenge and this has affected the implementation and sustainability of community projects. Community learning in these contexts is poorly understood; which in turn affects the way in which training and capacity building programmes are designed and supported.

#### **1.4 RESEARCH QUESTION AND GOALS**

The aim of my research is to investigate how social learning takes place as communities participate in selected IWRM practices.

The research question is: How do communities learn through participating in IWRM practices?

And the goals of the study are:

- To understand and describe how learning takes place as communities participate in selected IWRM practices;
- To understand community questions and what knowledge resources are available to mediate these questions; and
- To understand how water management structures and underlying mechanisms influence learning processes and opportunities with specific reference to IWRM practices.

As my main focus was to develop deeper understanding of community learning processes in IWRM practices, I needed to allow the practitioners knowledge and experiences of their context and practice to be captured.

#### **1.5 THE STUDY SITE**

The case study research that I undertook focusing on community learning was done on a rural Eastern Cape community in South Africa, named Cata. It is a village of 3 settlements (Skafu, Ndela and Nyanga) and was arrived at as a study site due to the existing IWRM practices that are already in place in which community members are participating. Cata is also located in the upper catchment of the Cata River. In this upper catchment area issues of water management are different from those of the middle and lower catchment areas (Phiri, 2011a).

### **1.5.1 Biophysical, geographic and demographic characteristics**

Cata is located in the former Ciskei Bantustan of the Eastern Cape Province, in the Amathlathi Municipality of Amatole District Municipality of South Africa. The province is one of the poorest in South Africa with up to 68.4% of people living in poverty in 2002, an increase of 14% since 1996 (BRC, 2007). It is located approximately 58 kilometres north of King Williams Town (see Figure 1.1). The village is nested against the slopes of the Amatole Mountains, which forms an important catchment for the whole area. The Cata River is the main source of water for the people and livestock, and runs through the middle of the settlements through the Cata Dam to the south (BRC, 2007). The people of this village, who speak *isiXhosa*, were resettled under the practice of Betterment Planning by the old apartheid government (Phiri, 2011a), a system which has been widely critiqued (see Section 1.5.3 below).

Land use activities include commercial agriculture production, community-based or small-scale agriculture through garden plots (500m<sup>2</sup> in size) and livestock rearing, and commercial forestry in the upper catchment of the Cata River. Other land use activities include trout fishing tourism in the Cata River. The vegetation in the area consists of a mixture of highland sourveld and dome sourveld. The highland sourveld is situated on the mountain areas whereas the dome sourveld is located in the lower lying areas (Anderson & Axelsson, 2005).

Mean annual precipitation at Cata is 632 mm with 431.6 mm (68.2%) falling during the standard crop production period (October – March). Rainfall at Cata can vary between 153 mm and 710 mm during the crop production period. With this high variation, rainfall can be classified as erratic and could pose as a limitation on crop production (Anderson & Axelsson, 2005).

### **1.5.2 Socio-economic characteristics**

Through village surveys conducted in 2001, it was found that there were 422 households in Cata with an average household size of 6.7 people resulting in a population of approximately 2, 827 people (BRC, 2007). In early 2000, 36% of households were struggling, which meant that they had no dependable source of income. From 1996 to 2001 the percentage of households with no income rose from 16% to 43% (ibid.). Amongst others, the reason for the increase in poverty was that the amount of economic activity taking place in the village declined. One of the prerequisites for local economic development is adequate available local skills. Although there had been modest improvements in overall levels of

education in Cata since democracy, there were still only just over 100 people who had a matriculation certificate in 2001 (BRC, 2008).



**Figure 1.1:** Map showing location of Cata (Sourced from BRC, 2007)

### 1.5.3 Historical background

“Betterment” was a political concept used by the apartheid government to restructure the homeland’s scattered black settlements and bring them together into larger blocks. Betterment planning started in the 1930’s in South Africa. It involved the division of land into residential, arable and grazing land, the relocation of people from their scattered homesteads to new concentrated betterment villages, a reduction of the number of livestock that could be owned by families and the fencing off of residential and grazing areas (in order to introduce rotational grazing). From 1948 to 1950, the Government had a research project in Ciskei, to see if Betterment would have an impact (Anderson & Axelsson, 2005). This project was carried out in six villages in Ciskei and Cata village was one of them. But it was not until the 1960’s that the apartheid regime introduced this reform, and it forced the inhabitants of the homelands to leave their homes. The official purpose and assumption of “Betterment” was that the inhabitants would have it ‘better’ if they moved together into a village to apply peasant farming. It would also be closer for them to schools, medical services and larger roads. But these were not real problems for the inhabitants in the first place. The effects of this unpopular social engineering policy were to crush well working and strong community structures which led to the expansion of poverty and unemployment. In this way the apartheid regime could use the labour in the numerous mines, industries

and farms instead and it would be easier for the Government to regulate and control the land use in these areas (BRC, 2007).

Between 1963 and 1968 “Betterment” was enforced in Cata and after this the people’s situation got worse. Before “Betterment”, the settlement of Cata was scattered across the valley and the area was divided into eight villages; Ngxangxase, Kolofu, Nyanga, Ndela, Skafu, Nyokana, Jili and Marhawule but after Betterment these village sections were brought into the three current sections; Nyanga, Ndela and Skafu. After villagisation, the people had very small residential and arable lands. The arable parcels were allocated far away from the people’s homes, which resulted in their underutilization, making even subsistence farming untenable (Hoffman & Ashwell, 2001). Instead of developing agriculture and improving the quality of life in the rural areas, “Betterment” ensured a steady supply of migrant labour for white South African industries, mines and agriculture. The negative consequences of “Betterment” were social, political, economic and ecological (Anderson & Axelsson, 2005). Groups of close kin were broken up, destroying support networks as well as undermining economic activity that often depended on neighbourhood networks. Political organisations and economic relationships were destroyed and the effect on agriculture was extremely negative. Figures from Witsieshoek, a “Betterment” area in the former Transvaal, indicate that by 1950, of the total population of 14 000 households, about 4 000 had no land or cattle and approximately 75% had no stock (Ibid: 11).

As a result, there was intense suffering in the homelands. One old man in the village said that a family could have about 300 sheep and 100 cows before the reform, but when their land was reduced it was hard to feed that many animals. He said after three years they could only feed 20 sheep and 10 cows, others were either sold, stolen, slaughtered or they died. The suffering was huge and many people starved, died of deficiency, diseases or ran away from the misery. Socially and economically the impact of “Betterment” was devastating (Anderson & Axelsson, 2005).

As indicated above (this section) “Betterment” has had a negative effect on the lives of the people of Cata socially, politically, economically and ecologically. As a result, its consequences have influenced the outcomes and success of participatory initiatives (processes of interaction and learning) in the three IWRM practices in Cata Village and which have been discussed in Section 1.5.4 below.



#### **1.5.4 Integrated Water Resources Management Practices**

For this study, the use of social learning theories such as situated learning in communities of practice and critical realism theory (see Sections 2.6.1 & 2.6.2) were identified as useful tools for understanding learning processes that occurred through local actions, interactions and practices and the various mechanisms and events that influence participation and learning opportunities through engagement in IWRM practices. In Cata, people are engaged and participating in different practices as a source of employment, livelihood strategy, skills development and addressing socio-ecological issues affecting them amongst others using an IWRM approach.

The three IWRM practices selected for understanding the learning interactions are described as follows;

##### **1.5.4.1 Water for Food community of practice**

Water for Food community of practice was formed by people who wish to capitalize experience, share and create new knowledge and innovations through sustainable use of water resources for food production within the concept of IWRM. The Water for Food community of practice is supported by the Department of Agriculture and the Border Rural Committee (A rights-based non-governmental organisation). There are currently 21 Cata families that have established and are farming Water for Food gardens and they have developed strategies focusing on trench gardening, nutrition and home food production amongst others through rainwater harvested (Umhlaba, 2008).

##### **1.5.4.2 Cata Agricultural Project community of practice**

The Cata Irrigation Scheme is an example of a smallholder irrigation scheme where land-rights holders have recently grouped their plots together with full-time, commercial farming in mind. The case revolves around a strong informal partnership between a support Non-Governmental Organisation (Border Rural Committee) and a local cooperative in the face of ongoing skills and profitability challenges. The irrigation farming is implemented through a collaborative structure called the 'Company Committee'. This relationship is, however, structured in a typical Non-Government Organisation/community partnership manner, whereby the partnership is not defined by a paper contract, but rather by relationships, and where consultation and joint-decision making takes place on a reasonably extensive scale. In other words there is perceived mutual ownership of the outcome of the partnership work. The

agreements are largely based on long-term relationships and trust, characterised by joint decision making. The Scheme covers 22.75 hectares, made up of 20 individual plots. The plot owners are members of the scheme. Institutionally a management committee, which includes the project members, the Border Rural Committee, and the Cata Communal Property Association was set up with the intention of improving local participation in decision making and management processes (Umhlaba, 2008).

#### **1.5.4.3 Working for Water community of practice**

In Cata, Working for Water is implemented through the Community Works Programme which is part of the Expanded Public Works Programme. The Working for Water aims at improving and securing water supplies through engaging local communities in clearing of invasive alien plants which reduce the flow of water in streams and rivers. Although the main goal of the Working for Water project is to eradicate invasive alien plants in order to recover water, other objectives include the conservation of biological diversity, and empowerment of local communities through job creation. The project has so far been labour-intensive where community members of Cata are employed by working for those hired as contractors. The contractors who are drawn from local communities, direct the clearing process with their respective community members. The contractors are contracted by the Working for Water project in collaboration and support of the Cata Communal Property Association. The Cata Communal Property Association is a community-owned association which holds, manages, develops and administers land within the Cata locality on behalf of the community (Phiri, 2011a).

### **1.6 OVERVIEW OF STUDY**

*Chapter 2* describes the literature that has been used in guiding the explanations in the study. The chapter presents an overview of the water situation in South Africa and what strategies have been put in place for promoting public participation. It also provides an insight into social learning theories and more specifically situated learning in communities of practice. The chapter outlines how critical realism theory has been used to investigate the various mechanisms and events that influence participation, learning interactions and opportunities in the three selected IWRM practices. It also presents a description of research that has already been done pertaining to community participation and learning in IWRM.

*Chapter 3* presents a discussion of the research methodology and the theoretical orientation used in this study. As I needed to gain a deeper understanding of how communities learn as they participate in IWRM practices, a case study methodology approach with an interpretive perspective was used. The chapter also describes why a case study approach was used. It further describes the methods of data collection, management and analysis. It also discusses issues of validity and trustworthiness, research ethics and limitations of the study and how each of them was addressed.

*Chapter 4* outlines the findings from the case study research that I undertook focusing on community learning in a rural Eastern Cape community, Cata. I started by developing an understanding of how communities were participating and learning in IWRM practices. The chapter presents the data generated through focus group discussions, interviews, observations and documents. The organisation of Chapter 4 is guided by the analytical memos I constructed (see Table 3.3 under Section 3.5.2), based on the themes that emerged from the data, providing a thick description informed by the research question and goals (see Section 1.4.).

*Chapter 5* provides a discussion of the data based on the significant themes that emerged from the data presented in Chapter 4. In Chapter 5, analytical statements were presented as a way of communicating the main findings of the study. The study discussion draws on the theoretical and contextual perspectives presented in Chapter 2.

*Chapter 6* provides a summary of the study and key findings emerging from the research. It provides recommendations based on the analytical statements presented in Chapter 5. The chapter also presents recommendations and opportunities for further research and a conclusion of the whole study.

## **CHAPTER 2**

### **REVIEWING THE CONTEXT AND THE LITERATURE**

#### **2.1 CHAPTER OVERVIEW**

Chapter 2 provides insight into the literature that I have drawn on in this research. It presents the water situation in South Africa and what strategies have been put in place for promoting public participation and learning as well as what is learnt by the participating stakeholders. The chapter also provides an insight into social learning theories and more specifically situated learning and legitimate peripheral participation in communities of practice. The chapter further outlines how critical realism theory has been used to investigate the various mechanisms and events that influence participation, learning interactions and opportunities in the three selected IWRM practices in the Cata community. It concludes by presenting a brief description of research findings pertaining to community participation and learning in IWRM.

#### **2.2 SOUTH AFRICAN WATER SECTOR**

Water is essential for our survival and estimates indicate that over a billion people today cannot obtain enough clean water to meet their basic human needs (Pahl-Wostl, 2007). Water scarcity plagues 27 nations, and an additional 16 nations are considered water stressed (Herold, 2009). The United Nations has also identified rising demand for water as one of four major factors that will threaten human and ecological health over the next generation (Pahl-Wostl, 2007). Therefore, a secure and safe water supply and protection of essential water resources through sustainable water development and management is a critical component of development for all societies.

South Africa is a semi-arid country (65% of the country) in which the average rainfall of 450mm/year is well below the world average of about 860mm/ year. As a result, South Africa's water resources are in global terms, scarce and limited in extent (Pahl-Wostl, 2007). The country is to a large extent dependent on surface water abstraction and water resources are highly developed, leaving little scope for increasing the water supply. Current predictions are that demand will outstrip water availability in the next 15 years (Pollard & Walker, 2000). Climate change forecasts predict reduced runoff, increased rainfall variability, and more frequent flood and drought events. These predicted changes in water availability in an already water stressed country with a well-developed agricultural sector challenges

both water resource planning and mindsets about current and future land uses. Consequently, present and future availability is heavily dependent on climate, water use and management, and land use practices. The increasing frequency of extreme events such as floods and droughts entails an even more uneven distribution of water availability across time, thus making a steady supply of water for social uses and sufficient water provision for the ecological system, even more difficult. The South African Department of Water Affairs estimates that by 2025, the country will be classified as chronically water scarce (Herrfahrat-Pahle, 2010).

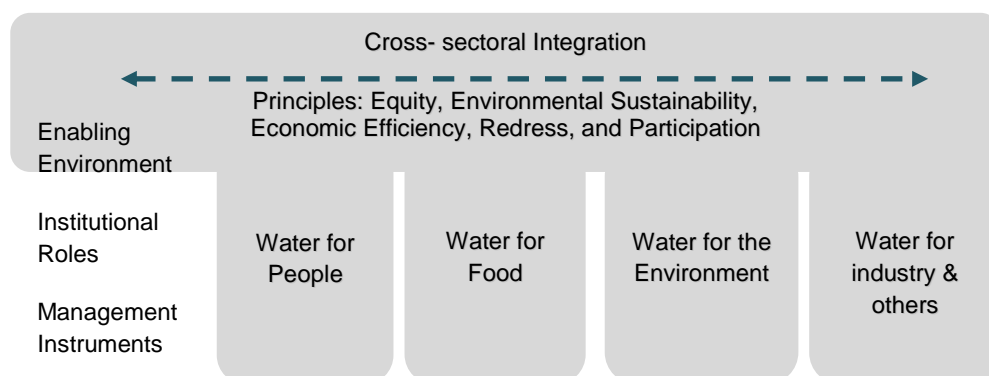
Practical examples of the problems being experienced are already evident. There are conflicts between users over water resources. For example, in dry years there is conflict in the Komati River Basin between sugar farmers and larger commercial operators, as well as with users downstream in Mozambique (Herold, 2009). The decreasing water resources not only affect ecological systems, but also social systems and the economy. South Africa shares six river basins with a number of neighbouring countries whose water demand is also increasing (Pahl-Wostl et al., 2007; Warner, 2006). Dealing with water scarcity, competition for water and pollution, and reducing impacts requires the best methods to do so. A coordinated approach to improve both water quality and quantity is therefore needed, especially with South Africa's social and economic priorities such as food security, the development of the green economy and job creation (Herrfahrat-Pahle, 2010).

## **2.3 INTEGRATED WATER RESOURCE MANAGEMENT**

It is argued that effective and sustainable management of water resources is vital for ensuring sustainable development, and an integrated approach is said to be the most remarkable of the approaches to managing this vital resource (Warner, 2006; Mirumachi & Van Wyk, 2010). The global response to challenges in water resource management has been to encourage what was, at the time of the Rio Earth Summit in 1992, a novel approach, called IWRM. IWRM is a process that aims for the sustainable use, management and development of water, land and related resources (GWP, 2009). Lotz-Sisitka and Burt (2006) also define IWRM as a management approach, which requires the active participation of multiple parties across multiple levels, in many different ways. The definition emphasises that IWRM is a process. It is a means to an end; or rather it is the process of balancing and making tradeoffs between different goals in an informed way (Sultana, 2009; Jonch-Clausen & Fugl, 2001).

Within the framework of sustainable management of water resources, IWRM is regarded as an appropriate approach to address threats posed to water resources as it takes into account a broad spectrum of social, economic, and ecological factors and their links (Warner, 2006). The IWRM process depends on collaboration and partnerships at all levels, based on a political commitment to and wider societal awareness of the need for water security and the sustainable management of water resources (Jonch-Clausen & Fugl, 2001). Implementing IWRM therefore requires a change from a single-sector, centralised delivery-oriented management, to sector-integrated, locally focussed management, which incorporates the interests of diverse stakeholders. The overall goal is to ensure sustainable water resource use through multi-disciplinary and interdisciplinary approaches.

Three fundamental elements of IWRM have been identified internationally, namely; enabling environment; institutional roles; and management instruments (see Figure 2.1), which require a participatory approach to IWRM as an alternative approach to government stewardship of water resources, and as a relevant and logical avenue to consider. IWRM stresses the “participatory approach”, where water is a subject in which everyone is a stakeholder (Pahl-Wostl, 2007).



**Figure 2.1:** IWRM requires integration of institutions & management instruments across water use sectors (Adapted from Jonch-Clausen & Fugl, 2001)

Through its national Water Policy (1997) and related legislations; Water Services Act of 1997 and National Water Act of 1998, South Africa has transformed its water sector and proposed Integrated Catchment Management as an approach to IWRM. This aims at increasing water use efficiency, promoting equitable access to water and achieving sustainable use of the resource. It also ensures taking a systematic hydrological approach and looking at the problem from the point of view of the resource. The water law is now based on the premises of equitable access to water as well as

sustainable and efficient use of water (Pollard & du Toit, 2005; Warner, 2006). Therefore, the role of public participation in Natural Resource Management development projects and processes is becoming more prominent as new policies are approved and adopted. A cornerstone of effective decentralisation is the achievement of increased participation from stakeholders at various levels and stages in the decentralisation process. To achieve this, participation has been institutionally embedded within government legislative frameworks such as the National Water Act in the South African context relating to IWRM (Lotz-Sisitka & Burt, 2006).

## **2.4 COMMUNITY PARTICIPATION AND LEARNING IN IWRM**

### **2.4.1 Community Participation**

Brown (2011) defines participation as a process through which stakeholder's influence and share control over development initiatives and the decisions and resources which affect them. However, participation means many different things to different people and different interest groups under different circumstances; as a result clarity around the concept is a critical factor in determining how it is translated into practice (Burt et al., 2006). Community participation is therefore a critical component of the IWRM process.

Since the mid 1990s, South Africa has been undertaking comprehensive water governance reforms based on the IWRM concept. The National Water Act of 1998 opens a way for ordinary people to take part in water resource management and makes provision for a number of stakeholder platforms such as the Water User Association and Catchment Management Forum where IWRM can be negotiated at the level of a Water Management Area. The use of catchment management as an approach to IWRM is not only important as a means of integrating land use and water uses, but is also critical in managing the relationships between quantity and quality, and between upstream and downstream water interests (Grimble & Wellard, 1997; Warner, 2006).

The purpose of establishing these agencies is to devolve water resource management to the regional or catchment level and to involve local communities, within the framework of the National Water Resource Strategy (RSA, 2004). These are also platforms where decisions will be taken and collaborative actions will be designed in order to strategically manage water resources for and by the inhabitants of a Water Management Area. One of the core assumptions of the National Water Resource

Strategy is that public participation, particularly at the intermediate and local levels, leads to improved use and management of water resources. Improved management implies taking better account of user's needs and engenders collective responsibility for interventions in the water sector (RSA, 2004). As Lotz-Sisitka and Burt (2006) have argued, the aim is to have sustainable, equitable and efficient water resource management through local relevance, appropriate management structures, greater opportunity for involvement and feedback by local stakeholders, and greater opportunities for integration with other local planning and development initiatives. An important issue here is the need to identify and designate water resource management functions at the lowest appropriate level of implementation. IWRM with its proposed institutional arrangements as set out in the National Water Act provides the broad context for the engagement of the general public in water resource management. Once Catchment Management Areas are established they are expected to manage water in collaboration with local stakeholders (Pollard, 2002).

The successful implementation of IWRM requires supportive policies and legislation that are creating an enabling environment for the active participation of the public (especially local communities). Apart from the water policy and its related legislative frameworks, the South African government has also adopted a Policy Framework for Public Participation (RSA, 2005). The Policy Framework for Public Participation is a government commitment for the provision of a form of participation which is genuinely empowering, and not a token consultation or manipulation. This involves a range of activities including creating democratic representative structures (ward committees), assisting those structures to plan at a local level (community-based planning), to implement and monitor those plans using a range of working groups and CBOs and to support these local structures through a cadre of community development workers (RSA, 2005). This is intended to lead to a process of ensuring public consent, acceptance and full participation by involving people and giving them a voice in local water affairs (Reed, 2008). The importance of involving local communities in conservation projects is now widely accepted within conservation circles and particularly within the growing areas of integrated rural development and natural resource management projects, including IWRM (Warner, 2006).

#### **2.4.2 Different forms of participation**

There are a number of forms of participation within the context of WRM, which are linked to different purposes for participation (Pretty, 1995). These purposes may be political or practical and the forms of participation will also vary with the stakeholders' capacity to participate and the issues that need to be



addressed by stakeholders to manage water resources successfully (Kliksberg, 2000; Lotz-Sisitka & Burt, 2006).

#### **2.4.2.1 Participation as consultation**

Participation is often times used as a process for consulting the people who are affected by a particular issue. Consultation is usually used when broad public participation is needed, as anyone can participate by commenting (Burt et al., 2006). Consultation can be used by decision makers in either government agencies to seek advice, information and opinions about strategies, policies and services. When done well, wide stakeholder consultation and participation in programme design and implementation can lead to mutually reinforcing benefits, encouraging local ownership of development resources and activities (Gebremedhin & Theron, 2007).

#### **2.4.2.2 Participation as decision-making**

Participation can also be used for decision-making processes. Decision-making enhances sustainability. By engaging people including civil society, local communities, the private sector, and academia in the decisions that affect them, each group is more likely to build a stake in the success or failure of activities. Ideas imposed from outside often fail to gain the same traction as policies that local governments and communities have been involved in devising and over which they feel a sense of ownership (Burt et al., 2006). For stakeholders, and in particular rural and marginalised groups, it is essential that appropriate methods be adopted to ensure that these groups are able to clearly understand concepts and be able to not only participate in the management of institutions but also actively contribute to decision-making processes (Burt et al., 2006).

#### **2.4.2.3 Participation as capacity-building**

Participation promotes capacity-building amongst the stakeholders and enhances meaningful participation. Lotz-Sisitka and Burt (2006) argue that people will not participate unless they have an understanding of what they are participating in and why they are doing so. Herrfahrat-Pahle (2010) supports this and argues that the key to the development of capacities of stakeholders especially that of local communities is to enable them to acquire appropriate knowledge and skills which will enable them to participate effectively in IWRM. Capacity-building in communities is an important objective, but needs

to be preceded by mobilisation of community capacity that already exists but becomes evident only when communities are empowered. It is important therefore to develop strategies for working within local cultures and existing practices which takes account of and values local knowledge (Haddad, Al Zoubi, Alaween & Shraideh, 2007). Brown supports this and argues that it would be more valuable to engage communities in participatory projects (such as Working for Food), which strengthen their abilities to maximise the benefits of existing local water management rainwater harvesting practices, instead of participating in structures that would appear to be ineffective in addressing community needs (imposed platforms on communities established without consultation) (Brown, 2011). There is evidence that many aspects of natural resource management, including water allocation and usage, are regulated by traditional institutions and structures, which have not been formally considered in the newly-proposed structures (Burt et al., 2006). Indigenous and traditional management approaches represent a considerable contribution to regulating access to water resources (ibid.). Lotz-Sisitka and Burt (2006), propose that in the South African context, it would seem important for the Department of Water Affairs to develop strategies for working within local cultures and existing practices where relevant and also include taking account of, and valuing local knowledge.

#### **2.4.2.4 Participation as expressing a need**

Sometimes people participate when they have a need or an issue that they want addressed. In such instances, the platform for participation is the issue at hand and becomes inevitable (Burt et al., 2006). This implies that when faced with challenges or uncertainty, people tend to get together so as to respond and address these situations. What drives people to get together is the issue before them. Participation sometimes stops when the need or issue has been addressed or resolved. A practical example would be the Working for Water project where community involvement in the removal of invasive alien plants would stop when the problem created by the alien plants is addressed. In this case, the platform for participation is the water scarcity caused by the invasive alien plants.

#### **2.4.2.5 Participation as partners for implementation**

Sometimes people are involved in a participation process when they are required to be partners in the implementation of water resource management activities. For example, in Cata, the community is a key partner in implementation of the invasive alien plant removal to improve and secure water supplies under the Working for Water project (Phiri, 2011a).

### **2.4.3 Factors influencing participation**

Various factors determine the outcomes and success of participatory initiatives. Participation is influenced by a number of contextual factors and the causal relationships between these factors. This entails that understanding or establishing best practice in IWRM would involve understanding of the interplay of a range of different contextual factors that influence and shape participation possibilities, the quality and opportunities for participation (Burt et al., 2006). These, among others, include factors such as history, power relations, poverty, policy, language, education level and experience, knowledge, interests, individual agency, resources and ways of doing (ibid.). These are briefly described below.

#### **2.4.3.1 Power relations and conflicts**

Lotz-Sisitka and Burt (2006), contend that while participatory practice is often established with a view to reducing power gradients and enabling more equitable forms of natural resource management, participation does not always lead to a balance of power. The authors say participation can actually entrench existing power relationships because of a lack of clarity or ambiguity as to the meaning and role of participation in WRM. Power relations, sometimes referred to as 'power gradients', often hamper equitable and fair participatory practices (Burt et al., 2006). The different meanings ascribed to participation affect the focus of participation and thus the power relations between people and organisations. Therefore, issues related to power inequalities must be taken into account, otherwise the negotiation process itself may make them worse (ibid.). Others claim that conflict may be a precondition for meaningful participation. Burt et al. (2006 citing Daniels & Walker, 2001) maintain that conflict in natural resource management is not only unavoidable but that it is desirable, because it can lead to innovative agreements among stakeholders. This notion is supported by Wals (2007: 40), who notes that:

In social learning the conflicts and their underlying sources need to be explicated rather than concealed. There is no learning without dissonance, and there is no learning with too much dissonance. ...An important role of facilitators of social learning is to create space for alternative views that lead to the various levels of dissonance needed to trigger learning both at the individual and the collective level.

Conflict can also function to highlight issues that are important to marginal groups, which might not otherwise be recognised.

### **2.4.3.2 Language**

Tusting (2005) contends that language plays a central role in everyday activities within communities of practice. Therefore, understandings of the processes by means of which community of practice are constituted and maintained require attention to the role of language in these processes. Language is one factor to look out for that mediates and influences how people learn about and perform their water practices. Lupele (2003) working on participatory materials development in rural Zambia noted that language plays an active role in knowledge construction. He stressed that community members would not have participated in the process of developing posters as well as they did if they had not used language that they were familiar with. He further suggests that in order to enable participants to generate information based on their experiences, it's important that they use the language they are comfortable with (ibid: 90). The ability to communicate effectively directly affects the way in which people are able to make decisions and act. This is demonstrated by examples of a study where certain stakeholders were excluded from the Catchment Management Area establishment process because of their inability to speak English (Lotz-Sisitka & Burt, 2006).

### **2.4.3.3 Education**

Level of education is a powerful factor influencing participation. Higher levels of education with a concomitant increase in skills can foster higher levels or different kinds of participation. People who have attained higher levels of education are more likely to participate because they are more aware of the impact of government on the individual, have more political information, and consider themselves capable of influencing government activities (Clapper, 1996). They have more opinions regarding political subjects, are liable to discuss politics more and with a wider range of people, and are more likely to be active members of a community and other organisations (ibid.). This is acknowledged by Lotz-Sisitka and Burt (2006) who argue that many South Africans have not had access to education or have had limited education. Many people do not have the skills or information needed to participate in WRM.

#### **2.4.3.4 Participation structures**

A study done by Lotz-Sisitka and Burt (2006) indicated that emerging structures for public participation have been nationally framed through policy, guidelines and the National Water Act, but are implemented at local level. These structures do not necessarily roll out in a smooth and uncomplicated manner at a local level. Each Water Management Area has specific contextual factors that need to be considered and in many cases regional officers responsible for local establishment of Catchment Management Areas are finding that in practice the institutional arrangements envisaged are not always easy to set up. It has also been found that work towards development and strengthening people's ability to work within these structures was needed if they are to be relevant to their intended objectives (ibid.).

#### **2.4.3.5 Policy framework**

The successful implementation of IWRM requires supportive policies and legislation that are harmonised in all spheres of government. This also includes accountability, good governance, committed civil society and institutions that have the capacity to implement the relevant policies (Phiri, 2011b). The National Water Act provides a framework for the participation of all stakeholders in water resource management. It recognises that without public participation, the goals of WRM cannot be achieved. In addition to the water policy, the Policy Framework for Public Participation provides a framework for public participation through the creation of democratic representative structures at local level to implement and monitor community-based initiatives (see Section 2.4 above).

For effective and meaningful participation to be achieved stakeholders, in particular local communities, must be capacitated in order to strengthen their involvement in identifying the problems that affect them and strategies to solve them (Phiri, 2011b). Gumbo, Van Der Zaag, Robinson, Jonker and Buckle (2004), also add that one of the major constraints in water resources management is the absence of well-structured education and training programmes suitably targeted for stakeholders in the water management chain. Furthermore, this training has to move beyond mere transfer of knowledge and skills to actual implementation (ibid.). This means empowering local communities with the necessary tools to take care of their own welfare through learning.

#### **2.4.4 Learning within a community**

People learn by making sense of the environment and of stimuli around them. Greater perceptual development and learning occur in environments that are rich with stimuli and provide useful feedback in response to a learner's efforts to act upon the environment (Hammond, Austin, Orcutt & Rosso, 2001). Learning is a process of drawing connections between what is already known or understood and new information. Thus, prior knowledge is important to the learning process. People make connections and draw conclusions based on a sense of what they already know and have experienced. For learning to occur, facts, concepts and ideas must also be stored, connected to other facts, concepts, and ideas, and built upon (ibid.). Billet (2004) supports this notion by expressing that engaging in familiar practices reinforces and refines procedures and what is already known.

In communities, the interactions people make and understandings they develop are often dependent upon and influenced by what is valued and what is experienced within their environment. Culture influences the knowledge and experiences people bring to the gatherings, the ways in which they communicate and interact, the expectations that they have for how learning will occur, and the ideas they have about what is worth learning (Sarason, 2004). The social context created within the social interactions, the ways in which communication, and opportunities for collaboration are structured, all influence the learner's understanding and construction of knowledge. The compatibility between cultural contexts, tasks, and modes of communication within communities of practices influence the ease with which learners learn and make connections to their experience, and hence to make sense of everyday learning experiences (Hammond et al., 2001).

More on learning within a community is covered in the upcoming Section 2.5 on theories of learning.

#### **2.4.5 Learning and IWRM in community contexts**

Through participating in water resource management structures, communities are expected to learn so as to build their capacities to engage effectively. Lotz-Sisitka and Burt (2006) argue that participation itself is a powerful form of capacity-building and that capacity-building is necessary for meaningful participation. People will not participate fully unless they have an understanding of what they are participating in and why they are doing so.

According to Sfard (1997) there are two metaphors of learning that guide our work as learners, teachers, and researchers; acquisition and participation metaphors. Acquisition metaphor involves reception, acquisition, construction, internalisation, appropriation, transmission, attainment, development and accumulation. This may be through the teacher helping the learner attain his or her goal by delivering, conveying, facilitating, mediating, and so forth. In the participation metaphor, participation is a learning experience. Learning implies participating in instructional activities or as a process of becoming a member of a particular community. This entails, above all, the ability to communicate in the language of this community and act according to its particular norms (ibid: 6).

In the study area, Cata, people are participating in local water management structures that have developed around a practice (see Chapters 1 & 4). People are acquiring both formal (expert knowledge) and informal knowledge through facilitated training interventions and social interactions. Daniels (2008: 99) citing Brown et al., (1999) argues that:

Knowing and doing are reciprocal – knowledge is situated and progressively developed through activity and that one should abandon the notion that concepts are *self-containing entities*, instead conceiving them as *tools*, which can fully be understood through use. Learning is understood as a process which is often tacit and takes place through shared or joint action and has a generative effect on the pattern of activities in which it occurs.

In contextual profiling research undertaken in preparation for this study, I noted that what is learned by the different communities of practices in the study area is acquired through the various learning interactions taking place (Phiri, 2011a). The learning being emphasised in these interactions is more focussed on the *processes* of acquiring knowledge through engagement than the *content*. Although what is learnt is equally important, what is also key is the process through which that knowledge is generated and acquired, as it determines the relevance and quality of learning (Shumba, Kasembe, Mukundu & Muzenda, 2008). This idea is supported by Wals (2007: 39) who suggests that:

Social learning is perhaps not so much what people should know, do or be able to do but rather: How do people learn? What do they want to know and learn? How will they be able to recognize, evaluate and, when needed, potentially transcend or break with existing social norms, group thinking and personal biases? What knowledge, skills and competencies are needed to cope with new neutral, social, political and economic conditions, and to give shape and meaning to their own lives. How can social learning build upon people's own knowledge, skills and, often alternative ways of looking at the world? Social learning should focus on the process and the conditions needed to engage people in issues related to sustainability.

According to Colvin, Ballim, Chimbuya, Everard, Goss, Klarenberg, Ndlovu, Ncala and Weston (2008) two main approaches to capacity building can be distinguished within the Department of Water Affairs, one of which falls within a more traditional mould and the other within a more progressive mould. In the more traditional mould, there has been a strong emphasis on the development of guidance, with substantial volumes of guidance documents linked to the Strategic Framework for Water Services (2003) and the National Water Resource Strategy (RSA, 2004) being produced. This has also been coupled with development of training programmes. The authors argue that these approaches tend to assume an approach to learning that can be characterised as one-way and expert-driven (ibid.). However, recent initiatives seem to be progressing more towards interactive approaches to learning and this has led to increasing interest in social learning approaches to IWRM in South Africa (Cundill, 2010). These approaches to capacity building can be characterised as more 'progressive' in the sense that they assume a model of learning which is both active and interactive. Such a model supports processes and 'making sense' of what is needed by working out how to apply national policy thinking in the context of local realities (Colvin et al. 2008; Pahl-Wostl & Hare, 2004; Pahl-Wostl, 2006). Social learning approaches not only facilitate the development of a shared vision for the Water Management Area, but also participation as empowerment rather than consultation. This is supported by Pahl-Wostl, Craps, Dewulf, Mostert, Tabara and Taillieu (2007) who contend that social learning in river basin management is needed to develop and sustain the capacity of different authorities, experts, interest groups, and the public to manage their river basins in a sustainable way and balance multiple and competing interests for the benefit of the social-ecological system as a whole. Social learning which has relevance to community learning in IWRM contexts is a new era of theory development in environmental education (Wals, 2007), a point which I discuss in section. 2.5.

Discussed below is what communities are learning through acquisition and participation in the respective community of practices.

#### **2.4.5.1 Working for Water community of practice**

The Working for Water project is implemented through the Community Works Programme which is a South African government inter-departmental Expanded Public Works Programme established in 1995 in an effort to address the problem of invasive alien plants and rehabilitate affected ecosystems (see Chapter 1, Section 1.5.4). Through the participation of the affected communities, the programme was designed to address a number of sustainable development issues in South Africa by employing and



training employed members of marginal communities (RSA, 2010). Training and education provided to workers which is accredited with the South Africa Qualifications Authority includes the following; Small, micro and medium enterprise development (SMMEs); First Aid; Safety and health education (HIV/AIDS); Values and ethics; Herbicide application; and Chainsaw management. Other training includes Financial management and Supervision; Occupational skills; Environmental management; Soil conservation (erosion control); Forestry and plantation management; Identification and control of invasive alien plants; River bank management; and Life Skills which is meant to help people secure other employment opportunities and assist them to identify possible career paths (RSA, 2010). Attached as Appendix I, are copies of certificates given to recipients of facilitated training.

#### **2.4.5.2 Water for Food community of practice**

Through facilitated training interventions, extension support services, social interactions and exchange visits, the Water for Food community of practice is acquiring a number of skills to enable the group members to fully undertake their water related activities. Knowledge gained covers the following areas; rainwater harvesting concept (which includes collection, conveyance, and storage); methods of water treatment; garden development (use of trench beds) and management; soil conservation practices (including soil fertility improvement and erosion control), vegetable growing; marketing and business skills; recycling of household water; for example, water used for washing can be used to grow plants; how surface run-off can be turned into 'run-on' and channelled to ditches around garden beds and; an underground rainwater harvesting tank can store enough water for year-round vegetable and fruit production, or for other productive uses; and clean water harvested from the roof into an above-ground water tank can be used for drinking and cooking, and also the installation of above-ground water tanks and construction of underground rainwater harvesting tanks. Other information includes intensive food production methods, which are all organic and require no cash expense for fertilisers or water (Umhlaba, 2008).

#### **2.4.5.3 Cata Agricultural Project community of practice**

Through training programmes conducted by service providers, the workers under the irrigation scheme are provided with skills in rainwater harvesting; flood and sprinkler irrigation methods; soil conservation practices such as erosion control, soil fertility improvement and weed control and; farm management.

Other skills acquired cover areas such as herbicide application; river bank management; business management; food and hygiene; health education and occupational skills.

## **2.5 THEORIES OF LEARNING**

Smith (2003) noted that most of the ways people have talked about education and learning are based on the assumption that learning is something that individuals do, which has a beginning and an end; that is separated from the rest of our activities and that it is the result of teaching. Critiques of this approach have led to a new genre of learning theory research, namely social or situated learning. Theorists such as Lave and Wenger (1991) proposed that learning is an everyday process and that it is a process of engagement in a community of practice (Wenger, 1998). This turn to situated and relational theories of learning in the late 1980's represented a major shift in understanding of learning and knowledge. It followed the failure of cognitive science to demonstrate that 'learning' was the accumulation of symbolic representations which could be replicated using artificial intelligence and taught using intelligent tutoring systems (Handley, Sturdy, Fincham & Clark, 2006). This idea was acknowledged by Philips and Soltis (2004) who noted that it is not possible to come up with a single definition of what learning entails. They argued that there are different forms of learning; hence the existence of many definitions of what constitutes learning.

Previous approaches proposed that learning is the result of a change in cognitive behaviour or an internal process that results from external stimuli within the environment. This theory is based on a view that knowledge is hierarchically structured, with complex ideas being built on basic foundations, which are transmitted to the student through the mediation of the qualified teachers who are subject specialists (Fuller, 2007). Social and situated learning theory, argues that the cognitivist focus on abstract knowledge is misleading because it overlooks the largely tacit dimension of workplace (and other) practice. The suggestion is that individual learning should be thought of as emergent, involving opportunities to participate in the practices of the community as well as the development of an identity which provides a sense of belonging and commitment (Handley et al., 2006). One of the key aspects in social and situated learning is communication and participation, as opposed to a focus on behavioural changes, skills development, training, cognitive development and intelligence (Downsborough, 2009). Becket and Hager (2002) further argue that knowledge is not primarily abstract and symbolic, but is provisional, mediated and socially-constructed. There has been an increased use of social learning concepts in adult education to teach citizenship. The belief is that good citizenship can be learned, not

from formal curriculum but instead through positive experiences of active involvement within society. This approach stresses the importance of creating adequate conditions to link, experiences, reflection and experimentation between individuals and groups (Reed, Evely, Cundill, Fazey, Laing, Newig, Parrish, Prell, Raymond & Stringer, 2010).

People learn from their experiences in the world by reading, experimenting, painting, attending performances, experiencing field trips, thinking and reflecting, engaging in conversations and discussions and making connections between experiences (Wenger, 1998; Lotz-Sisitka, 2011). One of the most recent developments within environmental education has been to focus on more participatory and community driven approaches to learning and education (Babikwa, 2004). The central notion behind these processes is that people learn together with other people. In other words, learning takes place in social situations, which I discuss next.

## **2.6 A SOCIAL THEORY OF LEARNING**

Wals et al. (2009) caution that there is a need for more clarity on the meaning of social learning in order to prevent everything people do together in interaction being called social learning. They describe social learning as a process in which people are stimulated to reflect upon implicit assumptions and frames of reference, in order to create room for new perspectives and actions. They argue that the most important characteristics of social learning are:

- It is about learning from each other together;
- It is assumed that we can learn more from each other if we do not all think alike or act alike, in other words: we learn more in heterogeneous groups than we do in homogenous groups;
- It is about creating trust and social cohesion, precisely in order to become more accepting and to make use of the different ways in which people view the world; and
- It is about collective meaning making and sense making (p. 11).

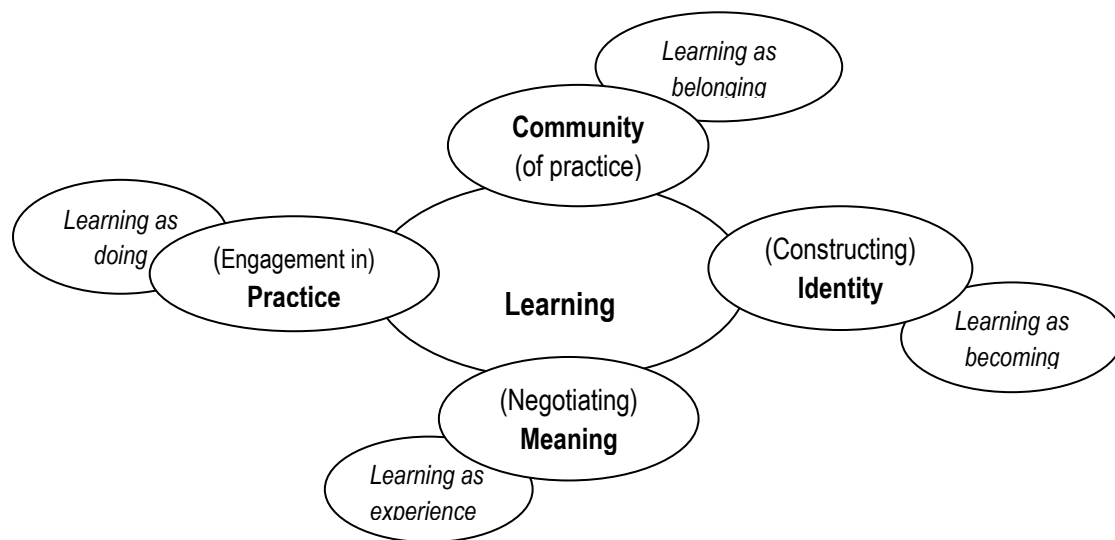
According to Smith (1999), in social and situated learning, learning happens through interactions and observations that take place between people and the environment in which they live in. Lotz-Sisitka (2011) acknowledges that learning occurs in a variety of ways and settings, formal and informal, as individuals and as groups, consciously and unconsciously. Everyday occurrences and experiences teach us knowledge, and a lot of effort is invested by most societies in teaching its members shared

conventions such as language or script (Lotz-Sisitka, 2011: 1). People learn through social interactions with others and through engagement in social practices. Social interactions can either take place through informal and/or formal processes such as meetings, training workshops, conversations and interactions with outsiders. Through these interactions, people build relationships with each other and develop into knowledge communities, whereby knowledge of resource management would lie with them as a resource (shared repertoire), which they can communicate and share with others. Interaction with and reaction to the environment plays a crucial part in everyday learning. Learning includes active reflection on experiences to integrate them with the existing stock of knowledge in society, drawing conclusions or generalizations from patterns, and generating predictions and expectations (Lotz-Sisitka, 2011). Smith (2003: unpagged) argues that:

There is no learning without participation. Learning becomes a social process dependent upon transactions with others placed within a context that resembles as closely as possible the practice environment. Knowledge is therefore created or negotiated through the interactions of the learner with others and the environment

Wenger (1998: 47) supports this further by arguing that the concept of practice connotes doing, and not just doing in and of itself, but in a historical and social context that gives structure and meaning to what we do. He describes learning as an integral and inseparable aspect of social practice.

Downsborough (2009) and Pesanayi (2009) working in similar contexts to understanding learning interactions found that people learn from their experiences in the world by experimenting, reading, experiencing field trips, thinking and reflecting, engaging in conversations and making connections between experiences. The primary focus of situated learning theory is on learning as a social participation. Participation refers to not just participating in local events and engaging in certain activities with certain people, but to a more encompassing process of being active participants in the practices of social communities and constructing identities in relation to these communities (Wenger, 2007). Therefore the concept of situatedness involves people being full participants in the world and in generating meaning (ibid.). A social theory of learning must therefore integrate the components necessary to characterise social participation as a process of learning and of knowing (see Figure 2.2).



**Figure 2.2:** Components of a social learning theory (Wenger, 1998: 5)

Although the community of practice concept has taken centre stage, it plays a subordinate, instrumental role in Wenger's social theory of learning. It enables the theory to focus on meaningfulness by locating learning within a social structure where its meaning can be collectively negotiated (Fuller, 2007). These components shown in Figure 2.2 above are interconnected and mutually defining and include:

- *Meaning*: a way of talking about our ability – individually and collectively – to experience our life and the world as meaningful.
- *Practice*: a way of talking about the shared historical and social resources, frameworks, and perspectives that can sustain mutual engagement in action.
- *Community*: a way of talking about the social configurations in which enterprises are defined as worth pursuing and our participation is recognisable as competence.
- *Identity*: a way of talking about how learning changes who we are and creates personal histories of becoming in the context of our communities (Wenger, 1998: 5).

Lave and Wenger (1991) define social learning as a process that takes place in a participation framework and not in one's individual mind. Therefore, learning is a process of social participation. Reid et al. (2008: 39) support this and argue that learning requires the active participation of learners to be achieved through extrinsic and intrinsic motivation or engaged participation. Wals (2007:39) amplifies

this notion and describes social learning as “learning that takes place when divergent interests, norms, values and constructions of reality meet in an environment that is conducive to meaningful interaction”. For learning to take place people need to be engaged in structures that enhance active interaction. Learning is an integral and inseparable aspect of social practice in the lived-in world (Pesanayi, 2008; Handley et al. 2006). Lave and Wenger (1991) describe learning as a process of participation in communities of practice which I discuss in more detail below.

### 2.6.1 Communities of Practice as an epistemological lens

The concept of community of practice invites a focus on learning as a collective, relational and a social process. This perspective is at odds with traditional theories of learning (as discussed in Section 2.4 above) preoccupied either with the mind and the ways in which learning results in changed mental states or with behaviour and how changes in behaviour can be brought about through the formula of stimulus-response (Fuller, 2007). A community of practice is a kind of community created over time by the sustained pursuit of a shared enterprise (rainwater harvesting). As we pursue different enterprises (food production, invasive alien plant removal and so forth.) we define these enterprises together (how it will be done). In this process we interact with each other and with the world, and we adapt our relations to each other and to the world, based on our interactions and experiences in the community of practice. In other words, we learn by doing – i.e. by interacting with each other in the doing (see Figure 4). In this learning is viewed as an aspect of all activity, as an integral part of the social practice (Lotz-Sisitka, 2011).

Wenger (2007) defines community of practice as groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly and suggests that a community of practice should have the following core elements:

- *Domain*. People organize around a *domain* of knowledge that gives members a sense of joint enterprise and brings them together. Members identify with the domain of knowledge and a joint undertaking that emerges from shared understanding of their situation (water management in the case of this study).
- *Community*. People function as a *community* through relationships of mutual engagement that bind members together into a social entity. They interact regularly and engage in joint activities that build relationship and trust (food production communities in the case of this study).

- *Practice*. It builds capability in its practice by developing a shared repertoire and resources such as tools, documents, routines, vocabulary, symbols, artefacts that embody the accumulated knowledge of the community. This shared repertoire serves as a foundation for future learning (p: 2) (IWRM practices in the case of this study).

In this study, the concept of community of practice (Wenger, 1998) has been used to understand the learning processes in Cata community (see Chapters 5 & 6). The research orientation and theoretical framework draws from Lave and Wenger's (1991) framework that reflects an underlying assumption of an epistemology grounded in shared practice. It allows for equal consideration of, and respect for the contributions of members of the community of practice under study, as they come from different backgrounds, and may bring in different experiences due to social dynamics such as migration and training (Pesanayi, 2008). Daniels (2008: 70) refers to this concept as "*distributed cognition*", whereby cognition is distributed among individuals and knowledge is socially constructed collaboratively, thus making it essential for a community of practice to share common resources. Masara (2010: 17) working in a similar context to understanding learning interactions found that:

Social learning in particular, intervention workshops is supported by different knowledge bases of participants. In the learning processes distributed knowledge – divergent nature culture views on the use of ecologically sensitive areas – existed and interacted in a learning process oriented towards understanding learning and sustainable development issues in the context of commercial beekeeping taking place in a complex social-ecological context. Such knowledge bases were the source of information for learning and constructing model solutions.

Benzie, Mavers, Somekh & Cisneros-Cohemour (2005) argue that the notion of community of practice provides a useful theoretical framework for researching social learning processes of groups in contexts such as local communities. Three relevant community of practices in Cata have been identified (see Section 1.5.4) because they share a concern, they learn together, with minimum support from outside, to address the problems of poor water quality and quantity in their community through IWRM practices (Phiri, 2011a). Janse van Rensburg and Lotz-Sisitka (2000), state that communities in context such as Cata community have a rich social fabric that develops and strengthens through social learning.

Through communities of practice, learners interpret, reflect, and form meaning. Community creates the environment for the social interaction needed to engage in dialogue with others to experience the various and diverse perspectives on any issue (Smith, 2003; Lave & Wenger, 1991). Community is the joining of practice with analysis and reflection to share the tacit understandings and to create shared

knowledge from the experiences among participants in a learning opportunity. Stein (1998) identifies practitioner knowledge and cultural knowledge as communities in which a new member must learn to perceive, interpret, and communicate experience through interactions with other members of that community. Community provides the opportunity for interaction, and participation provides the learner with the meaning of the experience.

Participation describes the interchange of ideas, attempts at problem solving, and engagement of learners with each other and the world (through practice). In this process we interact with each other and with the world, and we adapt our relations to each other and to the world, based on our interactions and experiences in the community of practice (Lotz-Sisitka, 2011: 5). It is the process of interaction with others that produces and establishes meaning systems amongst learners. Lave (1988) notes that, from a situated cognitive perspective, learning occurs in a social setting through dialogue with others in the community. She says learning is a process of reflecting, interpreting, and negotiating meaning among the participants of a community. Learning is the sharing of narratives produced by a group of learners (ibid.). Therefore, participating in community of practice gives rise to the opportunity for people to become knowledgeable practitioners through their co-participation but this outcome is not inevitable. Community of practice can create conditions which inhibit, or give rise to alternative learning outcomes (Lave & Wenger, 1991).

In a community of practice, members get involved in a set of relationships over time and communities develop around things that matter to people (Lave & Wenger, 1991; Wenger, 1998; Reed et al., 2010). The fact that they are organizing around some particular area of knowledge and activity gives members a sense of joint enterprise and identity. The interactions involved, and the ability to undertake larger or more complex activities and projects through cooperation, bind people together and help to facilitate relationships and trust (Wenger 1998). Community of practice is the context in which an individual develops the practices (including values, norms and relationships) and identities appropriate to that community. Tusting (2005: 36) maintains that the concept of 'social practice' offers a way of analysing human activity. Rather than focussing only on local activity, only on structures of thought or only on broader social structures, it offers us a way of conceptualising the socially situated nature of human activity. Smith (2003), citing Lave and Wenger (1991) describes learning as a deepening process which comes largely from our experiences of participating in daily life, with each other and with the world around us. Such learning is often termed 'situated learning' which is involved with community of practice.



### 2.6.1.1 Situated Learning

In a situated learning approach, knowledge and skills are learned in the contexts that reflect how information and skills are used and applied in everyday situations. “We learn through participating in our communities; in and through participation in practices; and in and through our organizations. We learn through being active participants in the practices of social communities, and through constructing our identities in relation to these communities” (Lotz-Sisitka, 2011: 3). Participation in learning in this set of learning theories is based on how one learns to participate in practices, using relationships, knowledge, language, culture, cognitive skills, values and prior experience and knowledge (ibid.). The idea is that learning can be more meaningful and effective for someone to learn about water resource management by actually going to the river, and that a student of archaeology by actually going to an archaeological site. This type of situated learning is termed ‘cognitive apprenticeship’ and involves the use of practical environment to place what is learned in the context of its usefulness (Smith, 2003; Lave & Wenger, 1991). As a consequence, forms of competent functioning are in many ways “locked” into the context in which they take place, thereby undermining traditional notions of transfer (Daniels, 2008).

Stein (1998: unpagged) states that situated learning has four major premises:

- Learning is grounded in the actions of everyday situations;
- Knowledge is acquired situationally and transfers only to similar situations;
- Learning is the result of the social process encompassing ways of thinking, perceiving, problem solving, and interacting; and
- Learning is not separated from the world of action but exists in robust, complex, social environments made up of actor, actions, and situations.

Participation is depicted as central to situated learning since it is through participation that the identity and practices develop. By participating in community of practice, a learner develops an awareness of that community’s practice and comes to understand and engage with various tools, language, role-definitions and other explicit artefacts as well as various implicit relations, tacit, conventions, and underlying assumptions and values (Handley et. al, 2006). Ibarra (1999) for example, has shown how individuals develop practices by observing others, imitating them, and then adapting and developing their own particular practices in ways which match not only the wider community norms, but their own individual sense of integrity and self. It is through participating in communities that individuals develop

and possibly adapt and thereby reconstruct their identities and practice (Brown & Duguid, 2001). Participation as Wenger (1998) maintains, refers not to just local events of engagement in certain activities with certain people, but to a more encompassing process of being active participants in the practices of social communities and constructing identities in relation to these communities. Participation is not just a physical action or event; it involves both action as well as connection. According to Lave and Wenger (1991), situated learning is based on the assumption that learning is social and comes largely from our experience of participating in daily life through a process of Legitimate Peripheral Participation. Situated learning in community of practice allows for an understanding of social learning processes through local actions, interactions and practices in community engagement in IWRM practices (see Chapters 5 & 6).

### **2.6.1.2 Legitimate Peripheral Participation**

According to Lave and Wenger (1991), learners inevitably participate in community of practice and the mastery of knowledge and skill requires newcomers to move towards full participation in the socio-cultural practices of a community through a process of legitimate peripheral participation. A process of legitimate peripheral participation is used to explain that when we start learning something new, we are always on the periphery (edge), and that as we learn, we gain more experience, develop our identities and gain membership of different kinds of knowledge communities (Lotz-Sisitka, 2011). Legitimate peripheral participation provides a way to speak about the relations between newcomers and old-timers, and about activities, identities, artefacts, and communities of knowledge and practice. Downsborough (2007 citing Benzie et al., 2005), suggests that the idea of legitimate peripheral participation emerged from the work done by Vygotsky that suggests that 'talk and interaction' assist learning. Vygotsky noted that through the social interaction with a supportive adult or peers, learners are able to move beyond their current range of ability and function at a high level. As a result, what can be understood and achieved by a group of learners working together can often be more than what any one learner could understand and achieve alone (ibid.). In communities of practice there are more experienced people, and others with less experience, and through the exchange of experience, those with less experience learn from those with more experience, and grow in confidence and competence over time. A person's intentions to learn are engaged and the meaning of learning is configured through the process of becoming a full participant in a socio-cultural practice. Learning involves participation in a community of practice (Handley et al., 2006).

However, as shown in Section 2.3.2, a number of factors that are contextual influence learning in community of practice as they determine the outcomes and success of participation. This entails that understanding participation in IWRM would require understanding the different contextual factors and their causal relationships since they influence and shape participation (Burt et al., 2006). A critical realist perspective provides a framework for explaining how effects are brought about (causations), knowing that there are different levels of causative factors influencing learning interactions and processes.

### **2.6.2 Critical Realist Theory as an ontological lens**

Learning in community of practice is influenced by structures that may either support the process and result in a positive change, or constrain the agency of people learning (Pesanayi, 2009). According to critical realism, the world is inherently transformative. Bhaskar (2008) argues for a depth ontology consisting of the real (mechanisms), actual (events) and empirical (experiences). At the level of the real, causal powers exist, that can instantiate actual events (and non-events). This leaves empirical traces that can be experienced.

Bhaskar's (1998) philosophy of critical realism, as its name suggests, is a realist philosophy, which is to say that it claims that a world outside and independent of our conscious perception exists (reality) and that only some aspects of this world are objectively knowable via our senses. He says our senses are not always completely reliable, for example, we can be fooled by illusions and we can misinterpret sense data. Nevertheless, because reality is independent of our senses, when we misperceive an event, the occurrence and properties of that event are independent of our perception and understanding and the cause of the event operates even if we are not aware of its operation. Bhaskar distinguishes between transitive and intransitive objects of knowledge in the world. Intransitive objects are the 'real things and structures, mechanisms and processes, events and possibilities of the world; and for the most part they are quite independent of us' (ibid). That is, the existence of an intransitive object does not depend on our knowledge or perception of it. Transitive objects, on the other hand, include theories, paradigms, models and methods. These objects are subjective and their existence is dependent on human activity (if people suddenly ceased to exist, transitive objects would cease to exist).

According to Sayer (2000) critical realism distinguishes not only the world and human experience of it, but between the real, the actual and the empirical. He explains how Bhaskar distinguishes the concepts in the following ways:

- The *real* is whatever exists, be it natural or social, regardless of whether it is an empirical object for us, and whether we happen to have an adequate understanding of its nature. The real is characterised by objects, their structures and causal powers; and these may be physical or social. It can be seen as the objective world.
- The *actual* is the reality that happens when the real is activated, and
- The *empirical* concerns the realm of human experience, that is the way in which either the real or the actual is subjectively experienced (see Table 2.1 below).

**Table 2.1: The three domains of reality: real, actual and empirical (Bhaskar, 1998: 41)**

	Domain of Real	Domain of Actual	Domain of Empirical
<b>Mechanisms</b>	✓		
<b>Events</b>	✓	✓	
<b>Experiences</b>	✓	✓	✓

Goff (2000) contends that behind events are structures and generative mechanisms that have enduring properties. A generative mechanism is the causal power that gives rise to something or the reason that something is. Bhaskar (1998) refers to generative mechanisms as *alethic truths*—the underlying processes that give rise to both actual and empirical events and the phenomena that scientists seek to identify. These mechanisms and structures instantiate actual events (and non-events), which leave empirical traces that can be observed or otherwise experienced. Therefore, mechanisms, events and experiences are all real. Events and experiences are also actual (because they are instantiations of the generative mechanisms). Finally, experiences are obtained via empirical traces of actual things, so experiences are also empirical.

### **2.6.2.1 Causation and causal analysis**

Lupele (2007: 79 citing Sayer, 2000) says one of the most distinctive features of critical realism is its analysis of causation. He states that what causes something to happen has nothing to do with the number of times we have observed it happening but that explanation depends on identifying causal mechanisms, how they work and discovery of the conditions under which they have been activated. Critical realism thus provides an open system theory for explaining how something is brought about, instead of reliance on simplistic cause-effect models, which ascribe an observable cause to every observable effect. Using causation and causal analysis, Pesanayi (2008) found that Bhaskar's method proposes that phenomena are identified, and then investigated and explanations are proposed and undergo empirical testing. The idea will be to find generative mechanisms and identify causal mechanisms and how they work, and discover if they have been activated and under what conditions (ibid.).

In this research, a critical realist perspective provided a way of explaining how effects are brought about (causations), through various causative factors that interface and influence peoples experiences (ibid.). The causal analysis, using Bhaskar's depth ontology, helped me understand various mechanisms and events that are influencing participation, learning interactions and opportunities in the three selected IWRM practices (see chapter 5).

In an analysis of the South Africa national scoping data for reviewing of participatory practice in IWRM, Lotz-Sisitka and Burt (2006) found that participation is a complex social process that is contextually influenced. It is influenced by a range of contextual factors and the causal relationships between these factors. The authors caution that understanding or establishing the "best practice" in IWRM would require careful contextual analyses of different contextual factors that influence and shape participation possibilities, and opportunities for participation (ibid: 73).

### **2.6.2.2 Power relations and conflicts**

Daniels (2008:98, quoting Hodkinsons, 2004) notes that, whilst Lave and Wenger (1991) are clear that there are significant issues of power and conflict in the process of becoming a full member of a community of practice, tensions arise between newcomers and full participants:

Unequal relations of power must be included more systematically in our analysis...It would be useful to understand better how these relations generate characteristically interstitial communities of practice and truncate possibilities for identities of mastery...

Any given attempt to analyse a form of learning through legitimate peripheral participation must involve analysis of the political and social organisation of that form, its historical development, and the effects of both of these on sustained possibilities for learning...

Thus participation in the cultural practice in which any knowledge exists is an epistemological principle of learning. The social structure of this practice, its power relations, and its conditions of legitimacy define possibilities for learning...

In addition to forms of membership and construction of identities, these terms and questions include the location and organisation mastery in communities; problems of power, access, and transparency; developmental cycles of communities of practice; change as part of what it means to be a community of practice; and its basis in the contradiction between continuity and displacement.

In understanding the learning interactions and processes in the various communities of practices, prior knowledge and information on what has already been done in the area of community participation and learning in IWRM was important. This provided literature on what exists and has been achieved. Section 2.7 below reveals what is already known about participation and learning in IWRM.

## **2.7 WHAT IS ALREADY KNOWN AND GAP IDENTIFICATION**

Downsborough (2009: 167), in her research study, noted that “learning does not stop once people leave formal education environments. People continue to learn over the course of their lifetime and people learn most of what they know outside of school and formal learning environments”. She further adds that there are often situations when people have gained knowledge and understanding from experiences outside of school where simple conversations and storytelling with friends and family members has provided insight and learning opportunities (ibid.). Using community of practice approach as a means to understand the learning and learning processes that were taking place in a citrus community, her study found that most learning about citrus farming and agricultural practices were noted to have come from within a family, mainly fathers and grandfathers and through the farmers’ own experience. She suggests that this is a kind of knowledge that is specific to the citrus farming community that has been passed on through generations (Downsborough, 2009). This was noted by Pesanayi (2008) working in a similar context to understanding learning interactions in rural farming communities of practice in Zimbabwe that non-formal and informal interactions between farmers and

their adult or non-adult relatives, and their neighbours in a community of practice had an influence on what farmers planted for food. He observed that the older members of the community appeared to command respect in one to one and group settings, not only because of the association between age and wisdom, but because their wisdom had also been seen to work in practice.

Downsborough also found that farmers learn from each other through their interactions and relationships with each other, with these interactions centred on issues of common interest. She argues that often times when farmers are faced with problems and uncertainties they get together, informally or formally and collectively discuss these issues (2009: 170). Wals and Heymann (2004) suggest that often when people are faced with challenges, conflicts and uncertainty, they tend to get together in an attempt to respond to and adapt to these situations.

Downsborough's study also found that networks and partnerships create an environment for learning through interactions. Lave and Wenger suggest that learning happens through the interactions and relationships people form over time. Field (2003, as cited in Downsborough, 2009: 171) notes that people make connections with people with whom they share an interest, and by making and maintaining these connections over time, people are able to work together to achieve things.

In her findings, Downsborough further indicated that when farmers were faced with challenges such as changes in marketing strategies and the implementation of new norms and standards, farmers came together as a community. The shared history and concern of the citrus farmers held the group together around the engagement of the risks and concerns, such as deregulation of the export market or changing legislation (Downsborough, 2009). She further argues that it is this shared concern that is key to the learning interactions and knowledge generation in the community (ibid.) This idea is supported by Wals (2007: 39) who argues that it is the diversity among a community of learners that brings about dissonance, uncertainties, ambivalence, risk, contestations and conflicts which are regarded by many scholars as fundamentals to social learning processes in a community if they are managed properly and brings about meaningful learning.

Pesanayi (2009) in his study found that multi-level learning interactions were key processes that shape and encourage learning. He found that learning in communities of practice is influenced by factors that may either support the learning process and result in a positive change, or constrain the agency of people learning in a community of practice. A number of underlying structures and causal mechanisms

were found to influence learning interactions and choices in these communities of practice including ambivalence, which influences the changing domain and practice. Factors such as climate change, drought and risk were found to affect farmer practice, while power relations affect the community, its practice, domain, sponsorship and the learning interactions in the community of practice. Pesanayi's (2009: 67) study showed that political economy had a profound effect on domain and practice.

The study also revealed that learning processes oriented towards capability for risk negotiation in the everyday involve intergenerational knowledge sharing, drawing on new knowledge from training interventions, process of trial and error, and dealing with ambivalent messages and uncertainties through reflexive processes of dialogue and social interaction, and this provided an understanding of the process of building capability for risk negotiation (Pesanayi, 2009). The study also showed that vulnerable communities are sources of knowledge for adaptation strategies to climate change, if their socially constructed knowledge is valued, if the power of distributed cognition that exists in community of practice can be mobilised (ibid.).

Masara's (2010) study on social learning in the commercialisation of natural resource products (commercial beekeeping) revealed that learning is internally and externally influenced by socio-cultural, political and economic complexities. Social learning, in particular, through intervention workshops, was supported by different knowledge bases of participants (beekeepers, extension officers, trainers and development facilitators). In the learning processes distributed knowledge – divergent nature culture views on the use of ecologically sensitive areas – existed and interacted in a learning process oriented towards understanding learning and sustainable development issues in the context of commercial beekeeping taking place in a complex social-ecological context (Masara, 2010; Lotz-Sisitka, 2009). Such knowledge bases were the source of information for learning and constructing model solutions. The study viewed participation as a key process for expansive learning and provides tools to work with contradictions that arise from socio-cultural and historical dimensions of learning commercialisation of natural resources in a Southern African context (Masara, 2010).

In their research, Lotz-Sisitka and Burt (2006) indicated that through the water policy and associated legislation the South African government has transformed the water sector and made provision for a number of stakeholder platforms (Water User Associations and Catchment Management Forums) for public participation in IWRM. These new approaches and methodologies have been developed to promote participation of water users (especially local communities) and other stakeholders in water



resource management in their respective Catchment Management Areas. Water User Associations and Catchment Management Forums are the foundations through which the National Water Act envisages that participation will take place. However, establishment of these platforms does not necessarily guarantee that participation will actually take place. The authors caution that there is a need to develop a fuller understanding of how communities make use of the participatory structures that exist. Citing an example of a case in Tanzania, failure to work within the local cultures and existing practices led to problems with water management policy implementation, as communities returned to existing traditional water management practices and failed to make use of new structures for participation (ibid.).

The approach of supporting stakeholder participation at the lower level of catchment management is already being implemented in certain areas. Communities and other key stakeholders are participating in local water management structures and processes. These include structures (Water User Associations) created and supported by the policy and legislation frameworks whilst others are local structures that are focussed on existing water management practices. For example, the community of Cata is already involved and implementing sustainable water management practices through these local structures that have been developed around water management practices (see Sections 1.5.4, 2.4.5 and Chapter 4). These include rainwater harvesting for homestead gardens and household use, crop irrigation, riverbank and land management practices to control erosion as well as invasive alien plant removal from water catchment areas in order to address problems of poor water quality and quantity in their area (Phiri, 2011a).

These water structures, through participation and learning are also aimed at building capacities of the stakeholders. Capacity-building is seen key to prepare people to participate in meaningful WRM processes. The study by Lotz-Sisitka and Burt (2006) also showed that capacity-building which is integral to the success of the IWRM process will be strengthened through engagement of stakeholders in participatory practices, through processes of situated learning.

As mentioned above, the Lotz-Sisitka and Burt (2006) study showed that participatory practice in IWRM is a complex social process that is contextually influenced and that plays out in different ways in different contexts (Lotz-Sisitka & Burt, 2006). Their study also identified different forms of participation which are associated with different purposes for participation.

Lotz-Sisitka and Burt (ibid.) recommended that further research is needed to conceptualise and support development of capacity as an integral aspect of participatory processes. There is a need to look into the relationship between participatory practices and capacity development in order to strengthen IWRM practice (ibid.). Capacity-building amongst communities is key to the sustainable development and effective implementation of projects and programmes at community level. However, what then are the strategies or best practices that can promote and support sustainable capacity-building initiatives?

Burt and Berold (2011) in a recent study found that in general research knowledge in South Africa “is not presented in a way that is understandable to non-specialists” which points to a ‘hegemony’ or dominance in scientific discourse that does not reach the audience it is aimed at. One of the key findings is that learning resources are more likely to be used when developed “*with* people rather than *for* people” (Burt & Berold 2011: 6). This shifts the power gradient from addressing people’s needs (we know what you need) to creating a space for the development of opportunities (let us work together and listen to what you need) (ibid.). Developing resources in partnership with communities, places water issues alongside other local issues such as agriculture, health and legal rights (ibid.). Various stakeholders then have an opportunity to voice their different interests. The acknowledgment of multiple perspectives “...offers significant opportunities for enabling a process of social learning to develop” (Collins, Blackmore, Morris, & Watson, 2007: 572). Power relations also play out in the dissemination of learning resources where “some resources can be misused as ‘Public Relations’ for government departments or other institutions” (Burt & Berold, 2011: 3). Sensitive and knowledgeable mediators are shown to be very effective in facilitating the learning of water practices but one must be critical and reflexive as to how they go about this and what power relations are embedded in these relations. As argued by Daniels (2008: 62), it is vital to consider the relations of power and control embedded in the production of cultural tools and their use. “The forces that go into the production of a cultural tool often play a major role in determining how it will be used” (Wertsch in Daniels 2008: 62). The study also found that developing a learning resource from the questions community members have themselves of rainwater harvesting practices is powerful but not without its problems. The authors cautioned that one must consider who was consulted when identifying questions in community contexts. One must also consider the power held by individuals who act as mediators and re-interpret “knowledge in a way that is relevant to a particular water practice and to those involved” (Burt & Berold 2011: 4). These insights are valuable to this study, which seeks to understand community questions in the context of how communities learn.

The authors Burt and Berold (2011: 3) observed that learning resources are more effective “when they engage learners with water issues as they experienced them, in their local context”. This was also found in two Dutch case studies, where researchers observed that knowledge creation must emerge out of the practices of stakeholders situated in their specific contexts (Jiggins, van Slobbe, & Roling, 2007: 533). They observed that “deliberately organised shared reflection” among stakeholders at different levels is important as this potentially leads to “an explicit awareness of the processes that are taking place, and hence of deeper capacity to design and manage such processes” (Jiggins et al., 2007: 533). Burt and Berold (2011) argue that these shared reflection spaces mediate learning and understanding, and that in the case of rainwater harvesting practices in a rural southern African context it is important to create these spaces for reflection in order to bring to peoples’ awareness the learning processes that are taking place within these practices. With a deeper understanding of their practices and the factors that effect and mediate them, individuals will hopefully have a deeper capacity to understand and work with the challenges posed by sustainable water management (Burt & Berold, 2011). This research project seeks to deepen understandings of these points made by Burt and Berold (2011) who note that there is a need for more in-depth empirical data to shed further light on the points being made in their research report.

In their study, Burt and Berold (2011) found too that knowledge construction and learning are always mediated; a point made by many other learning theorists amongst them Daniels (2008); Lave and Wenger (1998); Wals (2007) and others. They revealed that mediation was one of the main themes to emerge in their research. In this context a mediator is understood as an *individual* who “re-interpret[s] knowledge in a way that is relevant to a particular water practice and to those involved” (ibid: 4). In discussion groups involved in their IWRM study, many participants felt that “the best learning is direct human-to-human interaction” (Burt & Berold, 2011: 10). The mediation of knowledge, however, occurs on many different levels other than just through an individual. Knowledge is mediated in implicit (invisible) and explicit (visible/clearly defined) ways within the context of community-based water research management. Explicit mediation refers to mediation that mediates a specific category of reasoning (Daniels, 2008). An example of explicit mediation within water knowledge is the use of reports, learning resources and actual individuals who re-interpret knowledge in a specific way and aim to teach or inform through a particular category of reasoning. Various forms of media such as “hands on” written resources, multimedia booklets and media adverts mediate water knowledge (Burt & Berold, 2011: 5-8). Implicit mediation on the other hand is mediation that occurs in the discourses embedded in our every day lives (Daniels 2008: 6). An example of this would be the beliefs, traditions, norms, values

and socio-economic, political and religious institutions that mediate how community members learn and carry out their water practices.

Steyaert, Barzman, Billaud, Brives, Hubert, Olivier, and Roche (2007) in their study observed that environmental issues are seen as complex systems that are ever changing which then requires the need for collective action. This collective action mediates learning and knowledge in that understanding and agreements are co-constructed from a shared understanding of reality (Steyaert et al. 2007: 540). They argued that agreements formulated in this manner are more likely to be long-lasting (Steyaert et al., 2007). This is not unlike the theorising of Wals (2007), and is supported by Burt and Berold (2011: 6) who contend that when learning resources are co-produced with communities they are more likely to be relevant and used because those that have to use them are familiar with them, their assumption being that local knowledge and practice or action mediates knowledge and learning within water resource management. Working toward more sustainable use and management of water resources requires changes that will most likely emerge from “action, social relations, and experiences that take place locally where interdependencies can be explored practically” (Steyaert et al., 2007: 540). It would therefore seem important to acknowledge local knowledge and experience because this is where individuals have practical experience with the objects (water resources) and processes that need to be learned about and managed; an issue which this study will focus on.

My concern for researching ‘learning in communities’ is supported by Rickinson (2006: 46) who notes that environmental learning has been under-researched and under-theorised in the field of Environmental Education. He notes that much emphasis has been on what the teachers teach and on learning outcomes and very little research has been conducted on learning process, learner’s experiences, learning theories and learners’ response to environmental programmes. This view is also shared by Shumba et al. who maintain that although what is learnt is equally important, what is also key is the *process* through which that *knowledge* is generated and acquired, as it determines the relevance and quality of learning (Shumba et al., 2008). As indicated in Chapter 1, though my interest is on understanding what communities learn, my emphasis is on how (process) they learn through participating in IWRM practices.

## **2.8 SUMMARY AND CONCLUSION**

In this chapter I have presented literature on the reforms in the water sector in South Africa to promote public participation. I have also tried to situate the research within social and situated orientations to learning as the research study is interested in understanding learning interactions in communities of practice. The chapter also reviewed literature pertaining to situated learning and legitimate peripheral participation as a means to understanding social learning processes through local actions, interactions and practices in community engagement in IWRM practices. The chapter further outlined how critical realism theory has been used to investigate the various mechanisms and events that influence participation and learning interactions as well as providing insights from research that has been undertaken in similar contexts.

## **CHAPTER 3**

### **RESEARCH METHODOLOGY**

#### **3.1 CHAPTER OVERVIEW**

This chapter presents a discussion of the research methodology and the theoretical orientation used in this study. To gain a deeper understanding of how communities learn as they participate in IWRM practices, a case study methodology approach, under-laboured with critical realist ontological analysis was used. The chapter also describes why a case study approach was used. The chapter describes the methods of data collection, management and analysis. It also discusses issues of validity and trustworthiness, research ethics, limitations of the study and how each of them was addressed.

#### **3.2 THEORETICAL AND METHODOLOGICAL ORIENTATION**

As the research is focussing on developing deeper understanding of community learning processes in IWRM practices (see Section 1.5.4), I drew on 'situated learning' and 'legitimate peripheral participation' in community of practice as tools for understanding social learning processes (see Chapter 2). As indicated in Chapter 2, Lave and Wenger (1991), state that situated learning is based on the assumption that learning is social and comes largely from our experience of participating in daily life through a process of legitimate peripheral participation. Participation as Wenger (1998) maintains, refers not just to local events of engagement in certain activities with certain people, but to a more encompassing process of being active participants in the practices of social communities and constructing identities in relation to these communities. This has methodological implications as it requires in-depth, sociological analysis.

Bhaskar (2008) argues that the world is inherently transformative with generative mechanisms (with causal powers) that instantiate actual events (and non-events) and leaves empirical traces that can be experienced. These causal powers can be contextual factors such as poverty, power relations, policies, language, inadequate quality education and tensions and contradictions that influence how participation and learning takes place in communities of practice (Wenger, 2007; Pesanayi, 2008) (see Section 2.4.3). Therefore, understanding the various mechanisms and events that influence participation and learning opportunities are important for furthering learning and participation in community-based IWRM

practices, projects and programmes. This requires what Sayer (2000) refers to as 'intrinsic' or in-depth research best served by a case study research design.

### **3.3 CASE STUDY METHOD**

The study used a critical realist case study design as methodology. A case study allows the researcher to investigate a case within its real context. Critical realism allows for in-depth probing of generative causal mechanisms influencing the empirical and actual experiences evident in the case. According to Yin (2003), a case study is an in-depth investigation of an individual, group, incident, situation or community giving detailed account of the case under scrutiny. Cohen, Manion and Morrison (2007: 253) argue that case studies have several hallmarks: they are able to blend a description of events with the analysis of them; they focus on individuals or groups of people; they are able to highlight specific events that are relevant to the case and the researcher is integrally involved in the case.

However, Cohen et al. (2007) do not describe case study research with a critical realist frame. Case study research in a critical realist frame, allows for detailed capturing of empirical experiences of people in a social context and the events that shape these experiences. Furthermore, through abductive and retroductive analysis (see Section 3.5.2 below) generative causal mechanisms can be probed and identified as further contributing to the experiences and events (see Section 2.6.2.1).

As indicated in Chapter 1, this case study focusing on community learning was undertaken in a rural Eastern Cape community, Cata. The case study approach was appropriate because to understand the processes of community learning, I needed to situate myself within their context to gain in-depth perspectives on this research object (see Section 1.5).

As indicated in Section 1.5.4, this study focussed on the learning processes associated with selected IWRM practices in the Cata community. The water management practices identified included 1) the Water for Food community of practice - rainwater harvesting for homestead gardens; 2) the Cata agriculture project community of practice - rainwater harvesting for irrigation scheme and; 3) the Working for Water invasive alien plant removal community of practice. The case study on this community not only allowed me to understand the social learning processes through participating in selected IWRM practices, but also helped me in understanding the various mechanisms and events that influence participation and learning opportunities in more depth (see Chapters 4, 5 and 6).

### **3.4 DATA COLLECTION TECHNIQUES**

Multiple data collection techniques were used for this research study in order to enhance trustworthiness and also allow for triangulation of data sources. Lupele (2004) noted that each type of data has strengths and weaknesses and using them in combination increases the validity of the study, as the strengths of one approach compensate for the weakness of another approach. This is also amplified by Patton (2002: 248) who argues that using multiple methods allows inquiry into a research question with an 'arsenal of methods' that have non overlapping weaknesses in addition to their complementary strengths. In summary the research methods used in this study included:

- Document analysis,
- Key informant interviews,
- Semi-structured interviews,
- Focus group discussions, and
- Participant observations of water management events and practices.

#### **3.4.1 Document Analysis**

To contextualise the study and to evaluate work done by other researchers, related primary and secondary data sources in the form of reports, minutes of meetings and government publications were sourced and examined. A systematic review of the relevant documents provided information on national water policy and legislation requirements, biophysical characteristics and history of the study area, and the establishment processes and functions of local water management institutions. Yin (2003) advises that a systematic search for the relevant documents was important as a data collection plan (Yin, 2003). According to Patton (1990) documents serve two purposes: they are a basic source of information about the programme decisions, and background and activities; and secondly, they can give the investigator (researcher) ideas about important questions to pursue through more direct observations and interviewing.

As a result, during this analysis documents were classified into two sources; primary and secondary sources. Primary documents are those documents that have had a direct physical relationship with the events being constructed while secondary sources do not bear a direct relationship with the event (Cohen, et al., 2000). Some of the primary documents reviewed include the contextual profile study



reports on Cata, Working for Water project document, training materials, minutes of meetings and Cata (L1-7); and secondary sources included some research reports that had specific relevance to the research (referenced in Chapter 2). A list of all documents reviewed and analysed is included below in Table 3.1, with index codes that I assigned to documents for easier access and information retrieval.

**Table 3.1: List of documents analysed**

<b>Name of Document</b>	<b>What the document Provided</b>	<b>Index code</b>
Cata – A former homeland affected by Betterment, Eastern Cape, South Africa	Historical and cultural information of the people of Cata including the consequences of the ‘Betterment’ planning	L1
EPWP Training Strategy, Phase 2 (Department of Public Works, 2008)	Purpose and approaches to training within Expanded Public Works Programme	L2
Chainsaw Training Manual	Purpose and development in Chainsaw training, operation and management for the eradication of intruder plants	L3
Contextual Profile on Cata	Insights on the three selected IWRM practices taking place in Cata	L4
The Cata Story	Provides contextual information on Cata community both before the development process and the prevailing development discourse	L5
A critical review of learning support materials to Catchments, Sustainability and the Reserve	Purpose and approaches of capacity-building amongst stakeholders involved in IWRM in Water Management Areas	L6
Minutes of Annual General Meeting	Proceedings of the Annual General Meeting for the Cata Communal Property Association for 2011 which includes information from all developmental activities taking place in Cata Village	CAM
A Critical Review of Participatory Practice in Integrated Water Resource Management	A review of participatory practices in IWRM in South Africa as well as drawing on examples within the region and internationally	L7

The documents had different values in the research process, providing different types of insights contributing to the research question (Yin, 2003). I carefully read and reviewed each document and extracted all the information relevant to participation and learning. They helped in understanding the local history of how the local people were practising IWRM in Cata. For example the Working for Water project document assisted me to understand the purpose of the project and its objectives which included training and employment creation amongst others. The analysis of the provider’s learning support materials gave me insight to what is taught and how it is recontextualised and put into practice (see Chapters 4 and 5).

### **3.4.2 Selection of informants and participants**

Following a meeting with the Administrator of the Cata Communal Property Association (community-owned association which holds, manages, develops and administers land within Cata on behalf of the community) on the purpose of the study, I was directed towards some of the key people with whom she had already made contact. These were people who were either involved in the identified IWRM practices taking place in Cata (see Section 1.5.4) or those who had knowledge on the development initiatives going on in Cata and had information on the topic at hand (research question). With the permission of the Cata Communal Property Association, I then met with the identified informants and participants. It was easier to relate to most of the identified informants and participants as I had previously met most of them during my contextual profiling assignment of the community-based integrated water resource management practices in Cata.

Through these interactions, key individuals (informants) and participants emerged for the study. The identified informants and participants constituted the different structures within the area and were valuable sources of information. As for the Amatole District Municipality, the identified informant was the officer who is in charge of water management and provision in the Cata Village. Under the Department of Water Affairs, the designated informant is also in charge of the Working for Water Programme for the Amathlathi Municipality of Amatole District Municipality in which Cata Village is constituted.

### **3.4.3 Key informant interviews and semi-structured interviews**

Key informant interview refers to getting information from an individual or people who are considered to be particularly knowledgeable about the topic of interest. Key informant interviews were conducted with five people from; the Department of Water Affairs, Amatole District Municipality, Cata Communal Property Association and two elders from Cata community. These people provided information on the Working for Water project, structures for community participation at catchment level, operations of the Cata Communal Property Association and cultural history of the Cata people. It is worth mentioning that some key informants, particularly one elder from the community, was hesitant to give out information especially as it pertained to the historical data of the Cata people. He said the discussion on the history of Cata people, more especially the effects of 'Betterment' (see Section 1.5.3), were very sensitive to him. Data missed out on this discussion was generated through reviewing literature on the history of the Cata people and by undertaking a key informant interview with a second elder.

Semi-structured interviews were undertaken with four people who were involved in the three selected IWRM practices (see Section 1.5.4). Interviews may be structured or unstructured and are termed unstructured when they are open-ended and have greater flexibility and freedom (Cohen, et al., 2002). Semi-structured interviews are flexible with room for probing more information (ibid.). The interview questions which were designed prior to the interviews, only acted as guidelines in generating data as more follow up questions were undertaken. In this study semi-structured interviews were utilised so as to enable the researcher to understand the ideas of the informants without predetermining them. This approach is supported by Patton (2002: 21) who argues that the purpose of gathering responses to open-ended questions is to enable the researcher to understand and capture the points of view of other people without predetermining those points of view through prior selection of questionnaire categories. The approach also helped me to further probe and search for more detail and meaning. The duration of the interviews varied between 25 to 43 minutes depending on the time it took for people to respond to the questions. All semi structured interviews were conducted by the researcher. With permission from respondents, all interviews apart from one with the Amatole District Municipality were audio-recorded. Copies of an interview schedule, transcribed key informant and semi-structured interviews with respondents from the Department of Water Affairs, Working for Water project, Cata Agricultural Project and Water for Food group are attached as Appendices II, III, IV, V & VI. Listed below in Table 3.2 is a list of interviews including the dates when they were undertaken.

**Table 3.2: List of interviews including the dates when they were undertaken**

Interview	Purpose	Date
<b>Semi-Structured Interviews (SS)</b>		
S1 (Working for Water Contractor)	To source for data pertaining to the Working for Water project community of practice in Cata	28 <sup>th</sup> June 2011
S2 (Cata Agricultural Project Supervisor)	To source for data pertaining to the Cata Irrigation Project community of practice	28 <sup>th</sup> June 2011
S3 (Cata Agricultural Project Manager)	To source for additional data pertaining to the Cata Irrigation Project community of practice and also as part of triangulation to the data sourced from SS2	29 <sup>th</sup> June 2011
S4 (Water for Food Coordinator)	For validation and member-checking of the data generated through focus group discussions	15 <sup>th</sup> Sept 2011
<b>Focus Group Discussions (FG)</b>		
FG1	To source for data on Water for Food community of practice in Skafu settlement of Cata Village	5 <sup>th</sup> July 2011
FG2	To source for data on Water for Food community of practice in Nyanga settlement of Cata Village	8 <sup>th</sup> July 2011
FG3	To source for additional data on Water for Food community of practice in Nyanga settlement of Cata Village	12 <sup>th</sup> July 2011

<b>Key Informant Interviews (KI)</b>		
K1 (Elder 1 from Cata Village)	To source for data on the cultural history of the Cata people	13 <sup>th</sup> July 2011
K2 (Elder 2 from Cata Village)	To source for additional data on the cultural history of the Cata people	14 <sup>th</sup> July 2011
K3 (Officer from Amatole District Municipality)	To source for data pertaining to water resource management and provision in the Cata Village	18 <sup>th</sup> July 2011
K4 (Deputy Director, DWA)	To source for additional data on the Working for Water project and also to source for data on government's policy framework on community participation in IWRM	1 <sup>st</sup> Sept 2011
K5 (Administrator, Cata Communal Property Association)	To source for data pertaining to the management and development of Cata as the Cata Communal Property Association coordinates all developmental issues. To also validate issues coming from semi-structured interviews as part of member-checking	15 <sup>th</sup> Sept 2011

### 3.4.4 Focus Group Discussions

According to Litosseliti (2003) a focus group is a research technique that collects data through group interaction and questions determined by a researcher on a topic. It is set up in order to explore specific topics, and individual views and experiences, through group interaction (ibid.). It is open and allows participants to query each other and explain themselves to each other. It has an ability to bring up valuable data on the extent of the diversities of the participants. What distinguishes a focus group from the broader category of group interviews is an emphasis on the interaction and stimulation among group participants themselves (ibid.). A Focus group typically consists of between six and ten participants, but the size can range from as few as four to as many as twelve (Goss & Leinbach, 1996). Smaller groups offer more opportunity for people to talk and more practice to set up and manage, as they can easily take place in less formal settings (ibid.).

Three focus group discussions were conducted in Skafu and Nyanga communities of Cata village, as shown in Table 3.2 above. Each focus group had a total of five participants per group and the duration of the discussions varied between 30 to 48 minutes depending on the time it took for participants to respond to the questions. Initially, I intended to conduct these focus group discussions in three communities namely Skafu, Nyanga and Ndela. However, I ended up conducting the focus group interviews in Skafu and Nyanga only because the Water for Food community of practice is non-existent in Ndela community. Therefore, two focus group discussions were conducted in Nyanga due to its larger size (more households) as compared to Skafu where only one focus group discussion was conducted.

The focus group discussions targeted groups of women involved in Water for Food homestead gardens. Focus group discussions were used for this group of respondents as the process allowed for flexibility in examining shared understandings of a range of topics with a variety of individuals (Litosseliti, 2003). For these groups, discussions were conducted by first seeking permission to record the deliberations using an audio recorder and employing the services of an interpreter from English to *isiXhosa* and vice versa, which was accepted. This allowed me to follow everything said by the respondents as I cannot speak *isiXhosa* the local language of the Cata community. All communication during the discussions was done in *isiXhosa* by a local interpreter who also took down the participants' responses. Although the focus group questions appeared unstructured, in reality they were carefully predetermined and sequenced to guide the discussions (Litosseliti, 2003) (Copy of interview questions for focus group discussions with participants from the Water for Food group are attached as Appendix VII). The recorded discussions were then transcribed from *isiXhosa* to English.

### **3.4.5 Observations**

According to Patton (2002: 22) observational data, especially participant observation permits the researcher to understand a program or treatment to an extent not entirely possible using only the insights of others obtained through interviews or documents. Observations helped me understand the selected IWRM practices that are being undertaken and also complemented insights of others obtained through interviews. Observations also helped me understand the social learning interactions taking place amongst practitioners. Observations were done at the Water for Food community of practice homestead gardens to see what type of rainwater harvesting equipment was being used, how the water was collected and stored, and what the collected water was used for and how they make use of the knowledge gained through training workshops. Four homestead gardens were visited (two sites per day) and these took place on the 6<sup>th</sup> and 7<sup>th</sup> July 2011. At the Working for Water community of practice work site, data captured included how communities remove the invasive alien plants and how they interact with each other and how do they put into practice what they have learned in facilitated training (only a day – 11<sup>th</sup> July 2011, was assigned for this activity). At the Cata Agricultural Project community of practice farm similar activities as those described under the Working for Water community of practice were observed. The observations were undertaken after conducting semi-structured interviews with the supervisor and manager of the farm on the 28<sup>th</sup> and 29<sup>th</sup> of June, 2011. I took note of all learning interactions, what people did and said. All observations were written in a note book and photographs

were used as a way to document some of the observations made. Attached as Appendix VIII are the observations conducted in the study.

### **3.5 DATA MANAGEMENT AND ANALYSIS**

#### **3.5.1 Data management**

As indicated in Section 3.4 above, multiple data collection techniques were used for this study. Information was transcribed from an audio-recorder, written notes and observation notes. Data from focus group discussions which was in *isiXhosa* was later sent to a translator who transcribed the information into English. After data collection was completed, I had generated data from nine transcribed individual interviews, three transcribed focus group discussions, observational information, photographs, minutes of an Annual General Meeting, field notes and documents. The raw data was then indexed in the following way for easy management and analysis.

- Key informant interviews (K1 – K5)
- Semi-structured interviews (S1 – S4)
- Focus group discussions (FG1, FG2 & FG3)
- Field Observations (FO)
- Minutes of AGM (CAM)
- Documents specific relevance to the data in this study (L1 – L7)

#### **3.5.2 Data Analysis**

Data analysis was done in three phases and involved uncovering patterns and trends in the data sets (Jackson, 2009). In this study, data analysis was an on-going process from the start of data collection. This is line with Silverman (2010), who notes that data analysis should start as you gather it.

Phase 1 data analysis involved an empirical interpretive analysis so as to develop valid conclusions which were inferred from the observations made as communities of practitioners interacted (Danermark et al., 2002). Empirical analysis allows one to review the data carefully to identify patterns and themes in the data (see Chapter 4). Abductive analysis constituted phase 2. This was achieved through interpreting and recontextualising phenomena that had been observed through social learning

processes so as to understand meaning as interpreted within the conceptual framework (ibid.) (see Chapter 5). Furthermore, a retroductive analysis approach was employed as phase 3 as it provided knowledge of transfactual conditions, structures and mechanisms that could be observed or experienced in the domains of actual and empirical (Danermark et al., 2002). This allowed for a critical realist causal analysis which was used to unravel the various mechanisms and events that influenced participation and learning opportunities in IWRM practices in the Cata community (see Chapter 5).

As a way of organising the data for analysis, I developed analytical memos based on the themes that emerged from the data and which were informed by the research question and goals (see Chapter 1). Looking deeply into the data, I formulated the categories, sub-categories and analytical memos (Table 3.3 below). These are used to structure Chapters 4 and 5.

**Table 3.3: A list of categories, sub-categories and analytic memos constructed**

<b>Categories</b>	<b>Sub-categories</b>	<b>Analytical Memo's constructed</b>
Learning	<ul style="list-style-type: none"> <li>▪ Learning Ways of practising</li> <li>▪ Learning Knowledge</li> <li>▪ Learning Opportunities</li> </ul>	<p><b>AM4:</b> Although learning has been shaped by external influence, most learning has been achieved through social interactions amongst communities of practitioners and with the practice</p> <p><b>AM5:</b> Learning takes place through facilitated training interventions</p>
Participation	<ul style="list-style-type: none"> <li>▪ Structures for participation</li> <li>▪ Reasons for participation</li> <li>▪ Participation processes</li> </ul>	<p><b>AM1:</b> Participating in a community of practice creates a platform for learning</p> <p><b>AM2:</b> Local structures for community participation and learning have developed around practice</p>
Mechanisms & Influences	<ul style="list-style-type: none"> <li>▪ Inadequate Quality Education</li> <li>▪ Language</li> <li>▪ Power Relations</li> <li>▪ Poverty</li> <li>▪ Policy &amp; Legislation</li> <li>▪ Employment</li> <li>▪ Tensions &amp; Contradictions</li> </ul>	<p><b>AM3:</b> There are a range of contextual factors and structural mechanisms that influence participation and learning in communities of practice</p>
Community Concerns	<ul style="list-style-type: none"> <li>▪ Need for prior knowledge on initiated projects</li> <li>▪ Involvement in decision-making processes</li> <li>▪ Training not specific to community needs</li> <li>▪ Use of English during facilitated trainings</li> <li>▪ Resource materials not locally</li> </ul>	

	<ul style="list-style-type: none"> <li>▪ contextualised</li> <li>▪ Valuing of local community knowledge</li> <li>▪ Low education levels affecting performance</li> </ul>	
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The refined categories used to structure Chapter 4 are presented in Section 4.1 in the next chapter.

### 3.6 VALIDITY AND TRUSTWORTHINESS

Patton (2002) advocates the use of triangulation by stating that triangulation strengthens a study by combining methods. To ensure the credibility and trustworthiness of my research study, triangulation of the data was done through using multiple data collecting techniques (document analysis, interviews, focus group discussions and observations) so as to check for the integrity of inferences drawn from multiple data sources. This is recognised by Cohen, et al. (2000) who argue that data credibility is achieved through honesty, depth, richness and scope of the data, together with the extent of triangulation and degree of objectivity of the researcher.

Case study approach (see Section 3.3 above) allows for an in-depth investigation of the phenomena under scrutiny, and requires a thick description technique to interpret the patterns, categories and themes that emerge in the study (see Chapter 4). I used thick description as a technique to show depth of interpretation and to add to the trustworthiness of the study (Bassey, 1999). In order to represent the data accurately, respondent's direct quotations were used as a way to present the data in depth. During the case study, data generation and analysis processes were guided by the research purpose, research questions and content. This is supported by Maxwell (1992) who notes that validity is not just about what methods one uses, but whether the data, accounts and conclusions made from those methods adhere to the purpose and context of the study.

Face validity, as described by Lather (1986), was an important validity criterion that was achieved through member checking. I conducted two feedback sessions with participants to verify the accuracy of interpretations of their discourse in interviews and focus group discussions. Further, I invited my Masters' colleagues and supervisors to critique data presentations at various stages (research proposal, research methodology, methods and preliminary data). I also ensured theoretical validity through consistent working with the theoretical framework of the study in relation to data, findings and



explanation (Maxwell, 1992). As a participant observer during field visitations self-reflexivity (Lather, 1986) was key to maintaining research validity.

### **3.7 ETHICAL CONSIDERATIONS**

Ethical concerns were at the forefront of the study and continued throughout all the stages. These are moral values and principles which guide and underpin the research process. As Mertens (2005) argues, ethical considerations should not only be done during research planning but should be an integral part of the entire research process. It should not be viewed as an afterthought. All ethical questions were addressed and observed beforehand and during data generation and collection. I met these ethical requirements through letters to seek consent to participating institutions and individuals before carrying out data collection. These institutions included the Amatole District Municipality, Department of Water Affairs and Cata Communal Property Association which also coordinates the three selected IWRM practices (see Section 1.5.4).

Respect for truth, respect for democracy and respect for persons is a useful way of thinking about ethics (Bassey, 1999). Respect for truth prompts researchers to take full account of the process of research and be truthful in data collection, analyses and reporting findings. I upheld the truth and respected the people with whom I worked.

Respect for democracy is concerned about the freedom of researchers and the freedom of research participants. Access to community members, government and other institutions was negotiated with relevant authorities (Appendix IX). In cases where interviews were conducted with individuals such as the two elders from the Cata community, written and verbal consent was sought and participants were assured that they could withdraw from the research should they so wish.

To address the issues of respect for persons in this research the following steps were taken: All personal data was secured or concealed and only made public behind the shield of anonymity (Denzin & Lincoln, 2003; Cohen & Manion, 1994). In this research study no names have been used and I have substituted them with index codes. I sought the participants consent to be interviewed and quoted, and member checked the data with them. Permission was sought to record the interviews before the interviews and the reason for recording was well explained to the participants (Jackson, 2009). Prior consent was also sought to take photographs of the participants. Another key ethical consideration in

my research study was that of language. Since the research study site was in an *isiXhosa* speaking area, permission to conduct interviews in English was negotiated and the use of a local translator was employed. This was to allow for the full participation of respondents who could not speak in English. However, all three focus group discussions were conducted in *isiXhosa*.

In this study the aims and nature of the research were made clear to the participants before undertaking the research. All participants were briefed about the purpose of the research and the expected duration and, their rights as participants in research before data collection (Jackson, 2009). Explanations were verbal, and were translated in detail while those who could read were given an introductory letter from Rhodes University describing the purpose of the research (see Appendix X).

### 3.8 LIMITATIONS OF THE STUDY

One of the limitations of the study was that since the site was in an *isiXhosa* speaking area, the interviews for focus group discussions were all conducted in *isiXhosa* as indicated above in Section 3.4.4. A local translator was used to translate the interview questions from English to *isiXhosa*. It was discovered from the transcribed data that the local translator had problems in translations and in a number of cases did not pose the questions correctly. As an example to illustrate this, the researcher had asked the translator to pose a follow-up question during discussions with FG1 and this is what was transcribed:

**Researcher:** Do they use the same water harvested for gardening for other domestic chores other than for gardening?

**Translator:** When water for gardening is finished what do you do?

**Respondent (FG1:1):** I keep monitoring the water not to be finished. When the water level is going down in the drums, I fill it with tap water because I don't want my garden to have no water.

This is a 'worst case' example, and such translation problems did affect the outcomes of the discussions. However, in response to these weaknesses in the data, I member checked the data carefully where the issues seemed important, and I also validated the data through member checking with the Water for Food community of practice coordinator and through reference to the available literature. A discussion with the coordinator of the Water for Food community of practice resulted in the following information:

**Researcher:** Do the members use the water harvested using the installed rain harvesting tanks for other purposes other than gardening?

**Coordinator:** The tanks that were provided by the Department of Agriculture and Border Rural Committee, and installed by Umhlaba Consulting are strictly for homestead gardens. Water for other domestic purposes must be from other sources such as municipality taps or each homestead should install its own water tank for other purposes. However, we have people who sometimes use the water from the garden tanks for other purposes, but that is not allowed and we discourage that habit from our members.

As shown above, the member checking and validation through other sources helped to address weaknesses identified in the original translation process.

Due to the nature and timeframe of the study (half thesis and one year), I decided to work with three IWRM practices which allowed me conduct three focus group discussions, five key informant interviews and four semi-structured interviews (see Sections 3.4.3 & 3.4.4 above). This helped me to build some working relationships with some participants. I was careful to consider the nature of the research and did not want to be overloaded with too much data and hence decided to limit the number of IWRM practices as well as working with a small group of participants. To deepen the depth and quality of some of the data, it might have been useful to work with a few more people who could have enabled me to gain more insight into learning processes.

There are also limitations working with a community of practice framework. For example, the community of practice framework does not adequately theorise power relations or the role of language in learning. It can also lead to problems of conservatism, due to its reliance on contextual/situated learning analysis which discounts wider knowledge and structural influences (Lotz-Sisitka, 2008). In this study I found that it was important to complement the community of practice analysis with critical realism so that I could understand other contextual factors that influence learning processes. In addition, communities of practice perspectives are associated with the notion of 'legitimate peripheral participation' (Lave & Wenger, 1991), which assumes that all so-called newcomers in a community of practice are novices who need apprenticeship before they can fully participate in the community of practice they are joining. Legitimate peripheral participation in this case would thus conflict with the idea of 'distributed cognition' described by Vygotsky (Daniels, 2008) (see Section 2.6.1) as observed among the members of communities of practice in this study.

### **3.9 CONCLUSION**

This chapter has presented an overview of how the research was conducted, the orientation of the study, the methodological framework and methods used to generate and analyse the data. It has also illuminated how issues of validity and trustworthiness, ethical considerations and, study limitations were addressed. The next chapter (Chapter 4) presents the findings obtained from the case study done.

## **CHAPTER 4**

### **PRACTICES, LEARNING INTERACTIONS AND KNOWLEDGE**

#### **4.1 INTRODUCTION**

The data presented in this chapter outline the findings of the case study focusing on community learning in IWRM. The organisation of this chapter is guided by the analytical memos I constructed (see Table 3.3, page 52), based on the themes that emerged from the data and which were informed by my research question and goals. In discussing the findings, I present data based on the following refined categories:

- Structures for community participation and learning,
- Community learning interactions in IWRM,
- Learning and IWRM in community contexts,
- Mechanisms influencing participation and learning,
- Reasons for community participation in IWRM practices,
- Community concerns and knowledge resources available for mediation and,
- Tensions and contradictions.

#### **4.2 STRUCTURES FOR COMMUNITY PARTICIPATION AND LEARNING**

As discussed in Chapter 1, Cata was arrived at as a study site due to the existing IWRM practices that are already in place in which community members are participating. Evidence from document analysis, interviews and observations show the following.

Document analysis revealed that a Water User Association is a statutory body of water users who wish to undertake water-related activities for their benefit. Membership of a Water Users Association is limited to registered water users as defined by the National Water Act, people who use water other than for domestic purposes (L6 & L7). Another platform proposed by the National Water Act of 1998 but which has not yet been established is the Catchment Management Forum. A Catchment Management Forum is a non statutory body with open membership. It can be established by a group of stakeholders who come together to address a particular issue. Once that issue has been addressed, the forum may

come to an end, or it may go on to tackle other issues. The role of Catchment Management Forum is open-ended. Each particular Catchment Management Forum has to respond to local issues. They are meant to be forums for local involvement of stakeholders (L7). However, platforms for community participation in Cata are the local management structures developed around a water resource management practice.

Evidence from interviews showed that apart from the Water User Association launched in 2010 (K3), no other structure for community participation at community level exists as proposed by the South African National Water Act of 1998. This was also evident in the following interview extract:

The Water User Association was previously an Irrigation Board which was solely for big commercial farmers but it has now been transformed. They constitute both former irrigation boards and other individual water users whether big or small (K4).

Through careful observations and interviews I also identified a number of water management communities of practices including the Working for Water community of practice; the Water for Food community of practice; and the Cata Agricultural Project community of practice in which communities participate (FO). Data from interviews showed that community members participate through becoming members of the group such as the Water for Food community of practice or if they are employed through the Working for Water community of practice or the Cata Agriculture Project community of practice through the Cata Communal Property Association. Community members wishing to be employed submit their names to the Cata Communal Property Association or to elected chairpersons in the four respective areas Skafu, Ndela, Nyanga and Qunde that constitute Cata village. This is evident in the following interview extracts:

Cata is divided into four areas which are spearheaded by Chairpersons. Each area has an enrolment list and people who need to be engaged in any activity in Cata register their names with the chairpersons. Qualifications are only needed for specific jobs and those jobs including their qualifications are advertised in schools, community hall, clinic and shops. So if a project requires a certain number of people, then each area chairperson is requested to submit a certain number of people to the Cata Communal Property Association for engagement. These names are then sent to the project that requires people (K5).

Community members wishing to be employed submit their names with the Cata Communal Property Association or elected chairpersons in their respective villages. Once a Working for Water project activity is initiated for instance, a list of would be workers is sourced from the Cata Communal Property Association to work on the Working for Water project. The Cata Communal Property Association coordinates all developmental programs in Cata (S1).

All community members in need of employment register their names with Cata Communal Property Association. When the Cata Agriculture Project is in need of more work-force, names of job seekers are obtained from the Cata Communal Property Association. However, apart from just getting people to be employed, skills that the Cata Agriculture Project requires are considered first (S3).

In short, Cata Communal Property Association coordinates all developmental programs in Cata village, and it is through this that local structures associated with the community based IWRM practices appear to have emerged. The three IWRM practices identified are described below.

#### **4.2.1 Water for Food community of practice**

Documents analysis revealed that the Water for Food community of practice is one of the existing local structures through which communities participate and learn at community level (L4, L5, CAM). It is a community of practice promoting the productive use of water for sustainable livelihoods, food security and shared growth, based on household rainwater harvesting reservoirs.

Through focus group discussions with members of the communities of practice, I discovered that the Water for Food group is involved in rainwater harvesting for homestead gardens (S4; FG1:3). It is a group of interested people who wish to capitalize experience, share and create new knowledge and innovations. The main focus of this particular group is sustainable use of water resources for food production within the concept of IWRM. According to data from focus group discussions (FG1:1; FG2:3; FG3:2), the Border Rural Committee introduced Water for Food movement home-gardening approaches in Cata, which included trench gardening and run-on rainwater harvesting in 2003. To date there are 21 families in Cata that are established and are farming 'Water for Food' gardens. The Water for Food group has developed strategies focusing on nutrition and home food production through rainwater harvested.

Through observations, I noticed that the Water for Food is an all women (mostly old women) structure, and is involved in home food production through rainwater harvested (see Figure 4.1 below). Although the group is an all women community of practice, both males and females of all ages help with the management of the groups' activities at their homesteads.



**Figure 4.1:** A Vegetable (cabbage & beetroot) garden at one of the homesteads in Skafu, Cata Village (Source, Denilson, 2011)

#### 4.2.2 Cata Agricultural Project community of practice

Documents analysed revealed that the Cata Agricultural Project is an example of a small holder irrigation scheme where land-rights holders have recently grouped their plots together with full-time, commercial farming in mind. The case revolves around a strong informal partnership between the Border Rural Committee and a local cooperative in the face of ongoing skills and profitability challenges (L5). The Scheme consists of 22.75 hectares, made up of 22 individual plots. The plot owners are members of the project. Institutionally a management committee was set up, including the project members, the Border Rural Committee, and the Cata Communal Property Association, with the intention of improving local participation in decision making and management processes (L5).

Evidence from interviews showed that the farm has 15 plot-holders who are actively involved in the irrigation scheme and the Border Rural Committee has employed a new farming mentor to give intensive support. The total work force employed by the irrigation scheme currently stands at 26 workers (S2; S3).

Data obtained through observations showed that the Cata Agricultural Irrigation Project is involved in a number of activities ranging from river water harvesting to flood irrigation and crop production. Shown below as Figure 4.2 is one of the activities taking place at the irrigation farm.





**Figure 4.2:** A crop of cabbage in one of the Cata Agricultural Project's fields

#### **4.2.3 Working for Water community of practice**

Through documents analysed and interviews, in Cata, the Working for Water project is implemented through the Community Works Programme which is part of the Expanded Public Works Programme. The Working for Water project aims at improving and securing water supplies through engaging local communities in the clearing of invasive alien plants (L2; L4 & K4). Although the main goal of the Working for Water project is to eradicate invasive alien plants in order to recover water, other objectives of the programme include the conservation of biological diversity, and empowerment of local communities through job creation (see Section 1.5.4) (L2; L4).

Evidence from interviews showed that communities participate in the Working for Water community of practice and are involved in clearing large tracts of invasive alien plants such as wattle and eucalyptus. This is evident through a citation from S1: "Community members are engaged to eradicate wattle forests and other alien plants from major water catchments areas, agriculture and grazing lands, and homesteads". This has resulted in increased water flow in the Cata River, which had nearly dried up as a result of the black wattle infestation. The programme has so far been labour-intensive where community members of Cata are employed by the Cata Communal Property Association working for those hired as contractors under the Working for Water community of practice. The contractors, who are drawn from local communities, direct and supervise the clearing process with their respective community members. The contractors are given contracts by the Working for Water project in collaboration and support of the Cata Communal Property Association. The Cata Communal Property Association is a community-owned association which holds, manages, develops and administers land within the Cata locality on behalf of the community (K5).

Data from observations also showed members of the community of practice working on the project's site clearing the black wattles from the water drainage areas (FO), as shown in Figure 4.3 below.



**Figure 4.3:** Communities employed under the Working for Water project clearing the black wattle along the water catchment areas

## **4.3 COMMUNITY LEARNING INTERACTIONS IN IWRM**

Through careful observation and interviews with members of the different communities of practice, I discovered that people are learning through social learning interactions with other community members as they engage in their daily water management and food production practices. Learning interactions take place through both informal and formal processes such as meetings, training workshops, conversations and interactions with outsiders. Described below are learning processes through which community members participating in the various communities of practices of Cata are interacting as they participate in the respective IWRM practices.

### **4.3.1 Facilitated training workshops**

Documents analysed revealed that people learn from 'external groups' or training programmes, and that these need to be contextualised in the local communities of practice (CAM, L4, and L5). Such support from facilitated training programmes is provided by the Working for Water project, the Border Rural Committee, the Cata Communal Property Association, the Department of Water Affairs, the Department of Agriculture and other rural development Non-Governmental Organisations. A quote from one of the analysed documents indicated that:

Prior to commencement of any form of work, the workers will undergo training in First Aid level 1, Health and Safety, Herbicide application, Chainsaw management and an Induction course.

Training is conducted by different service providers specialized in different expertise that are sourced by the Working for Water project. Other training areas include small business development, financial management and supervision, and machine operating. Training agencies used are accredited under South Africa Qualifications Authority (L4: 7).

I also discovered through interviews and focus group discussions that, for example, most of Water for Food group members of Cata underwent training in a programme at Matsepo in Pretoria. Information learnt included rainwater harvesting, improvement of soil fertility, erosion control and garden management and so forth (S4; FG1:1). Further information from participants during individual interviews also indicated that learning takes place through training workshops provided by consultants, also called service providers. For example, workers under the Working for Water project and Cata Agricultural project were provided with training in the practical use of chainsaws, herbicide application, first aid and others depending on what had been prepared by the Service Providers (S1; S2). This was evident in this citation from S2: “New workers are trained in their respective jobs such as pesticide control, furrow making by the Farm Manager. Workers both new and old are also trained by consultants hired by the National Development Agency”.

Through field observations (FO), I noticed that through facilitated learning, members of communities of practice come together to share experiences, best practices, lessons and challenges they were facing, for instance in their homestead gardens. The gatherings were platforms for learning opportunities.

#### **4.3.2 Exchange visits with other groups to share ideas**

I discovered that some communities of practice undertake exchange visits or study tours, as part of their learning process in order to improve their management practices. Data from interviews and focus group discussions showed that the Water for Food group from Cata meets with other groups from surrounding villages and areas such as Alice and Middledrift through facilitated workshops by the Department of Agriculture and Border Rural Committee at Fort Hare University.

The purpose of these workshops is to enable Water for Food groups to interact, exchange information, share lessons, best practices and experiences on rainwater harvesting, soil fertility improvement, erosion control and other gardening activities (S4, FG1:4; FG2:2). In social learning the interactions between people or groups of people are viewed as possibilities or opportunities for meaningful learning, as shown in this citation from S4.

The Water for Food groups from Cata meet with groups from other villages such as Middeldrift and Alice twice every year through facilitated workshops. The purpose is to exchange information, share lessons, practices and experiences on how they are doing. These exchange workshops are organised by the Department of Agriculture and NGOs.

#### **4.3.3 Meetings, social interactions and village conversations**

Documents analysed revealed that members of the communities of practices learn everyday through the social learning interactions with other community members as they engage in their daily social practices (L4 & L5). Learning occurs through meetings, social interactions and conversations within villages.

Through interviews, I also found out that members of the Water for Food group, for example, conduct formalized meetings once every month. They at times have ad hoc or informal meetings as the need arises to share information, knowledge and learn from one another. This is evident from the following interview extract.

Through formalised meetings members of Cata Water for Food groups meet once every month to share and learn from one another. However, some members usually have ad hoc meetings amongst themselves as need arise to share information, knowledge and learn from one another and from friends (S4).

Such meetings are very useful as they provide a platform and an opportunity for the group members to come together and discuss issues affecting them as a community of practice. This is indicated by examples of the interview citations: "If I as a member of the group experience some difficulties in my garden, I request for a meeting where I will raise my issues or problems and those that have experienced them before will help in addressing them" (S4). "We help each other as a group. As a group we go to the gardens of other members and look around to see how one is doing so that we can help each other" (FG2:3). Further evidence from a respondent during focus group discussions indicated that:

We meet as group members in the Cata hall and raise problems that we are facing and advise each other. For example, I have a leaking water tank and because I do not have water in the tank for watering the vegetables, I was advised to get water from the stream and/or tap by group members (FG3:4).

Another respondent (FG2:3) indicated that:

We do meet together all of us. Like now as we are about to plant, we collect the money every month from group members which we buy seedlings for the group. We share information amongst the group members of Water for Food but not with the other people who are non members.

Evidence from data also indicated that the management of the Cata Agriculture Project conducts bi-weekly meetings with workers where information and lessons are shared amongst workers and management. In addition an Annual General Meeting is also held at the Cata hall at which information about farm activities is discussed (CAM). Community members are given an opportunity to ask questions and any other issues pertaining to the farm operations (S2; S3) are discussed. In another instance, the Contractor for the Working for Water project also debriefs the workers regularly before the start of work as a way to bring all workers to the same platform and provide an opportunity for those who are struggling to ask questions as a way for them to learn (S1).

During my field visits I also observed at one homestead, members of the group discussing and sharing information on their garden activities as well as learning from each other (FO: 2) (see Figure 4.4 below).



**Figure 4.4:** Some members of the Nyanga Water for Food group discussing and sharing ideas during one of their ad hoc meetings at the homestead of one of the members.

#### 4.3.4 Intergenerational knowledge transfer

There was no data from documents analysed regarding intergenerational knowledge transfer. Evidence from interviews and focus group discussions with members of the different communities of practices indicated that people gain and pass on knowledge and skills to and from relatives. One member of the Water for Food community of practice indicated that she learnt the knowledge and skills on gardening from her parents: “I learnt gardening through my parents when I was still young” (FG2:2). Further evidence from the data obtained from a respondent during an interview indicated that: “This kind of

information we learn from other group members who attended a training workshop is also passed on to our families as they are the ones who actually do the work when we are not at home” (S4).

In this case study I also noted that people share stories about how life was where they came from and the pain resulting from the forced removals during the Betterment planning instituted by the Apartheid regime in the 1960s. This trend emerged during individual interviews of two elders on the history of the Cata people as shown in this citation from K2:

I share what we went through during the forceful movements by the apartheid regime with my children and grand children. I tell them in form of stories as a way of sharing and passing on the information to young ones so that they understand their history, tradition and culture. This will also keep them in touch with their ancestors...

This knowledge transfer process was witnessed through observations when I visited one of the homestead gardens where family members were helping in the preparation of trench beds for spinach (FO). I observed a member of the Water for Food group adding compost material and soil to the vegetable bed. What was interesting was that she was doing these activities with the help of her brother and two of her sons (FO) (see Figure 4.5 below). The family was helping in trench bed preparation as it is the source of their livelihood.



**Figure 4.5:** A family working together preparing a trench bed for spinach at a member's homestead.

#### 4.3.5 Learning through observations

Data from documents analysed revealed that members of the communities of practices also learn through observations and trying things out and experimenting with new ideas. Observing their trained colleagues working in their gardens allowed other members to copy ideas and practices and implement them at their homesteads (L5).

Evidence from interviews and focus group discussions also showed that members of the Water for Food community of practice that received formal training organized a practical demonstration for members that did not get trained at one of the trained member's homesteads. They demonstrated all that was learned in the training to other members of the group including their family members. This includes how rainwater is harvested (Figure 4.8, Section 4.4 below), how to control erosion and pests such as ntuku (mole), how to prepare trench beds for vegetables (Figure 4.5 above, Section 4.3.4), and how to improve the soil fertility of their gardens amongst others. Through practical demonstrations, interactions and observations, other members were also trained and replicated what they had learnt and observed at their homesteads (S4; FG1:1). A citation from a respondent indicated what members learn when they visit her homestead:

Some group members come to ask some questions about gardening and I show them things like how to prepare a trench vegetable garden. I show them that after digging the ground, you remove soil (*uhlalutye*) equivalent to five spades and put it aside. Then take two wheelbarrows of manure (*umgquba*) and mix it with soil you had put aside and put it back into the trench bed and the soil will be ready for planting (FG3:4).

Through this process learning has continued to take place among other group members through observations of how activities are done at other homesteads and then replicated at their homes in order to develop competence over time. Through observing others and imitating them, individuals have adapted and developed their own practices in ways which match their competences and skills. A respondent, who is a member of the Water for Food community of practice, explained how such learning occurred:

There were people from here who went for training in Pretoria at Matsepo. I got this idea about the project from my village as I am the committee member of the Cata Communal Property Association and I taught myself by visiting the gardens of other members with Zanele. I like the way they planted and I had no garden. I noticed that this thing is the one thing that I could do and started doing it after learning from the people who attended the training. I just learnt from them (FG1:1).

Another interview respondent FG2:3 also indicated that: "We also help each other as a group. As a group we go to the gardens of other members and look around to see how one is doing so that we can help each other".

Interview data also showed that learning took place through learners' observations of the trainers or facilitators and what they were doing and later learnt by doing exactly what they had observed. For example during the practical demonstration of how to use a chainsaw to cut a wattle, the trainer would demonstrate how to use the chainsaw and how a tree should be cut. In this way learners would observe and then replicate what they had just witnessed (S1). This is said to be the most effective learning process for most community members who attend facilitated training programmes as many of them cannot read and write and the language most often used in training workshops is English which they hardly understand.

Evidence from observational data (FO) also showed that some community members were trying other ways of doing things other than what they have observed or had been taught to them. This included trying new varieties of vegetables and learning through doing it themselves (Figure 4.6).



**Figure 4.6:** A homestead gardener watering a new vegetable variety she planted after observing and learning from other members

#### 4.3.6 Learning from others

Through documents analysed, it was evident that people were learning from others so as to develop competences. The Cata story (L5) showed how community members under the Cata Agricultural Project and the Water for Food group were learning IWRM practices such as river water harvesting, rainwater harvesting and soil conservation practices from others. Through visiting fellow member's homesteads to see what they were doing and by asking questions, they were also learning the practice.

The data collected through interviews and focus group discussions also showed that learning takes place through the apprenticeship approach i.e. learning from others. This is mainly done for slow learners and/ or new workers who are paired with old and experienced learners so that they learn from them and develop competences over time. An interview respondent explained that: "We identify those



workers who are doing perfectly well and pair them with slow learners or new workers with less experience so they can assist them to develop competences” (S1).

Another respondent also said:

We mix workers who can read and write with those workers that cannot so they work together. This is done more especially during spraying so that those who are able to read can assist those that cannot. We usually combine those with good education with those with low education (S2).

Further evidence from an interview respondent showed that the Cata Agriculture Project encourages the use of apprenticeship, where new workers are attached to old and experienced workers till they learn how to undertake the activities on their own (S3). In this process, the new members are learning and mastering the skill so as to gain membership of the Cata Agricultural Project community of practice.

At the Working for Water project site I observed workers using chainsaws to do the spacing in the wattle forest plantations whilst other workers were learning through observing. This was part of forest plantation management for the local community. Old and experienced workers were trimming the off-shoots from the main wattle branches and applying chemicals so that only the main branch grows up as these are meant for sale to timber loggers (FO). Through this process of learning from others through being taught the practice and trying it themselves, the new members were learning to do the practice and thereby becoming full members of that community of practice.

#### **4.3.7 Learning through printed text and literature**

Data from analysed documents revealed that members of communities of practice were learning through reading literature and printed text in the form of handbooks and training manuals (L2, L4 & L5). These resource materials were distributed to them mostly after facilitated training workshops and meetings.

Data from focus group discussions and interviews showed that, the Department of Water Affairs disseminated information to schools and learners in the Working for Water project areas through its 2020 project in the form of brochures, lessons, hands-on-activities and field trips. This information is then passed on to families and friends at home. Information disseminated included the effects invasive

alien plants such as black water, prickly pear and water hyacinth have on the environment and how to address such issues (K4). An analysis of these materials such as brochures on invasive alien plants provided the following information: the definition of what problem plants are; how to identify problem plants species; an explanation of the harmful effects that these plants have on the environment; a suitable method of control while taking relevant factors into consideration; advantages and disadvantages of the methods used were explained; and appropriate tools identified for the control of the problem plant.

Another respondent from a focus group discussion (FG2:1) said she learnt about how to control pests and erosion in her garden from the pamphlets and posters at the Cata museum hall. This kind of information including the history of the Cata people, the restitution programme due to betterment dispossession and activities of other communities of practice is provided on the notice board and is accessible to the community of Cata and the general public at the Cata museum hall. Information regarding what developmental activities (what has been undertaken and planned for) taking place in Cata was also provided through the minutes of the 2011 Annual General Meeting.

Through observations, during the visitation to the Working for Water project site I also noted the Contract Manager with a copy of the Chainsaw training manual. The manual provided information on how to operate and use a chainsaw machine; safety and maintenance procedures; when to use a chainsaw machine; and recommended ways of how to cut down trees using a chainsaw (FO). The Contract Manager kept referring to the manual as she was briefing the workers before the start of their work for the day.

#### **4.3.8 Extension workers facilitate learning**

It was evident from analysed documents that people learn from external groups through interactions with researchers, the Border Rural Committee, extension officers and other developmental organisations (L4 & L5). For example, CAM showed that in 2011, five employees of the Cata Agricultural Project had received training for herbicide and spraying from a consultant with support from the National Development Agency. These kinds of support provide possibilities and opportunities for learning.

It was evident from interviews for example that the Department of Agriculture and other developmental Non-Governmental Organisations provide learning opportunities through extensional support services. This is shown in the following citation from S4:

Sometimes we go to the Department of Agriculture to ask for help and they do assist us. The Department of Agriculture would send extension officers who come to help address technical issues being faced. We get extensional support and they teach us on how to manage our vegetables, how to improve on soil fertility and any other that we may having problems with. We discourage use of chemicals because as a group we promote usage of organic manure.

Another respondent indicated that: “We do get support from the agriculturalists (*abalimi*). When we request them, they do come and look around to see how we are progressing” (FG1:3). Another responded said:

We were visited by the water people (Department of Water Affairs and Umhlaba) and they trained us how to build pits and tanks for water harvesting and storage. It was a gift to us and now I am able to get water, to which I am very proud of because I am now getting something out of it (FG1:4).

This is knowledge that the workers acquire through external support as shown in this citation from S3: “Workers learn through trainings conducted by Consultants. Areas covered include pest identification, use of pesticides and spraying, fertiliser application, furrow making and flood irrigation”.

It was also evident through observations that the knowledge people acquire through external support like consultants was being put into practice. This was observed at the Cata Agricultural Project site, where workers were applying the knowledge gained to undertake work activities such as fertiliser and pesticide application (FO) as shown in Figure 4.7 below.



**Figure 4.7:** Workers applying pesticides to a crop of cabbage.

## 4.4 LEARNING AND IWRM IN COMMUNITY CONTEXTS

Data obtained through document analysis, interviews, focus group discussions and observations (L2; L4; L5; S1; S4, FG1:3; FG2:2; and FO) indicated that knowledge is gained by communities through training, practices and sharing of information amongst communities of practices. Knowledge learned is specific to a particular community of practice as it should be relevant and useful to that community of practice. Briefly described below is what communities learned in their respective communities of practice.

### 4.4.1 Water for Food community of practice

Data from documents analysed revealed that the Water for Food community of practice gained valuable knowledge relevant to their particular IWRM practice through the various learning interactions. Knowledge included the following; the rainwater harvesting concept (which include installation of a water harvesting tank and/or pit, water collection, conveyance, and storage methods); methods of water treatment; garden development and management (weeding, watering, pest identification and control, and use of trench beds); soil conservation practices (erosion control and soil fertility improvement through use of organic manure); recycling of household water for use in gardening; fruit and vegetable growing (L2; L4 & L5).

Evidence from interviews and focus group discussions showed that members of a community of practice acquired valuable knowledge through the various learning interactions. A respondent (S4) during interviews indicated that:

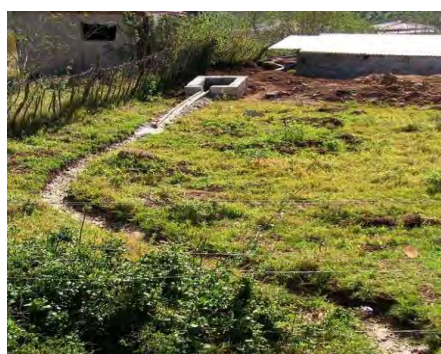
Training workshops have been very helpful. For example our soils are not rich in nutrients and so by implementing the activities on soil fertility and management that we learn from workshops, it has helped us improve the quality of our soils and this has resulted in improved production of our gardens.

It was also evident from focus group discussions that members of the community of practice had gained knowledge to enable them to undertake their IWRM practice. Interview extracts showed that: "We collect the water from the rain and store it in our tanks to water our vegetables. We also make manure through compost" (FG2:1). "I am now able to control pests especially the *ntuku* (mole) which was my biggest problem in my garden" (FG3:2).

Focus group discussions also showed that the members of the Water for Food community of practice have acquired basic marketing and business skills. A respondent ((FG3:3) indicated that:

I sell the vegetables and they give me money. I also use the vegetable as food at home. Therefore, I keep planting, selling and eating my vegetables. I keep my garden running to support my family with food and financially through the knowledge I have gained from trainings and others.

Through field observations (FO) which were captured using photographs, it was evident that members of this community of practice have gained knowledge through the various learning interactions. Shown below are photographs of the different activities communities are able to do through the knowledge gained from the various learning interactions (see Figures 4.8 & 4.9).



**Fig 4.8:** Rainwater harvesting to catchpit and 30,000 litre tank at one of the homesteads in Skafu, Cata Village (Source, Denilson, 2011)



**Fig 4.9:** Installed plastic rainwater harvesting tanks at one of the homesteads in Nyanga, Cata Village

#### **4.4.2 Working for Water community of practice**

Through documents analysed, data revealed that community members are being equipped with various skills to enable them undertake their water related activities (L2; L4 & L5). Data from training documents indicated that workers are being trained in the following; first aid, safety and health education (HIV/AIDS), values and ethics, herbicide application and chainsaw management. Other skills

provided to members included management and supervision, occupational skills, environmental management, forestry and plantation management, identification and control of invasive alien plants and life skills meant to equip the workers to look for more permanent jobs (L2 & L4).

It was also evident from interviews that people were gaining information which was relevant to their community of practice. Some respondents said:

We are trained how to eradicate wattle forests and other invasive alien plants from major water catchments areas, agriculture, grazing lands, and homesteads. Workers are also trained in other areas such as occupational skills, environmental awareness and health education, and life skills to empower them (S1).

These people get trained because when you recruit them you have to call your skills analyst to see what level of literacy and competency they have. We do undertake a skills assessment to establish what kind of training the people will need and the level of training... For example chainsaw training has to be provided because it is a very dangerous activity and is needed to do this kind of work under the Working for Water project. Other training provided includes training such as biological control (K4).

Evidence from observations (FO) also showed that community members congregated through activities that have been initiated and developed around a specific or particular IWRM practice. For example, observations during a field visitation to the Working for Water project site showed community members clearing the wattle and other alien plants along the water catchment areas. Other workers were trimming the off-shoots from the main wattle branches and applying chemicals to the cut surfaces of the alien plant. This is a kind of activity that the members of this community of practice have learnt over time through the various learning interactions.

#### **4.4.3 Cata Agriculture Project community of practice**

Data through document analysis showed that through training programmes conducted by service providers, the workers were provided with skills in rainwater harvesting, flood and sprinkler irrigation methods, soil conservation practices such as erosion control, soil fertility improvement and weed control and, farm management (L2; L4; L5 & CAM). Other skills acquired include herbicide application, river bank management, business management, food and hygiene, health education and occupational skills.

Evidence from interviews also indicated that the knowledge obtained by community members through learning interactions is intended to help them develop competences and best practices that will

enhance their socio-economic status and improve their quality of life. They are also life skills intended to prepare them even after their current work activities are over. This is evidenced by respondents from interviews who indicated that:

The trainings that I have acquired as a clerk recorder have given me skills in administration, management, and many others. Just a few weeks ago I got training in food and hygiene. Even if the project came to a close, I would still survive because of the qualifications and experience I have acquired so far (S2).

The farm workers have acquired life skills through trainings and job experience that they have at the Agricultural Project. People are trained in different skills which they use in the community. As for myself although I only have grade 10 education qualification, I have acquired skills through training provided that have helped me do the job as a manager (S3).

Data from observations also showed that community members under the Cata Agricultural Project have acquired knowledge through various learning processes (FO). During the site visitation of the Agricultural project I observed a number of activities showing what workers have learned and are practising as can be seen in the photographs shown above and Figures 4.10 & 4.11 below.



**Figure 4.10:** A worker applying fertiliser to a crop of cabbage at the Cata Agricultural Project farm



**Figure 4.11:** A worker preparing a field for crop planting at the Cata Agricultural Project farm

## 4.5 MECHANISMS INFLUENCING PARTICIPATION AND LEARNING

Data obtained through document analysis, interviews, focus group discussions and observations revealed that learning, a process of participation, is influenced by a number of factors that are contextual. Learning takes place between individuals, but contextual factors influence the way these interactions take place (L2; S1; S2 & FG1). Six contextual factors were identified, and are discussed in more detail below.

### 4.5.1 Use of English language

Data obtained through documents analysed indicated that use of English during facilitated training programmes does not always work, as not everyone understands what is being said or talked about (L2 & L6). Use of English as the mode of facilitation hampers participation as most workers cannot read and write in English and this is said to inhibit understanding and is a barrier to participation (a process of learning). It was noted that although translations are made into *isiXhosa*, all learning support materials are in English and this affects understanding as well as execution of their activities. This is illuminated during training workshops where facilitation is mostly done in English.

This is also evident in the resource materials (training materials) (L2 & L3), provided to members of different communities of practice. The resource materials are all in the English language and most of the community members cannot use them as they cannot understand them.

Evidence from interviews also showed that language barriers inhibit participation and work performance. As indicated by a respondent: “Most of my workers cannot speak or write in English which is mostly used by the trainers during workshops; so many of them cannot get much information and this affects their performance in the field” (S1). This was further supported by a respondent in an interview who explained that:

The use of English as a language during training is a serious barrier especially for low educational areas like Cata. Language is surely affecting the overall objective of the Working for Water project because if people do not understand the language used, then they cannot execute their work as they might also misinterpret the meaning. Most of the people in rural areas are the uneducated and the unemployed and that’s our target community as Department of Water Affairs (K4).



Further evidence from interviews showed that most community members in the different communities of practice cannot read and write in English. It is hard for most community members to translate the training materials into isiXhosa and when they attempt to do so sometimes the whole meaning is changed. As a result community members only use pictures in the resource materials such as manuals and handbooks for them to understand as they are all written in English (S2 & S3). This was evident in the following interview citation from S1:

For example the last time we had training in chainsaw, the person who conducted only used English as a language of facilitation. As a result many people in the training did not understand exactly what was happening. Luckily, this was a practical demonstration. If it was a theoretical training many people would not have understood a word. But because it was a practical one, people were just observing at what the trainer was doing and later try to do exactly what he had done. They only understood through observations.

To illustrate this further, a respondent during individual interviews from the Water for Food community of practice explained that:

As the Water for Food group, we have an assessment form for performance monitoring that each member should fill in information like, varieties and number of seedlings received, how many have germinated after planting and so on. But not many members use the form because they cannot read or write as it is written in English (S4).

Through observations, I noticed that most resource materials (manuals, assessment form) provided by Service Providers to members of the communities of practice after training workshops were all written in English (FO). For example, it was noticed that community members under the Working for Water community of practice were using a chainsaw training manual which was in English. Most of the workers were relying on other workers who could read to help them understand what was being said. Otherwise most of them were being helped by picture illustrations in the manual (FO). As most of the community members cannot read or write in English, this can have an effect on participation.

#### **4.5.2 Power relations**

Through document analysis, I discovered that there are power relations within groups in some communities of practice (L6) as well as between communities of practice and service providers. Power relations within communities of practice can influence social practices including participation and learning. Power-related issues needed to be taken into account in participatory structures and

processes, particularly gender bias, culture, race and other exclusionary practices (L6: 25). Underlying factors such as fear (of being outdone, losing jobs), pride, greed and jealousy affect participation and learning.

From the data collected during interviews, for example, under the Working for Water project, it was evident that novice learners within this community of practice seem to get discouraged while others withdraw from certain activities because the old timers become too harsh on them each time they ask to be helped. As indicated by the respondent:

There is this attitude that I have been observing for some time to workers that I pair to work with the slow learners and new workers. When it comes to doing activities, they always say there is a way in which we do them here. And so if a new worker reminds the old worker about something they think they have not done, they would say I have been here for some time, so what can you tell me. Some experienced community members are harsh to new learners during the apprenticeship process and this affects how they learn as some workers are afraid of asking further questions (S1).

This shows some element of boasting and unfriendliness to the novice learners. The old workers are hesitant to show the new workers all that is needed to do the work. This may be for fear that the novice learners would learn and become more knowledgeable than them and they would eventually take up their jobs.

Data from documents analysed also indicated that power relations between communities of practice and service providers can be embedded in the production of tools and learning resources for example and their assumptions about how things should be done and what people should know and learn.

Evidence from data through an individual interview also indicated that at times Service Providers provide training which does not address the specific needs of the community members. Some Service Providers come up with their own training specifications different from the ones requested by the intended beneficiaries of the training programme. It is apparent from this that the beneficiaries do not have power and freedom to make their own decisions. This is evidenced by data from an interview with a respondent who indicated that:

There is a problem because sometimes the Service Providers come up with what they know and not what the people want as beneficiaries of the training. Sometimes the training is not specific and does not address our needs. As a Manager I pass on my needs and that of the

workers to the Working for Water project Managers who then inform the Service Providers. Despite that they come up with their own training specifications (S1).

Through interviews data also showed that the power relations are affected by the way in which the structures for participation are developed, the way in which stakeholders are valued and access to resources needed to participate. A respondent expressed her concerns by explaining that:

The other is that if you want to deliver something to the people, it is important that you ask the intended beneficiary what their needs or requirements are. You can never deliver something to people without understanding if they need it or not. You therefore need to consult the people or beneficiaries of the services they need in order that what you are providing will be helpful and beneficial to them and their work (S1).

As a way to triangulate the findings, during an individual interview with the Department of Water Affairs, I tried to find out the value and make use of community knowledge on water resource management. The response was as follows:

Regarding community knowledge, so far what I have seen is the negative attitudes when it comes to water resource management. You get them polluting rivers, wasting water and there are no best practices. Even when you go to schools all you find are leaking taps, leaking toilets because demand for water conservation and management is not there. I cannot therefore attest to what you are saying that they have knowledge and value their water resources. Some of them do not know that some plants that they have within their areas are invasive alien plants like the guava and prickly pear. When I tell them, they even get shocked (K4).

It is evident from the above deliberations that the knowledge and value of the local communities is not considered, which also shows uneven power relations at play.

Through observations, I noticed in the two communities of practices (Working for Water project & Cata Agricultural Project) at their project sites, that workers were working in groups. Old and experienced workers were grouped with new workers. I also observed that the young men were grouped amongst men of their age group, while women were grouped with fellow women (FO).

#### **4.5.3 Low education levels**

Data through document analysis revealed that lack of education/ skills is a serious impediment to development. Although the percentage of people that had less education than Grade 7 has dropped from almost 50% in 2001 to 35% in 2007. Completing primary school is not necessarily a sufficient

educational achievement to enable one to perform effectively in the economy, but it is certainly a necessary achievement (L5). Because of the large number of mature adults with limited education, the emphasis is on adult education, through a variety of capacity building processes, including on-the job-training (ibid.)

Evidence from data obtained through interviews indicated that the low education level of most workers has a negative effect on participation, performance and expected output. The low education level has resulted in difficulties in changing the thinking of some of the workers (de-frame). They are stuck in their old ways of thinking and doing things. As indicated by a respondent during the interviews, some workers resist any change to help improve management of certain aspects and tend to brag like: "We have been here long enough and we know how we have been doing things and so no one can change the way things are done here" (S1). With these low education levels, it is hard to reframe their old ways, which is the key to social change processes.

Data also showed that due to the low education levels of most of the workers, learning is affected as most of them cannot understand much as the biggest component of the training programme involves listening. Most workers cannot read and write and this has a negative effect on the expected job outputs given to them (S1). Workers are being trained and re-trained but do not understand much due to low education levels (S2; S3). Low education levels inhibit full participation and learning, as shown in the following interview data:

Because most of the workers employed by the Cata Agriculture Project are of low education and this affects the expected output of the farm. Community members in Cata are not well educated. For example of the 26 workers employed, only 5 have attained grade 12 education. Even the Farm Manager has a grade 10 education qualification. The low education level impacts negatively on the farm performance as most workers cannot read or write. Therefore learning water resource management activities or advancing the workers skills is a big challenge. There is therefore need for more resources to employ qualified workforce (S3).

Another respondent indicated that: "Because people cannot read or write, it is very difficult to even implement a management plan. They cannot even measure their targets to see if they have achieved them" (K5).

#### 4.5.4 Policy Frameworks

##### 4.5.4.1 National Policy Framework for Public Participation

Data from individual interviews indicated that policy frameworks developed by the South African government have provided strategies and provisions for public participation in water governance issues. One such policy framework is the National Policy Framework for Public Participation of 2005 which promotes public participation in water resource management in their localised areas (K4). The document provides a framework for public participation in South Africa and builds on the commitment of the democratic government to deepen democracy, which is embedded in the Constitution as well as in the concept of local government, as comprising the municipality and the community.

##### 4.5.4.2 Betterment policy

Evidence from interviews showed that the policy on Betterment planning had an effect on people's socio-economic status which influenced their quality of life and involvement in community of practice. The people of Cata, who are isiXhosa speakers were resettled under the practice of Betterment planning by the old apartheid government. Under Betterment, designated areas were divided into distinct land use zones - for residential, arable and grazing usage - and all people were forced to move into the demarcated residential zones. The negative consequences of Betterment planning, according to respondents were social, political, economic and ecological. The suffering was huge and many people starved and ran away from the area due to misery. This was evident in the following interview citations:

When we arrived here, we were starving (*ukulamba*). We didn't have even a site or plot where to farm. The betterment movement was very bad because we were taken from the fertile soil and we lost our belongings and houses including cattle (*imvuyo*). Each family had five houses. When we arrived here because of the apartheid government, we were only given a small plot (site) that could not fit the whole family that was coming from the 5 houses which fitted the whole family. So now we have to find the site for the children to go out and build their houses because our house is too small. We have to survive in this kind of life which will never be the same as the previous one. We used to be happy then until they moved us (K1).

For example, when we came here we did not have plots for animals to graze from and there was nothing to graze. The cattle there used to have 9 calves because they had a big field to graze from. But here calves do not even reach 3. If they produce 3 calves you feel very happy. We cannot even keep goats because there is no place to keep them (K1).

We did not like the way they moved us. We lost a lot of our belongings in the process. We lost our houses, animals including our family members. They brought us here where there are thieves who can even kill me or rape my wife and daughters. We, especially the old people have a lot of problems. We have no jobs, people are not working and we have no farming implements as before. I do not farm anymore. Farming implements that we had were all taken during the moving process (K2).

Data obtained through observations showed signs of the effects of 'Betterment' which can still be experienced through the way the village settlements are organised. People are forced to keep their livestock (sheep, chickens, donkeys & horses) in the small residential plots that they occupy which are approximately 500m<sup>2</sup> in extent. They do not have even land for agriculture and are forced to cultivate in the small residential plots that they occupy while others do not even have spaces for gardening (FO).

#### **4.5.5 Poverty**

Data through documents analysed revealed that many community members participated in the various communities of practices in order to address the high poverty levels prevalent in the area. The socio-economic situation in Cata in 2000/1 was characterized by pervasive, worsening poverty. (L5). In early 2000, a household livelihood assessment by the Border Rural Committee classified Cata village into four groups: struggling, coping, moderate and well-off. 36% of households were struggling, which meant that they had no dependable source of income. This dire situation was confirmed by comparing the percentage of households with no income in 1996 with that in 2001. Over that five year period, the percentage of households with no income rose from 16% to 43% (ibid.). One of the reasons for the increase in poverty was that the amount of economic activities taking place in the area had declined (L4). For instance, in 1996, 58 people (i.e. 3% of the population) were employed and by 2001 only 44 people (i.e. 2% of the population) were in employment (L5).

This situation was confirmed during interviews and the focus group discussions when a respondent indicated that poverty was one of the reasons why people were participating in communities of practice. A respondent indicated that: "The reason I have chosen to work in this Water for Food project is because I was hungry" (FG1:2).

Poverty was also identified as one of the drivers for sustaining the farm operations in the area. A citation from an interview showed that: "The irrigation project is the source of food in this community to

contribute to the food security of the area and as a source of cheap protein for their families. Through this project many people get cheap vegetables which are very affordable and sometimes even free” (S2).

Further evidence showed that the high poverty situation in Cata was one of the main reasons why people were participating in these IWRM practices. Respondents in interviews said: “Community members are participating in the Water for Food community of practice so as to help improve the food security and address the issue of poverty in the Cata area, as you know there is poverty in Cata and there are not many jobs around” (S4).

The other thing is that the Working for Water project works towards poverty alleviation. It provides jobs and communities get paid and in a way it is creating jobs. The project is eradicating poverty in a way. As communities work, they earn money, buy food, clothes and other requirements that they need (K4).

## **4.6 REASONS FOR COMMUNITY PARTICIPATION IN IWRM PRACTICES**

Data obtained through document analysis, interviews, focus group discussions and observations revealed that community members are engaged in the different integrated water resources management practices for a number of reasons (L4; L5 & L7). Seven reasons were identified, and are discussed in more detail below.

### **4.6.1 Source of livelihood**

Through the documents analysed (L4; L5 & L7), data revealed that community members participated in the various communities of practices as a source of livelihood. Through participating in the different activities community members were earning an income in order to support themselves and their families. A quote from one of the documents analysed revealed that:

The irrigation development project is the source of food in this community; through this project most of the people can easily get vegetables in the community rather than having to rely on getting them from town. Also, vegetables from the irrigation development project are much more affordable (L5: 11).

This was evident from interviews and focus group discussions as shown in an interview citation from (S2): “The Irrigation project is the source of food in this community. Through this project many people get cheap vegetables which are very affordable and sometimes even free”. Further evidence from the focus group discussions indicated that people participated for example in the Water for Food group as a source of protein for their families and income to support livelihoods through the selling of the garden produce. This was confirmed by a respondent who said:

I started the project by myself in 2000 before this Water for Food project. I joined the group when I saw that the people in the group were doing the same things like me. And so I joined so we could work together. I planted my garden and I noticed that the garden was giving me a lot of food and money through selling to the community (FG3:1).

Another respondent explained that: “We raise money by selling. Last season we had a lot of cabbages and we sold them all. The project is really helping me in eating and we are getting money and food to support our families” (FG2:4). This was further confirmed by a respondent who indicated: “I sell the vegetables and they give me money. I also use the vegetable as food at home. Therefore, I keep planting, selling and eating my vegetables” (FG3:3).

#### **4.6.2 Skills development**

Data through document analysis revealed that some community members also participate in these water management platforms as sources for skills training and development (L2; L4 & L5). Through facilitated trainings and other learning interactions, people were developing and enhancing their skills. A quote from the Cata Story document indicated that:

Because of this development, people are trained in different skills which they use in the community; I see how these jobs are benefiting the people of Cata. We have acquired skills that we never thought possible; even women have been trained to work in construction. When we built the tanks for the Water for Food project, we made use of the skills we acquired through training provided. I was trained in fencing and now I am busy doing fencing for the irrigation scheme in the extended area (L5: 9).

An interviewee indicated that:

Because of the Cata Agricultural project, people are trained in different skills which they use in the community. As for myself although I only have grade 10 education qualification, I have



acquired skills through trainings provided by the Cata Agricultural Project and that has helped me to do the job as a Manager (S3).

Through working for Cata Agricultural Project and the trainings that I have acquired as clerk recorder, I have acquired skills in administration, management skills and many others. Just last month I got training in food and hygiene. Even if the project came to a close, I would survive because of the qualifications and experience I have acquired so far. It surely has changed my life (S2).

Another respondent indicated that: “The community also view the Working for Water as a skill development springboard to sustain their livelihood. People are participating as a Life skills development process” (S1).

Through observations, it was noticed that people have gained knowledge and skills through training, engagement with the practices and other learning interactions. These skills include gardening, rainwater harvesting, flood irrigation, river bank erosion control, identification and control of invasive alien plants. Other skills include improvement of soil fertility through use of organic materials, marketing and financial management, and environmental and water resources management (FO). The skills that community members acquire in the various communities of practices are life skills and can be useful in the future.

#### **4.6.3 Restoration of the productive potential of the land**

Data from documents analysed revealed that people are participating in communities of practice so as to restore the productive potential of the land through removal of the black wattle forests and other invasive alien plants that have invaded and replaced indigenous plant species (L4; L5 & CAM). Invasive alien plants can have large detrimental economic impacts on rural livelihoods as they affect the productive use of land (L4).

Evidence from a respondent through interviews showed that:

In Cata, invasive alien plants had generally dominated native species for space, nutrients, water and other necessities. This had resulted in significant transformation of habitats due to high levels of infestation and reduction in native species population. They had degraded the rich biological diversity of the area resulting in habitat modification and in certain cases destruction. Although these invasive alien plants were originally grown in commercial plantations for communal use they were creating enormous impacts in that they had spread to upper catchment areas of the rivers and other areas such as arable lands for agriculture and

animal grazing areas. These invasions had led to almost a complete extermination of local plant population (S1).

Further evidence from another respondent indicated that:

There had been loss of grazing land potential for livestock production in the area. This had resulted in low livestock production. It further caused soil erosion due to overgrazing by livestock as there was no adequate grazing land leading to sedimentation and siltation of the Cata dam (S2).

Information obtained through observations showed community members under the Working for Water project clearing the black wattle and other invasive alien plants from agriculture and grazing lands so as to restore the reproductive potential of the land (FO).

#### **4.6.4 Water availability and supply**

Data from documents analysed revealed that communities participate in IWRM practices in order to enhance water security in the area by increasing water supply and availability. The invasive alien plants invade spaces for indigenous plants and they also take up a lot of water (L2 & L4). Of great concern regarding these plants is not only the increasing rate at which they replace the indigenous vegetation but the stress that they pose on the environment due to their high water consumption levels (L4). For example, the Working for Water project aims at improving and securing water supplies through engaging local communities in the clearing of invasive alien plants which reduce the flow of water in streams and rivers. Here, as communities participate in the Working for Water community of practice, large tracts of invasive alien plants have been cleared. This has resulted in increased water flow in the Cata River, which had nearly dried up as a result of the black wattle and other invasive alien plant infestation (L4).

This was evident through interviews when respondents said that: "Most streams that are tributaries of Cata River which were infested with wattle had only pools of water in them which caused a lot of water shortages in the Cata River" (S1).

You know there is what we call invasive alien plants. These are foreign plants introduced into our areas and some have been declared invasive because of what they do. They invade spaces for indigenous plants and they also take up a lot of water... By virtue of them not being

controlled, they take up a lot of space and water because they have spreading roots and have become a big challenge. That is why they are being eliminated or controlled (K4).

From the Department of Water Affairs' side and in the long term, if you eradicate invasive alien plants, you are maximising chances of getting more water. So for these communities that are not getting water currently it means the first point of management are the catchment areas. That is where you get all the water flowing from. So if you eradicate invasive alien plants you are maximising the chances of getting more water (K4).

Information obtained through observations showed community members under the Working for Water project clearing the black wattle and other invasive alien plants along the water catchment areas (see Figure 4.1, Section 4.2.3) so as to increase water supply and availability (FO).

#### **4.6.5 Socio-ecological issues and risks**

Through document analysis, it was revealed that communities participated in these water related projects so as to address socio-ecological issues and risks caused by invasive alien plants. The thick wattle forests and other invasive alien plants were being used as cover by livestock thieves. Not only did these invasive alien plants create ecological issues, but social issues as well, such as incidences of women and children being attacked and raped as they collected firewood and drew water for their homestead gardens and domestic use (L4).

Data from interviews indicated that:

Due to the thick wattle forests and other invasive alien plants in the area, there used to be incidences of women and children being attacked and even raped as they collected firewood and drew water for their gardens and domestic use. The forests were also used as cover by livestock thieves. Such incidences used to be a common feature but now it is a thing of the past (S2).

Similarly another respondent stated that:

There was reported loss of potential uses from local plants for food and medicinal products or value, thatching grass, cultural and traditional values and other socio-economic benefits derived from them. Pressure from invading species was therefore threatening the diverse native plants with extinction. Invading acacia trees monopolised light and water resources so effectively that native species were almost completely crowded out with very little chance for survival (S3).

Information through observations showed at the Working for Water project site, community members were doing spacing in the wattle forest plantations by trimming branches using chainsaws. This was part of forest plantation management for the local community so that only the main branch grows up as these are meant for sale to timber loggers. The spacing is also meant to grow the wattle into a plantation and not a forest as a way to address the highlighted socio-ecological issues

#### **4.6.6 Incentives offered by the Cata Agricultural Project**

Data from documents analysed revealed that the Cata Agriculture Project provided incentives to members of the community of practice and other community members of Cata which foster community participation. Farm produce that has not met the market standards is given at very affordable prices and sometimes even freely to community members of Cata (L4 & L5). A quote from one of the documents analysed showed that:

The irrigation development project is the source of food in this community; through this project most of the people can easily get vegetables in the community rather than having to rely on getting them from town. Also, vegetables from the irrigation development project are much more affordable (L5: 11).

Evidence through interviews also showed that community members that have livestock are also allowed to graze their animals in unplanted fields. The farm is therefore an opportunity for livestock farmers as it provides additional grazing areas for their animals especially during the winter season when forage is the biggest problem in the area (S2). “Through the irrigation project in Cata we are able to produce fresh produce at a reasonable price and this help minimizing travelling costs and ensures that most of us have food” (S3).

It was evident through observations that the Cata Agricultural Project provides incentives to members of the Cata community (FO). This was captured through photographs where livestock belonging to community members is allowed to graze in the unplanted fields of the farm as seen in Figure 4.12.



**Figure 4.12:** Community livestock grazing in unplanted fields of the Cata Agricultural Project Farm

## 4.7 CONCLUSION

The chapter has dealt with raw data from interviews, focus group discussions, documents reviewed and my own observations during the study. The chapter has dwelt on themes that were illuminated during analysis such as structures for community participation and learning, learning interactions, knowledge acquired and reasons for community participation in IWRM practices. From these findings, some significant themes emerged that formed the basis of the discussions in Chapter 5.

## **CHAPTER 5**

### **DISCUSSING THE FINDINGS**

#### **5.1 INTRODUCTION**

This chapter describes significant themes that are based on the data presented in Chapter 4. Chapter 4 provided a thick description of the data (Bassey, 1999) which was based on themes that emerged from the analysed data and which were informed by the research question and goals. In this chapter, analytical statements are presented which draw on the theoretical and contextual discussions presented in Chapter 2 using abductive and retroductive modes of inference. In doing this, I address the research question (see Chapter 1), which aims to develop an understanding of community learning in IWRM practices. As outlined in Chapter 1, the following goals guided the research:

- To understand and describe how learning takes place as communities participate in selected IWRM practices (see Section 4.3);
- To understand community questions and what knowledge resources are available to mediate these questions (see Section 4.4); and
- To understand how water management structures and underlying mechanisms influence learning processes and opportunities with specific reference to IWRM practices (this chapter).

#### **5.2 COMMUNITY LEARNING IN INTEGRATED WATER RESOURCE MANAGEMENT**

The findings in Chapter 4 (Section 4.3) indicated that people are learning through both informal and formal processes by engaging in social learning interactions with other community members as well as with outsiders in their daily water management and food production practices. The interactions people make and the understandings they develop are dependent upon and influenced by what is experienced within their communities of practice. Data also showed that learning is influenced by a number of contextual factors (see Section 4.5). As mentioned in Chapter 2, Lotz-Sisitka and Burt (2006), indicated that understanding or establishing “best practice” in IWRM would require careful contextual analyses, involving an understanding of the interplay of a range of different contextual factors that influence, and shape participation possibilities and opportunities. In this study, this required critical realist causal analysis identifies mechanisms and structures influencing learning. Discussed below through analytical

statements, are insights that have been gained through undertaking this study which addresses the research question and goals.

### **5.2.1 Analytical Statement 1:** Participating in a community of practice creates a platform for learning

As shown in Chapter 4 (Section 4.3), people are learning everyday through engaging with other community members in their daily social practices. Learning occurs through meetings (both formal & informal), social interactions and conversations within villages. Such interactions are very useful as they provide a platform and an opportunity for the group members to come together and discuss issues affecting them and also to share information, knowledge and learn from one another as a community of practice.

Fuller (2007) (see Section 2.6.1) contends that the concept of community of practice invites a focus on learning as a collective, relational and a social process. This argument is supported by Lotz-Sisitka (2011) who notes that people learn through their co-participation in the shared practices of the community or the lived-in world. It is the process of interaction with others that produces and establishes meaning systems amongst learners. Therefore, participating in communities of practice give rise to the opportunity for people to become knowledgeable practitioners through their co-participation but this outcome is not inevitable (see Section 4.4). Communities of practice can create conditions which inhibit, or give rise to alternative learning outcomes (Lave & Wenger, 1991) (Section 2.6.1).

Smith (2003) proposes that community creates the environment for the social interaction needed to engage in dialogue with others to experience the various and diverse perspectives on any issue. He says community is the joining of practice with analysis and reflection to share the tacit understandings and to create shared knowledge from the experiences among participants in a learning opportunity (ibid.). As discussed in Chapter 2, Stein (1998) identifies practitioner knowledge and cultural knowledge as significant in communities in which a new member must learn to perceive, interpret, and communicate experience through interactions with other members of that community. He argues that community provides the opportunity for interaction; and participation provides the learner with the meaning of the experience (see Section 2.6.1).

In Section 4.3.5, I reported that people learn through observations and trying things out and experimenting with new ideas. Observing trained colleagues working in their gardens allowed other

members to copy ideas and practices and implement them at their homesteads. For example, members of the Water for Food group that received formal training organized a practical demonstration for members that did not have an opportunity to do so. Through such interactions other members were trained and replicated what they had learnt at their homesteads and through this process learning has continued to develop among group members through observations and then replicating the practice. Ibarra (1999) (see Section 2.6.2) has shown how individuals develop practices by observing others, imitating them, and then adapting and developing their own particular practices in ways which match not only the wider community norms, but their own individual sense of integrity and self. This idea is supported by Brown and Duguid (2001) who note that it is through participating in communities that individuals develop and possibly adapt and thereby reconstruct their practice (see Section 2.6.2). It is through participating in communities of practices such as Water for Food that individuals develop and possibly adapt the practice.

Data presented in Section 4.3.6 showed that novice and slow learners were paired or grouped together with old and experienced learners so that they could learn from them and develop competences. Lave and Wenger (1991) (see Section 2.6.3), argue that learners inevitably participate in communities of practitioners and the mastery of knowledge and skill requires newcomers to move towards full participation in the socio-cultural practices of a community through a process of legitimate peripheral participation. Lotz-Sisitka (2011) supports this and says a process of legitimate peripheral participation is used to explain that when we start learning something new, we are always on the edge and that as we learn, we gain more experience, develop our identities and gain membership of different kinds of knowledge communities (see Section 2.6.3). Downsborough (2007) contends that Vygotsky noted that through the social interaction with a supportive adult or peers, learners are able to move beyond their current range of ability and function at a higher level. In communities of practice there are more experienced people, and others with less experience, and through the exchange of experience, those with less experience learn from those with more experience, and grow in confidence and competence over time (Handley et al., 2006) see Section 2.6.3. However, as shown in Chapter 4, this is not without problems as elders or more experienced practitioners do not always want to share their knowledge.

In Chapter 2 (see Section 2.6.2), drawing on Handley et al., (2006), I described learning as an integral and inseparable aspect of social practice which involves the construction of identity through the changing forms of participation in communities of practice. The core processes of participation, identity-



construction and practice occur within communities of practice (Handley et al., 2006). Learning is a process of participation in communities of practice (Lave & Wenger, 1991), as also shown in this study.

**5.2.2 Analytical Statement 2:** Local structures for community participation and learning have developed around a practice

As shown in Chapter 4 (see Section 4.2) the structures for community participation in IWRM in Cata are the local structures that have been developed around an integrated water resource management practice (where WRM is integrated into the context of local practices). Through participating in these structures people understand and learn to engage with tools and develop practices. Evidence from the findings also revealed that although a platform for community participation, the Water User Association was launched for the area in 2010, there are no other structures for community participation at community level that exist as proposed for in the South African National Water Act of 1998. The Water User Association is limited to registered water users who use water other than for domestic purposes. Literature in Chapter 2 (see Section 2.4) indicated that the National Water Association makes provision for a number of stakeholder platforms (Water User Association & Catchment Management Forums) where IWRM can be negotiated at the level of a Water Management Area. The purpose of establishing these agencies is to devolve water resources management to the regional or catchment level and to involve local communities.

Burt et al. (2006) see Section 2.4 contend that although South Africa has embarked on a formalised model for participatory water resource management practice, evidence on the ground shows that many aspects of natural resource management, including water allocation and usage, are regulated by traditional institutions and structures, which have not been formally considered in the newly-proposed structures. In reality, indigenous and traditional management approaches represent a considerable contribution to regulating access to water resources. Supporting this argument, Lotz-Sisitka and Burt (2006), propose that in the South African context, it would seem important for the DWA to develop strategies for working within local cultures and existing practices where relevant, and include taking account of, and valuing local knowledge (see Section 2.4.2). Brown (2011) supports this and argues that it would be more valuable to engage communities in participatory projects such as the Water for Food project, which strengthen their abilities to maximise the benefits of existing local water management rainwater harvesting practices, instead of participating in structures that would appear to be ineffective in addressing community needs. For example, through participating in the Water for Food

project, community members have had their skills in rainwater harvesting, nutrition and food production methods, methods of water treatment and recycling of household water, soil conservation practices and marketing and business management enhanced through the various learning and social interactions. Through social learning interactions community members engaged in the Working for Water and Cata Agricultural projects have also had their knowledge and skills enhanced in areas such as forestry management, river water harvesting, invasive alien plant identification and control, catchment management, environmental management, and small, micro and medium enterprise development (SMME) among others. Catchment Management Areas will need to accommodate, respect and even promote local informal water management institutions such as the three communities of practice (Water for Food Project, Working for Water Project & the Cata Agricultural Project – see Section 4.2). Strategies need to be developed to allow statutory and local customary institutions to work together as it has been found that working towards development and strengthening people's ability to work within these structures was needed if they are relevant to their intended objectives (Burt et al., 2006). The integration of communal ways of managing water and the formally legislated system is particularly important in South Africa where both institutions are powerfully present as shown in the case of Cata where community members are participating in IWRM including regulating the use of water resources (Lotz-Sisitka & Burt, 2006), (see Sections 2.4 & 4.2).

Burt and Berold (2011) also observed that learning and learning resources are more effective when they engage learners with water issues as they experienced them in their local context. This was also evident in the two Dutch case studies, where researchers observed that knowledge creation must emerge out of the practices of stakeholders situated in their specific contexts (Jiggins et al., 2007). They observed that “deliberately organised shared reflection” among stakeholders at different levels is important as this potentially leads to “an explicit awareness of the processes that are taking place, and hence of deeper capacity to design and manage such processes” (Jiggins et al., 2007: 533), and it is these shared reflection spaces that mediate learning and understanding. In the case of Cata it is these water management practices that create spaces for reflection and understanding so as bring to peoples' awareness the learning processes that are taking place within these practices. With a deeper understanding of their practices and the factors that effect and mediate them, individuals will hopefully have a deeper capacity to understand and work with the challenges posed by sustainable water management (Burt & Berold, 2011). This study showed that it was in and through the practices of food production, alien vegetation management and formal agriculture that water management knowledge was ‘useful’ and as such it was mediated through these practices.

### **5.2.3 Analytical Statement 3:** There are a diverse range of contextual factors and structural mechanisms that influence participation and learning in communities of practice

Reflecting on the findings in Chapter 4, it was evident that a diverse range of contextual factors and structural mechanisms influence participation and learning in communities of practice (see Section 4.5). These include history, knowledge, power relations, resources, conflicts, language, education levels and attitudes among others and different causal relationships exist amongst these as described by Sayer (2000). Masara's (2010) research study revealed that learning is internally and externally influenced by socio-cultural, political and economic complexities. Supporting this view, Pesanayi (2008) found that a number of underlying structures and causal mechanisms (power relations, drought, cultural history, capacity and knowledge) were found to influence learning interactions and choices in rural farming communities of practice in Zimbabwe. This research shows that these sometimes influence the changing of domain and practice (see Section 2.7). Described below are some of the causal factors influencing participation and learning in Cata.

- **Language**

Findings in Chapter 4 (Section 4.5.1) show that the use of *English language* during facilitated training programmes does not always work, as not everyone understands what is being said. Use of English as mode of facilitation hampers participation as most workers cannot read and write in English and this inhibits understanding and is a barrier to participation. As noted in Chapter 2 (Section 2.6.1), Lave (1988) explains that from a situated cognitive perspective learning occurs in a social setting through dialogue with others in the community. Lave and Wenger (1991) argue that there is no learning without participation. They describe participation as the interchange of ideas, attempts at problem solving, and active engagement of learners with each other and with the materials of instruction. Learning becomes a process of reflecting, interpreting, and negotiating meaning (using language) among the participants of a community (ibid.) (see Sections 2.6 & 2.6.1).

Reflecting on Section 2.4.2, Danermark, Ekstrom, Jakobsen and Karlson (2002) argue that human language is a distinct feature in human societies, and it has a very important role for conveying and exchanging meaning in the social world. At the same time language as such has specific qualities and ways of functioning, with far reaching implications. Lotz-Sisitka and Burt (2006) support this and

maintain that the ability to communicate effectively directly affects the way in which people are able to make decisions and act. This is demonstrated by examples of a study where some stakeholders were excluded from the Catchment Management Area establishment process because of their inability to speak in English. In the case of Cata, this was evident as reported in Section 4.5.1, where use of the English language in facilitated training affected participation and work performance of many community members under the Working for Water project as they cannot understand much since they cannot read and write in English. Similarly, this was also evident in the Water for Food community of practice where it was stated that members cannot use the monitoring form to assess their performances because of their inability to read or write in English since the form is in English (see Section 4.5.4). Lupele (2003) working on materials development in rural Zambia noted that language plays an active role in knowledge construction. He proposes that in order to enable participants to generate information based on their experiences, it is important that they use the language they are familiar and comfortable with (see Section 2.4.2).

- **Power relations and conflict**

Evidence presented in Chapter 4 (Section 4.5.2) shows that there are *power relations* within and between groups in some communities of practice. It was noted that novice learners seem to get discouraged while others withdraw from certain activities because the old timers become too harsh on them each time they ask to be helped. Power relations can influence social practices including participation and learning. In Chapter 2 (see Section 2.4.2), I discussed power relations in communities of practice as a causal power. In this study and from a critical realist perspective, causal powers are contextual factors that influence how participation and learning can take place in communities of practice (Pesanyai, 2008). Lotz-Sisitka and Burt (2006), in Section 2.4.2 contend that while participatory practice is often established with a view to reducing power gradients and enabling more equitable forms of natural resource management, participation does not always lead to a balance of power. The authors say participation can actually entrench existing power relationships because of a lack of clarity or ambiguity as to the meaning and role of participation in water resource management. This is demonstrated by examples in Section 4.5.2, where the old and experienced workers under the Working for Water project were reported to be hesitant to show the new workers all that was needed to do the work, possibly for fear that the novice learners would learn and become more knowledgeable than them and they would eventually take up their jobs. Further evidence also showed that at times Service Providers provide training which does not address the specific needs of the Working for Water project

by coming up with their own training specifications different from the ones requested, showing that the beneficiaries do not have power and freedom to make their own decisions. Power relations, sometimes referred to as 'power gradients', often hamper equitable and fair participatory practices (Burt et al., 2006). The different meanings ascribed to participation affect the focus of participation and thus the power relations between people and organisations.

Issues related to power inequalities must be taken into account; otherwise the negotiation process itself may make them worse. Daniels (2008:98 quoting Hodkinson, 2004) in Section 2.6.4.2 notes that, whilst Lave and Wenger (1991) are clear that there are significant issues of power and conflict in the process of becoming a full member of a community of practice, in that tensions arise between newcomers and full participants:

Unequal relations of power must be included more systematically in our analysis...It would be useful to understand better how these relations generate characteristically interstitial communities of practice and truncate possibilities for identities of mastery...

Any given attempt to analyse a form of learning through legitimate peripheral participation must involve analysis of the political and social organisation of that form, its historical development, and the effects of both of these on sustained possibilities for learning...

Thus participation in the cultural practice in which any knowledge exists is an epistemological principle of learning. The social structure of this practice, its power relations, and its conditions of legitimacy define possibilities for learning.

What this means for the three selected communities of practices (see Section 1.5.4) in Cata community is that in order to empower local communities with the necessary knowledge and tools to take care of their own welfare through IWRM learning processes, there is need to understand learning processes and the diverse range of contextual factors and structural mechanisms and events that influence participation and learning opportunities. As argued by Daniels (2008), it is vital to consider the relations of power and control embedded in the production of cultural or mediation tools and their use in learning processes because the forces that go into their production often play a major role in determining how it will be used.

Reflecting on the deliberation by Wals (2007: 40), in Section 2.4.1 he also notes that:

... in social learning the conflicts and their underlying sources need to be explicated rather than concealed. There is no learning without dissonance, and there is no learning with too much

dissonance. ...An important role of facilitators of social learning is to create space for alternative views that lead to the various levels of dissonance needed to trigger learning both at the individual and the collective level.

Conflicts in a participation process can also function to highlight issues that are important to marginal groups, which might not otherwise be recognised (ibid.). For Cata, due to the composition of people in the communities of practice with divergent views, different backgrounds, experiences and expectations, conflicts may arise as a result of these differences. Such contextual factors and structural mechanisms must be taken into account for furthering learning and participation in community-based IWRM practices.

- **Low education levels**

Findings from Chapter 4 (see Section 4.5.3) show that the *low education levels* of most workers in Cata have a negative effect on participation and learning. Most of the community members cannot read and write and so cannot understand much since the biggest component of the training programmes is listening and writing. As discussed in Chapter 2, Section 2.4.2, Pesanayi (2009: 66) argues that learning in communities of practice is influenced by structures that may both support the process and result in a positive change, or can also constrain the agency of people learning in a community of practice. Due to the low education levels of most members of communities of practices, participation and learning can be negatively affected. As a result, this may affect the implementation. This was demonstrated in this study where because of most of the low education levels of the workers employed by the Cata Agriculture Project, it affected the expected output of the farm. The low education level has impacted negatively on the farm performance due to the inability of most workers to read and write. Learning IWRM activities or advancing the workers skills is a big challenge (see Section 4.5.3).

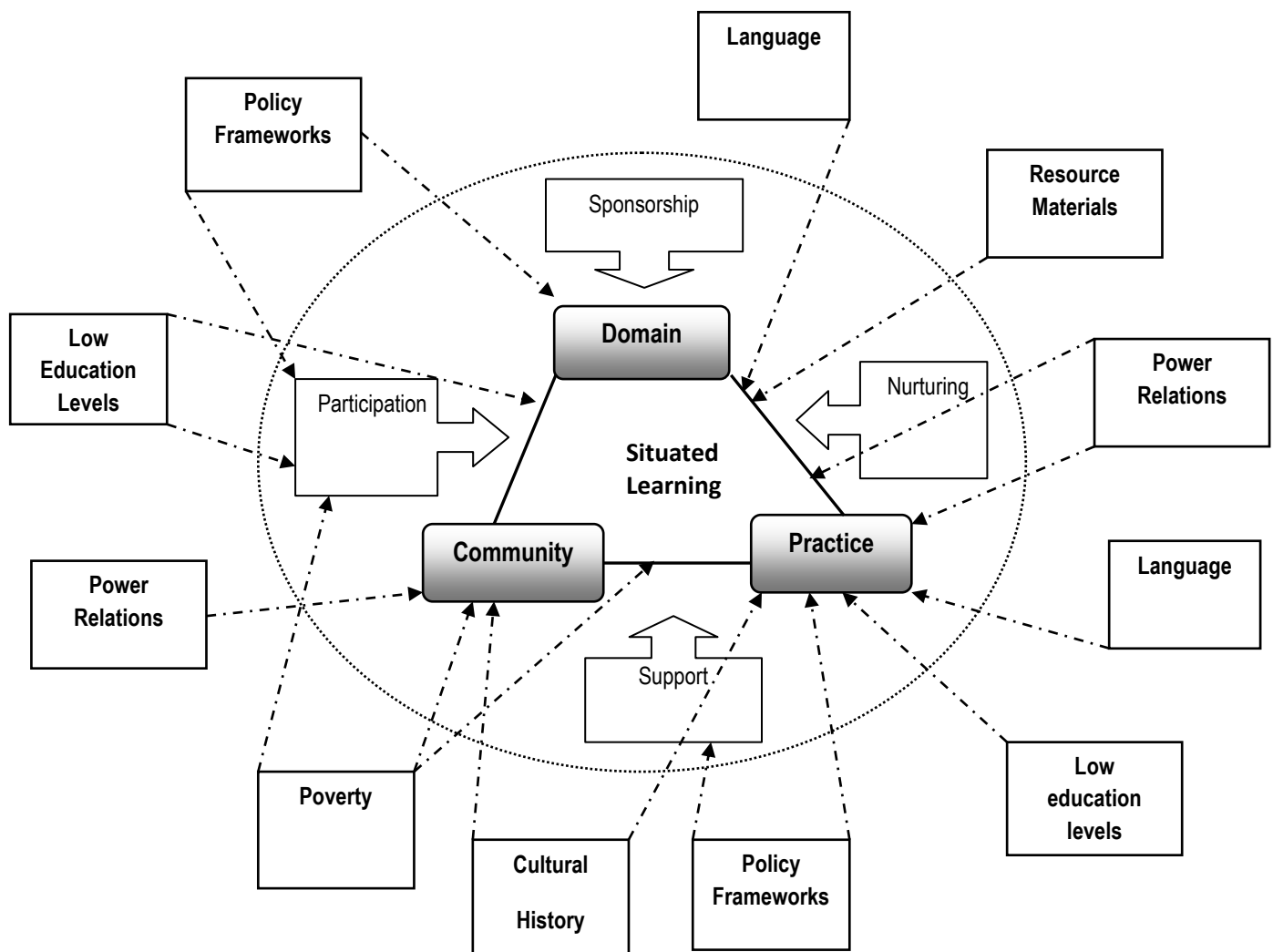
Clapper (1996) supports this account and maintains that education level is one of the most powerful factors in stimulating full participation. Higher education levels with a concomitant increase in skills, foster higher levels of participation. He contends people who have attained higher levels of education are more likely to participate because they are more aware of the impact of government on the individual, have more political information, and consider themselves capable of influencing government activities. They have more opinions regarding political subjects, are liable to discuss politics more and with a wider range of people, and are more likely to be active members of a community and other organisations (Clapper, 1996). Although in Cata, the percentage of people that had less education than

Grade 7 has dropped from almost 50% in 2001 to 35% in 2007, completing primary school is not necessarily a sufficient educational achievement to enable one to perform effectively in the economy (see Section 4.5.3). The lack of education/skills for most community members in the three communities of practice is a serious impediment to learning IWRM practices and community development.

This is acknowledged by Lotz-Sisitka and Burt (2006) who argue that people will not participate unless they have an understanding of what they are participating in and why they are doing so. Herrfahrat-Pahle (2010) further supports this and argues that the key to the development of capacities of stakeholders especially that of local communities is to enable them acquire appropriate knowledge and skills which will enable them to participate effectively in IWRM if sustainable development is to be attained (see Section 2.4.1). Capacity-building in communities is an important objective, but needs to be preceded by mobilisation of community capacity that already exists (through good education levels) but becomes evident only when communities are empowered (through structures and processes that will enhance participation, knowledge and skills). There is a need to look into the relationship between participatory practices and capacity development in order to strengthen the practice (Haddad et al., 2007) (see Section 2.4.1).

- **Interacting Causal Factors**

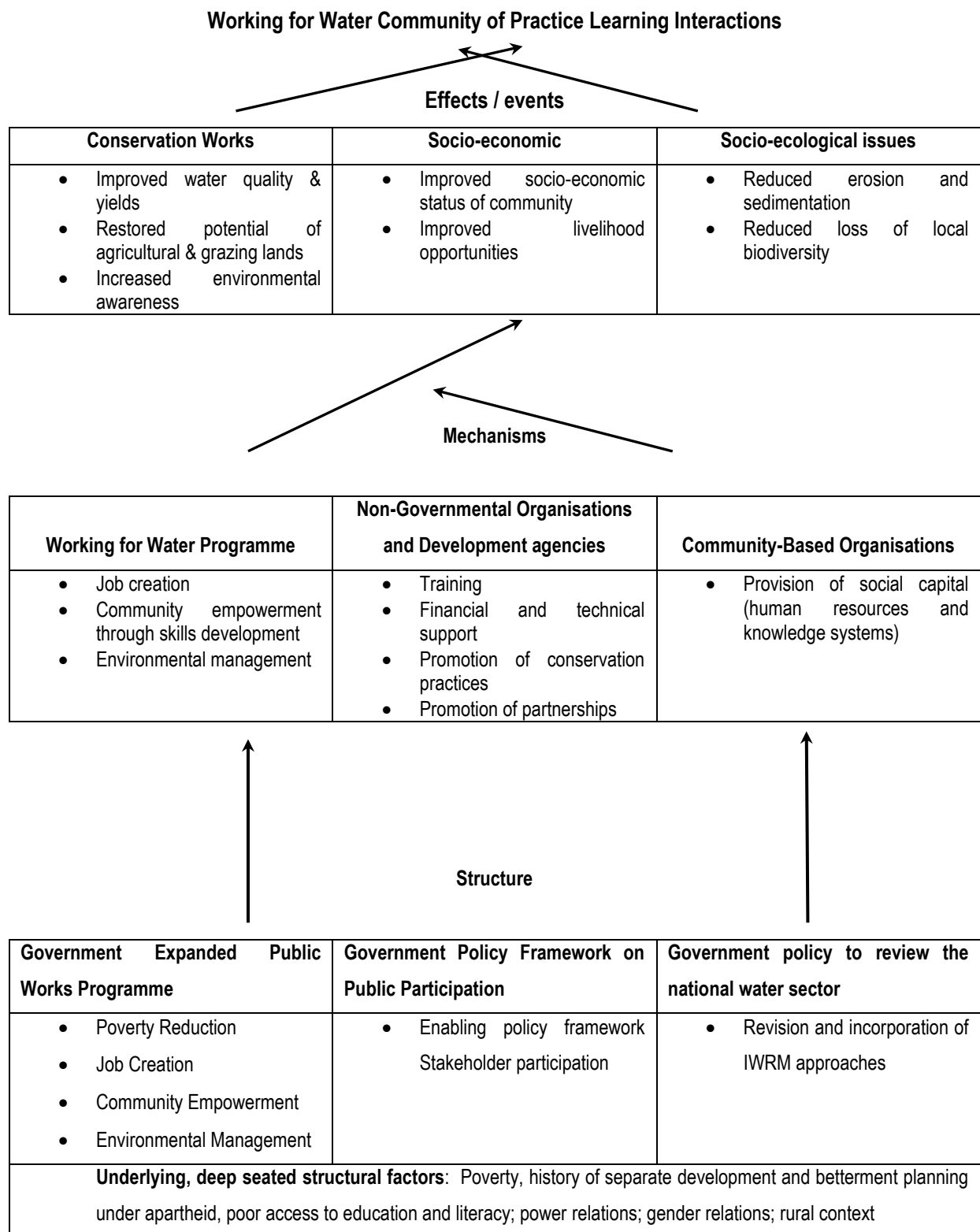
Understanding and establishing 'best practice' in IWRM would require *careful contextual analyses*, involving an understanding of relationships between a range of different contextual factors that influence and shape participation opportunities and possibilities (Lotz-Sisitka & Burt, 2006) (see Figure 5.1). Reflecting on Hammond et al.'s (2001) deliberations, the social context created within the social interactions, the ways in which communication, and opportunities for collaboration are structured, all influence the learner's understanding and construction of knowledge (see Section 2.4.3).



**Figure 5.1:** Underlying structures and causal mechanisms influencing learning interactions in communities of practice in Cata (using diagram structure of Pesanayi, 2008)

A critical realist causal analysis was conducted to unravel the various causal factors influencing learning opportunities and possibilities in the three selected communities of practice. These are shown in open system maps in Appendix XII, one of which is shared here by way of example (see Figure 5.2 below). It shows how underlying structures and mechanisms shape and influence the learning that takes place or can take place in the communities of practice.





**Figure 5.2.** An open system with underlying structural mechanisms influencing learning interactions

**5.2.4 Analytical statement 4:** Although learning has been shaped by external influence, a sizable amount of learning was achieved through social interactions amongst communities of practitioners and the practice

Drawing on the findings in Chapter 4 (Section 4.3), evidence showed that learning in communities of practice is shaped by external influences which include long term historically constituted factors such as power relations, gender relations, poverty etc (at the level of the real, as shown in Figure 6.2), but also that learning in these communities of practice has been shaped through external influences (at the level of events) such as training programmes, interactions with experts and extension support services. However, as much as this has contributed to the learning outcome, observations and interviews showed that, at the level of the empirical, people are learning everyday through social interactions and social practices with other community members. Learning occurs through meetings, social interactions, observations and conversations within villages (see Sections 4.3.2; 4.3.3; 4.3.4; 4.3.5; 4.3.6; & 4.3.9). The Water for Food group for example, conducts both formal and informal meetings to share information, knowledge and the opportunity to learn from one another. Such meetings are very useful as they provide a platform for interactions and an opportunity for the members to come together, discuss issues affecting them and learn as a community of practice. During these interactions members share best practices, experiences and discuss problems and provide possible solutions for each other.

Downsborough (2009) (see Section 2.6) contends that the importance of social interaction and participation in activities is seen as an integral part of learning. Through their interactions and relationships in the three communities of practice observed in this study, people have developed into a knowledge community, whereby knowledge of water resource management lies with them as a resource (shared repertoire), which they are able to communicate and share with other people. Interaction with and reaction to the environment plays a crucial part in everyday learning. People learn from their experiences in the world by experimenting, reading, experiencing field trips, thinking and reflecting, engaging in conversations and making connections between experiences (ibid.). Lotz-Sisitka (see Section 2.6) supports this view and maintains learning includes active reflection on experiences to integrate them with the existing stock of knowledge in society, drawing conclusions or generalizations from patterns, and generating predictions and expectations (Lotz-Sisitka, 2011). In other words, we learn a lot by doing, such as by interacting with each other in the doing. Learning is viewed as an aspect of all activity, as an integral part of the social practice.

Chapter 4 also shows that people in the various communities of practice in this study, learnt through a practice, in this context water resource management such as rainwater harvesting and invasive alien plant removal which was integral to other practices (for example, food production) (see Section 4.4). For example the Cata Agriculture Project conducts bi-weekly meetings with workers where information and lessons are shared amongst workers and management. In another instance, the contractor for the Working for Water project indicated that she briefs the workers regularly before starting as a way for workers to learn (see Sections 4.3.3; 4.3.5; 4.3.6; & 4.3.9). By participating in a community of practitioners people understand and engage with tools and are developing practices in relation to their communities of practice.

It is through communities of practice that learners interpret, reflect, and form meaning (see Section 2.6.1). Community creates the environment for the social interaction needed to engage in dialogue with others to experience the various and diverse perspectives on any issue (Lave & Wenger, 1991). The authors argue that community is the joining of practice with analysis and reflection to share the tacit understandings and to create shared knowledge from the experiences among participants in a learning opportunity. Stein (1998) further identifies practitioner knowledge and cultural knowledge as significant in communities in which a new member must learn to perceive, interpret, and communicate experience through interactions with other members of that community. Community provides the opportunity for interaction; and participation provides the learner with the meaning of the experience (see Section 2.6.1). In Chapter 4 (see Sections 4.2 & 4.4), as communities are participating in the three communities of practice, the enabling structures for participation and learning, they are engaging in IWRM practices with other community members, in understanding the meaning of the practice and learning how to it, developing cultures of practice that are seen to be useful in the context.

This idea of learning through a practice is discussed by Daniels (2008: 99 citing Brown et al., 1999; see Section 2.6.1), who argues that "knowing and doing are reciprocal – knowledge is situated and progressively developed through activity and that one should abandon the notion that concepts are *self-containing entities*, instead conceiving them as *tools*, which can fully be understood through use. Learning is understood as a process which is often tacit and takes place through shared or joint action and has a generative effect on the pattern of activities in which it occurs". This was evident in the study, as reported in Section 4.3.5 where members of the Water for Food group who did not attend training programmes learnt how rainwater is harvested (Figure 4.7, Section 4.4), how to control erosion and

pests such as *ntuku* (mole), how to prepare trench beds for vegetables (Figure 4.4 above, Section 4.3.4), and how to improve the soil fertility of their gardens through the practical demonstrations and observations they experienced at other members homesteads. Further evidence is reported in Section 4.3.6 where the Cata Agriculture Project uses the apprenticeship system whereby new workers are attached to old and experienced workers to promote learning by the new workers undertaking the activities on their own. In this process, the new members are learning and mastering the skill. As Smith (2003) argues, there is no learning without participation, and learning becomes a social process dependent upon transactions with others placed within a context that resembles as closely as possible the practice environment. Knowledge is created through the interactions of the learner with others and the environment.

### **5.2.5 Analytical Statement 5: Learning takes place through facilitated interventions**

The findings in Chapter 4 (see Section 4.3.1) showed that community members in the three selected community of practices are learning from facilitated training programmes. Learning occurs through training workshops facilitated by the Working for Water project, the Border Rural Committee, Cata Communal Property Association, Department of Water Affairs, Department of Agriculture and other rural development Non-Governmental Organisations.

In Section 2.4.5, Sfard (1997) contends that there are two metaphors of learning that guide our work as learners, teachers and researchers, the acquisition and participation metaphors. The acquisition metaphor involves reception, acquisition, construction, internalisation, appropriation, transmission, attainment, development and accumulation. This may be through the teacher helping the learner attain his or her goal by delivering, conveying, facilitating, mediating, and so forth.

In Cata, people are acquiring both formal (expert knowledge) and informal knowledge through social interactions. Social interactions can either take place through informal and/or formal processes such as meetings, training workshops, conversations and interactions with outsiders. Through these interactions, people build relationships with each other and develop into knowledge communities (Lotz-Sisitka, 2011)

The findings reported in Chapter 4 (see Section 4.3.1) revealed that, for example, most of Water for Food group members of Cata underwent a training programme at Matsepo in Pretoria. Information learnt included rainwater harvesting, improvement of soil fertility, erosion control and garden management. Further evidence from participants during individual interviews also showed that learning takes place through training workshops provided by Consultants/Service Providers. For example, workers under the Working for Water project were provided with training in the practical use of a chainsaw, herbicide application, first aid and others depending on what had been prepared by the Service Providers. Similar training interventions were also reported for the Cata Agricultural Project, where both new and old workers were trained in their respective jobs such as pest identification and control, furrow making, flood irrigation and soil conservation practices by consultants with support from the National Development Agency.

Masara (2010) (see Section 2.7) found that social learning in particular, through intervention workshops is supported by the different knowledge bases of participants. He argues that in such learning processes distributed knowledge – divergent nature culture views on the use of ecologically sensitive areas – existed and interacted in a learning process oriented towards understanding learning and sustainable development issues in the context of commercial beekeeping taking place in a complex social-ecological context. He said such knowledge bases were the source of information for learning and constructing model solutions (ibid: 17). In Cata, through these facilitated learning interventions, members of communities of practice come together to share experiences, best practices, lessons and challenges they encounter.

In Section 2.7, Burt and Berold (2011) also found that knowledge construction and learning are always mediated. They revealed that mediation was one of the main themes to emerge. In this context a mediator is understood as an *individual* who “re-interpret[s] knowledge in a way that is relevant to a particular water practice and to those involved” (ibid: 4). Through discussion groups many participants felt that “the best learning is direct human-to-human interaction” (Burt & Berold, 2011: 10). The mediation of knowledge, however, occurs on many different levels other than just through an individual. Knowledge is mediated in implicit (invisible) and explicit (visible/clearly defined) ways within the context of community-based water research management.

Explicit mediation refers to mediation that mediates a specific category of reasoning (Daniels, 2008). An example of explicit mediation within water knowledge is the use of reports, learning resources and

actual individuals who re-interpret knowledge in a specific way and aim to teach or inform through a particular category of reasoning as was seen through the training materials used by the Working for Water programme in the Cata district for example.

## **CHAPTER 6**

### **RECOMMENDATIONS AND CONCLUSION**

#### **6.1 INTRODUCTION**

Chapter 6 presents a summary of the main findings of the research with reference to the research context and research question. The chapter provides recommendations based on the analytical statements on community learning in IWRM practices as presented in Chapter 5. The chapter also provides recommendations and opportunities for further research and a conclusion of the whole study.

#### **6.2 SUMMARY OF THE STUDY**

As the research was focussing on developing a deeper understanding of community learning and processes in IWRM practices, I had to draw on communities of practice and critical realism as tools in understanding social learning interactions and processes. I utilised literature from government (water policy, water legislation and public participation policy framework), Non-Governmental Organisations, academic research and publications. I undertook key informant interviews with nine individuals from the Cata community, local municipality and government departments. All interviews except one with Amatole District Municipality were audio-recorded.

Three focus group discussions were conducted in the two communities of Cata village. The focus group discussions targeted women groups involved in the Water for Food for homestead gardens and the discussions were audio recorded. All communication during the discussions was done in *isiXhosa* by a local interpreter who also took down the participants' responses. For these groups, discussions were conducted by first seeking permission to record the deliberations using an audio recorder and employing the services of an interpreter from English to *isiXhosa* and vice versa, which were accepted and thus this allowed me to follow the discussions as I could not speak *isiXhosa*.

Ethical concerns were at the forefront of my research study and continued throughout all the stages. All participants were briefed about the purpose of the research and their rights as participants in research before data generation. I sought the participants consent to be interviewed and quoted and access to

community members, government and other institutions was negotiated with relevant authorities. All personal data was secured and only made public behind the shield of anonymity. Overall, the study provided me with deeper understandings of social learning interactions and processes in communities of practice.

### 6.3 KEY FINDINGS

In Chapter 5, the discussions centred on the analytical statements. These were found to be the key themes that emerged from the data that was analysed and presented in Chapter 4, and they are presented in this chapter as key findings of the research study.

#### *1. Participation in communities of practice creates a platform for learning for community members*

There is evidence that people are learning through engaging with other community members in their daily social practices. Learning is taking place through meetings, social interactions and conversations. Such social interactions are providing a platform for learning as communities come together to share knowledge, experiences, best practices and discuss issues affecting them in their communities of practice. The community of practice provides the opportunity for interaction whilst participation provides the learner with the meaning of the experience and practice (Lave & Wenger, 1991).

#### *2. Participatory structures for local communities have developed around a WRM practice*

The local communities of Cata are participating and learning to engage with tools and develop practices. This is being done through participatory structures at community level that have evolved around WRM practices such as rainwater harvesting, which in turn is linked to other practices such as food production.

#### *3. A diverse range of contextual factors and structural mechanisms influence participation and learning in communities of practice*

In order to understand and develop best practices in IWRM, it would require careful consideration and analysis of causal factors which are contextual, that influence participation and learning in communities



of practice. These include issues such as power relations, language, education levels, cultural history, policy, knowledge and attitudes among others and different causal relationships amongst these.

*4. Despite external influence, most learning has been achieved through social interactions amongst communities of practice and with the practice*

In Cata, through social interactions and relationships, people have acquired knowledge such as rainwater harvesting and invasive alien plant control amongst others. This process has resulted in community members acquiring knowledge in IWRM practices (shared repertoire), which they are able to communicate and share with other people. As argued by Daniels (2008: 99), “knowing and doing are reciprocal – knowledge is situated and progressively developed through activity... Learning is understood as a process which is often tacit and takes place through shared or joint action and has a generative effect on the pattern of activities in which it occurs”. External influences such as training programmes were found to influence the learning, but these social interactions amongst communities of practice, and with the practice were important learning interactions that extend and contextualise external training programmes, and offer a wider range of learning experiences.

*5. Learning has taken place through facilitated interventions*

Community members in the three selected community of practices are also learning from facilitated training programmes. Learning occurs through training workshops facilitated by the Working for Water project, Border Rural Committee, Cata Communal Property Association, Department of Water Affairs, Department of Agriculture and other rural development Non-Governmental Organisations.

## **6.4 RECOMMENDATIONS**

The recommendations presented have been drawn from the analytical statements presented in Chapter 5, which also formed the key findings of the study. The thick descriptions provided around the findings in Chapter 4 gave a sound basis to support the recommendations that have been proposed in this chapter. As this research was conducted as a case study, recommendations are mainly contained within the case, but may be useful starting points for others concerned with similar issues in other contexts. I use Bassey’s (1999) recommendation of ‘fuzzy generalization’ from case study which allows

the researcher to make recommendations that may have wider relevance, but to temper these with an element of tentativeness.

1. It has been seen in this study that communities are learning everyday through participating in water management practices. It may therefore be, in other similar contexts, useful to encourage communities to be actively involved in communities of practice as it creates a platform and space for social interactions and learning.
2. In this study, there is evidence that many aspects of natural resource management, including water allocation and usage, are regulated by traditional institutions and structures, which have not been formally considered in the newly-proposed structures under the National Water Act of 1998. Indigenous and traditional management approaches appear to represent a considerable contribution to regulating access to water resources (Burt et al., 2006). It may therefore be important to develop strategies that support structures for community participation and learning in IWRM that have developed around a practice and that also recognise local cultures and value local knowledge.
3. In this study it has been noted that causal factors and underlying structures and mechanisms and the interplay between these factors influence and shape participation and learning in open systems. It seems that it is therefore important to analyse and understand the diverse contextual factors and structural mechanisms that influence participation and learning in communities of practice in similar contexts.
4. In this study it has been noted that outside influences through facilitated training, and extension support services have had an influence on learning in communities of practice. However, data has indicated that most learning has been achieved through social interactions amongst communities of practitioners and with the practice. It seems therefore that it is as important to support and encourage the social learning interactions occurring within and between communities of practice *in situ*, but also to recognise the influence of external training programmes and how they interface with these social interactions and learning processes that take place within the *in situ* communities of practice.

5. It is evident in the case of Cata that people are working together in communities of practice to share knowledge, best practices, and to respond and adapt to issues such as poverty, water scarcity, unemployment and their associated risks that are before them. It therefore seems important to establish and develop participation structures that will address communities' concerns and needs, and that, at the same time, will strengthen their abilities to learn new practices related to IWRM in ways that are integral to other practices that are significant and meaningful in these contexts such as food production.

## **6.5 AREAS FOR FUTURE RESEARCH**

The use of social learning theories such as situated learning in communities of practice and critical realism theory have been useful tools in understanding social learning processes and interactions through local actions and practices and the various mechanisms and events that influence participation and learning opportunities in IWRM practices. These ideas helped me develop in-depth insights of learning in communities of practice and allowed me to formulate recommendations to strengthen and support learning processes that facilitate the development of capacities of local communities which have remained a challenge for effective implementation and sustainability of community projects.

Further research needs to be undertaken to understand how contextual factors and the interplay between these causal factors influence participation and learning opportunities. There is a need to look at how the use of the English language during facilitated training, use of mediation tools that are not locally contextualised and low education levels of communities members influence learning in participation frameworks. However, as indicated in Section 3.8, there are limitations working with a community of practice framework as it does not adequately theorise power relations or the role of language in learning. It can also lead to problems of conservatism, due to its reliance on contextual/situated learning analysis which discounts wider knowledge and structural influences (Lotz-Sisitka, 2008). In this regard, it is important to complement the community of practice analysis with a sound historical and wider contextual analysis (Downsborough, 2009) and critical realism so as to understand other contextual factors that influence learning processes.

Reflecting on Hammond et al.'s (2001) deliberations (as reported on in Section 2.4.3) in which they argue that the social context created within the social interactions, the ways in which communication, and opportunities for collaboration are structured, all influence the learner's understanding and

construction of knowledge. This study has pointed to some interesting aspects of researching these elements, but further research on this dynamic of the social-cultural learning process are possible.

## **6.6 CONCLUSION**

The study has illuminated some key findings of how social learning processes and interactions have occurred in Cata as communities participate in IWRM practices. The study has shown that people are learning through social learning interactions with other community members as they engage in their daily water management and food production practices. Learning interactions take place through both informal and formal processes such as meetings, training workshops, conversations and interactions with outsiders (researchers, consultants & extension officers).

The study has also shown that there are a number of challenges that appear to exist in these learning contexts. For instance it was found that participation and social learning processes and interactions are influenced by a range of causal mechanisms that are contextual, some of which can be addressed through contextualisation of training programmes in the local community of practice. These insights into how communities learn, as well as the tensions and difficulties that are experienced in the learning processes are important for furthering learning and participation in community-based IWRM practices, projects and programmes.

I hope that this study has provided useful insights into understanding community learning through social processes and interactions that may contribute to effective and sustainable management of natural resources at community level.

## 7.0 REFERENCES

- Anderson, J., & Axelsson, L. (2005). *Cata – A former homeland village affected by Betterment, Eastern Cape, South Africa*. Kristianstad University, Sweden
- Babikwa, D. J. (2004). Tensions, Contradictions and Inconsistencies in Community-Based Environmental Education Programmes: The role of defective Educational theories. *South African Journal of Environmental Education*, 21: 58-74
- Bassey, M. (1999). *Case study research in educational settings*. Buckingham: Open University Press.
- Beckett, D. & Hager, P. (2002). *Life, Working and Learning: Practice in Postmodernity*. London: Routledge
- Benzie, D., Mavers, D., Somekh, B., & Cisneros-Cohernour, E.J. (2005). Communities of practice. In Somekh, B. & Lewin, C. (Eds), *Research Methods in Social Sciences*. London: Sage.
- Bhaskar, R. (1998). Philosophy and Scientific Realism. In Archer, M. and Bhaskar, R. (Eds.), *Critical Realism: Essential Readings*. Canada: Routledge
- Bhaskar, R. (2008). *A Realist Theory of Science*. London: Verso
- Billet, S. (2004). Workplace participatory practices: Conceptualising workplaces as learning environments. *The Journal of Workplace Learning*, 23(1), 19-35
- Border Rural Committee. (2007). *The Cata Story*. East London, South Africa
- Brown, J. (2011). Assuming too much? Participatory water resource governance in South Africa. *The Geographical Journal*, 177 (2)171–185.
- Brown, J., & Duguid, P. (2001). Knowledge and Organisation: A Social Practice Perspective. *Organisation Science*, 12 (2) 198-213.
- Burt, J., & Berold, R. (2011). *Investigating water knowledge flow to communities most at risk*. Research Report K8/813 ; Pretoria : Water Research Commission.
- Burt, J., du Toit, D., Neves, D., & Pollard, S. (2006). *Learning about participation in integrated water resources management: A South African review*. WRC, Pretoria, South Africa
- Clapper, V, A. (1996). Positioning citizen participation in democratic local government. In Bekker, K. (Ed.), *Citizen Participation in Local Government* (pp, 51-78). Van Schaik Publishers, Pretoria,
- Cohen, L., & Manion, L. (1994). *Research Methods in Education*. (4<sup>th</sup> ed.). London: Routledge.
- Cohen, L., Manion, L., & Morrison, K. (2000). *Research methods in Education*. (5<sup>th</sup> ed.). London: Routledge Falmer.
- Cohen, L., Manion, L., & Morrison, K. (2007). *Research methods in Education*. (6<sup>th</sup> ed.). London: Routledge Taylor & Francis Group

- Collins, K., Blackmore, C., Morris, D., & Watson, D. (2007). A systemic approach to managing multiple perspectives and stake holding in water catchments: some findings from three UK case studies. *Environmental Science and Policy* 10, pp. 564-574.
- Colvin, J., Ballim, F., Chimbuya, S., Everard, M., Goss, J., Klarenberg, G., Ndlovu, S., Ncala, D., & Weston, D. (2008). Building Capacity for Co-operative Governance as A Basis for Integrated Water Resource Managing in the Inkomati and Mvoti Catchments, South Africa. *Water SA* .34 (6), Pretoria
- Cundill, G. (2010). Monitoring social learning processes in adaptive co-management: three case studies from South Africa. *Ecology and Society* 15(3).
- Danermark, B., Ekstrom, M., Jakobsen, L., & Karlsson, J.C. (2002). *Explaining Society: Critical Realism in the Social Sciences*. London. Routledge
- Daniels, H. (2008). *Vygotsky and Research*. London: Routledge
- Daniels, S. E., & Walker, G. B. (2001). *Working Through Environmental Conflict: The collaborative Learning Approach*. Westport, Connecticut and London: Praeger.
- Denzin, N, K., & Lincoln, Y. S. (Eds) (2003). *The Landscape of Qualitative Research: Theories and Issues*. Second Edition: London: SAGE
- Downsborough, L. (2007). *Understanding Social Learning Processes in a Citrus Farming Community of Practice*. Unpublished master's thesis, Rhodes University, Grahamstown.
- Downsborough, L. (2009). Understanding Social Learning Processes in a Citrus Farming Community of Practice. *Southern African Journal of Environmental Education*, 26, pp. 167-175.
- Field, J. (2003). *Social Capital. What is social capital and why does it matter?* London: Routledge.
- Fuller, A. (2007). Critiquing theories of learning and communities of practice. In Hughes, J., Jewson, N., & Unwin, L. (Eds.), *Communities of practice: Critical perspectives* (17-29). London, Routledge.
- Gebremedhin, H. S., & Theron, F. (2007). Locating community participation in a water supply project - the Galanefhi Water Project (Eritrea). *Anthropology Southern Africa*, 30 (1&2)
- Global Water Partnership. (2009). Strategy. Retrieved on 11/11/11 from [www.gwpforum.org](http://www.gwpforum.org)
- Groff, R. 2000, 'The truth of the matter: Roy Bhaskar's critical realism and the concept of alethic truth', *Philosophy of the Social Sciences*, vol. 30, no. 3, pp. 407–35.
- Goss, J. D., & Leinbach, T. R. (1996). Focus groups as alternative research practice. *Area* 28 (2), 115-123
- Grimble, R., & Wellard, K. (1997). Stakeholder methodologies in natural resource management: a review of principles, contexts, experiences and opportunities, *Agricultural Systems*, 55 (2), 173-193.
- Gumbo, B., Van Der Zaag, P., Robinson, P., Jonker, L. and Buckle, H. (2004). Training needs for water demand management. *Physics Chemistry Earth Parts A/B/C* 29 (15-18), 1365-1373.
- Handley, K., Sturdy, A., Fincham, R., & Clark, T. (2006). Within and Beyond Communities of Practice: Making sense of learning through participation, identity and practice. *Journal of Management Studies*, 43 (3), 640-653.

- Haddad, F., Al Zoubi, R., Alaween, M., & Shraideh, F. (2007, March). *Local Community Participation for Sustainable Water Resource Management*. Paper presented at MEDA WATER International Conference on Sustainable Water Management, Tunis, Tunisia. Retrieved on 11/11/11 from <http://www.zer0-m.org/medawaterconf/index.htm>
- Hammond, L., Austin, K., Orcutt, S., & Rosso, J. (2001). *How People Learn: Introduction to Learning Theories*. Retrieved on 12/11/11 from [www.stanford.edu/class/ed269/hpintrochapter.pdf](http://www.stanford.edu/class/ed269/hpintrochapter.pdf)
- Herrfahrdt-Pähle, E. (2010). South African Water Governance Between Administration and Hydrological Boundaries. *Climate and Development Journal*, 2, 111-127.
- Herold, C. E. (2009). The Water Crisis in South Africa. Sourced on 01/04/11 from C:\Documents and Settings\02569\My Documents\Articles\Institutional\water Crisis in SA 708-paper C
- Hoffman, T., & Ashwell, A. (2001). *Nature Divided: Land degradation in South Africa*, University of Cape Town Press, Lansdowne.
- Ibarra, H. (1999). 'Provisional Selves: Experimenting with Image and Identity in Professional Adaptation'. *Administrative Science Quarterly*, 44, 764-791
- Jackson, S. J. (2009). *Research Methods and Statistics: A Critical Thinking Approach*. (3<sup>rd</sup> ed.). WADSWORTH Cengage Learning.
- Janse van Rensburg, E., & Lotz-Sisitka, H. (2000). *Learning for Sustainability: an environmental education professional development case study informing education policy and practice*. Learning for Sustainability Project: Johannesburg.
- Jiggins, J., van Slobbe, E., & Roling, N. (2007). The organisation of social learning in response to perceptions of crisis in the water sector of The Netherlands. *Environmental Science and Policy* 10, pp. 526-536.
- Jonch-Clausen, T., & Fugl, J. (2001). Firming up the Conceptual Basis of Integrated Water Resources Management. *Water Resources Development*, 17(4), 501-510.
- Jones, B. T. B., & Murphree, M. W. (2004). Community-Based Natural Resource Management as a Conservation Mechanism: Lessons and Directions. In Child, B. (Ed). *Parks in transition: Biodiversity, rural development and the bottom line*. Earthscan. London, pp 63-103
- Kliksberg, B. (2000). Six unconventional theses about participation: International Review of Administrative Sciences. *An International Journal of Comparative Public Administration*, 66 (1), 161-174.
- Lather, P. (1986). Issues of Validity in Openly Ideological Research: Between a Rock and a Soft Place. *Interchange* 17 (4), 63-84.
- Lave, J. (1988). *Cognition in Practice: Mind, Mathematics, and Culture in Everyday Life*. Cambridge: Cambridge University Press.
- Lave, J., & Wenger, E. (1991). *Situated Learning: Legitimate Peripheral Participation*. Cambridge: Cambridge University Press.
- Litosseliti, L. (2003). *Using Focus Groups in Research*. London: Continuum

- Lotz-Sisitka, H. B. (2008). *Change Oriented Learning and Sustainability Practices*. A SAQA/Rhodes University Research Programme Proposal. Rhodes University, Grahamstown, South Africa.
- Lotz-Sisitka, H. (2009). Insights from an environmental education research programme in South Africa. In L. Cooper & S. Walters (Eds.), *Learning/Work: Turning work and lifelong learning inside out*, (pp, 351-363). Cape Town: HSRC Press
- Lotz-Sisitka, H. (2011, August). *Situated and Social Learning Processes: A Brief Introduction*. Paper prepared for the annual CBNRM short course, Rhodes University, Grahamstown
- Lotz-Sisitka, H., & Burt, J. (2006). *A Critical Review of Participatory Practice in Integrated Water Resource Management*. WRC Report No. 1434/1/06
- Lupele, J.K. (2004). *Contextual profiling as a methodology in Environmental Education Research*. Unpublished master of education paper. Rhodes University: Grahamstown.
- Lupele, J.K. (2007). *Networking: Enabling Development and Institutionalisation of Environmental Education Courses in Southern Africa*. Unpublished PhD thesis, Rhodes University, Grahamstown.
- Masara, C. (2010). *Learning Commercial Beekeeping: Two cases of Social Learning in Southern African Community Natural Resource Management Contexts*. Unpublished master's thesis, Rhodes University, Grahamstown.
- Maxwell, A. M. (1992). Understanding and Validity in Qualitative Research. *Harvard Educational Review*, 62 (3), 279-300.
- Mertens, D.M. (2005). *Research and Evaluation in education and psychology: Integrating diversity with quantitative and mixed methods* (2<sup>nd</sup> ed.). Thousand Oaks: Sage.
- Mirumachi, N., & Van Wyk, E. (2010). Cooperation at different scales: challenges for local and international water resource governance in South Africa. *The Geographical Journal*, 176 (1), 25–38
- Pahl-Wostl, C., & Hare, M. (2004). Processes of Social Learning in Integrated Resources Management *Journal of Community & Applied Social Psychology*, 14, pp. 193–206
- Pahl-Wostl, C. (2006). The importance of social learning in restoring the multifunctionality of rivers and floodplains. *Ecology and Society* 11 (1)
- Pahl-Wostl, C., Craps, M., Dewulf, A., Mostert, E., Tabara, D., & Taillieu, T. (2007). Social Learning and Water Resources. *Ecology & Society*, 12 (2).
- Pahl-Wostl, C. (2007). Transitions towards adaptive management of water facing climate and global change. *Water Resource Management*, 21, 49–62
- Patton, M. Q. (1990). *Qualitative Research and Evaluation Methods* (2nd ed.). London: Sage Publications.
- Patton, M.Q. (2002). *Qualitative Research and Evaluation Methods*, (3rd ed.). Sage Publications, California.
- Philips, D.C., & Soltis, J.F. (2004). *Perspectives on learning*. (4<sup>th</sup> ed.). Teachers College. Columbia University.



Phiri, C. (2011a). *Working for Water Programme: An Integrated Community-Based Approach to Water Resources management in Cata, Eastern Cape, South Africa*. Unpublished Masters Contextual Profiling Assignment 1, Rhodes University, Grahamstown.

Phiri, C. (2011b). *A Critical Review of Learning Support Materials: Catchments, Sustainability and the Reserve*. Unpublished Masters Assignment 2, Rhodes University, Grahamstown.

Pesanayi, T.V. (2008). *Investigating Learning Interactions Influencing Farmers' Choices of Cultivated Food Plants*. Unpublished Master's thesis, Rhodes University, Grahamstown.

Pesanayi, T. (2009). A Case of Exploring Learning Interactions in Rural Farming Communities of Practice in Manicaland, Zimbabwe. *Southern African Journal of Environmental Education*, 26, pp. 64-73

Pollard, S., & Walker, P. (2000). Catchment Management and Water Supply and Sanitation in the Sand River Catchment, South Africa: *Description and Issues*. Association for Water and Rural Development, Bushbuckridge, South Africa. Retrieved on 18<sup>th</sup> February 2011 from [www.award.org.za/](http://www.award.org.za/)

Pollard, S. (2002). Operationalising the new water act: contributions from the save the sand project - an integrated catchment management initiative. *Physics and Chemistry of the Earth*, 27, pp.941-948.

Pollard, S., & du Toit, D. (2005). Achieving Integrated Water Resource Management: *The Mismatch in Boundaries between Water Resources Management and Water Supply*. Retrieved on 18<sup>th</sup> February, 2011 from [www.award.org.za/](http://www.award.org.za/)

Pretty, J.N. (1995). Participatory learning for sustainable agriculture. *World Development*, 23 (8), 1247-1263

Reed, S. M. (2008). Stakeholder participation for environmental management: a literature review. *Biological Conservation*, 141, 2417-2431

Reed, S. M., Evely, C. A., Cundill, G., Fazey, J., Laing, A., Newig, J., Parrish, B., Prell, C., Raymond, C., & Stringer, C. L. (2010). What is Social learning? *Ecology and Society*, 15 (4).

Reid, A., Jensen, B. B., Nikel, J., & Simovska, V. (Eds) (2008). *Participation and Learning: Perspectives on Education and the Environment, Health and Sustainability*. Springer

Republic of South Africa. Department of Water Affairs. (1995). *White Paper on National Water Policy*. Pretoria: Government Printer.

Republic of South Africa. Department of Water Affairs. (2004). *National Water Resource Strategy*. Pretoria: Government Printer.

Republic of South Africa. Department of Planning and Local Government. (2005). *National Policy Framework for Public Participation*. Pretoria: Government Printer.

Republic of South Africa. Department of Public Works. (2008). *Expanded Public Works Training Strategy*. Pretoria: Government Printer.

Rickinson, M. (2006). Researching and understanding environmental learning: hopes for the next 10 years. *Environmental Education Research*, 12, pp. 445-457

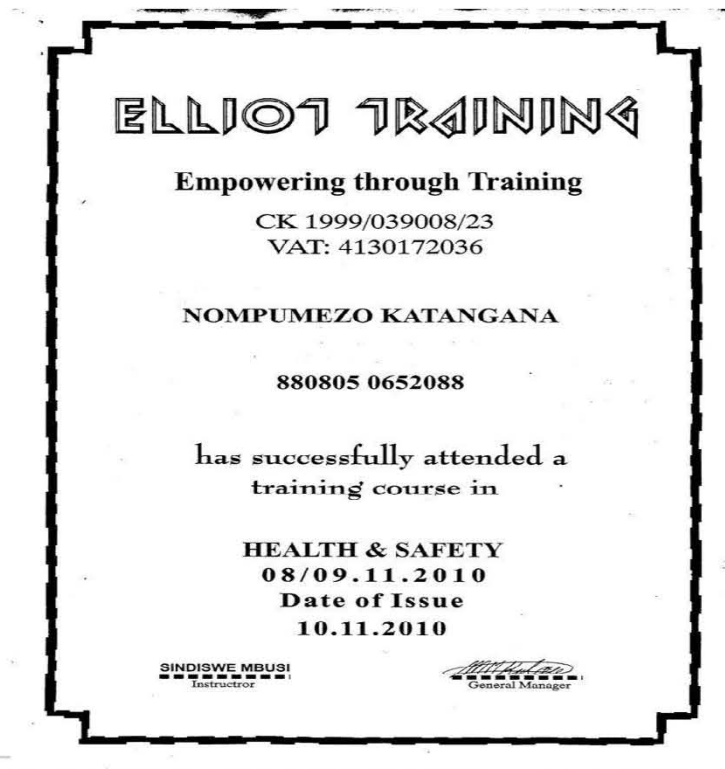
Sarason, B.S. (2004). *And what do you mean by learning?* Portsmouth: Heinemann

Sayer, A. (2000). *Realism and Social Science*. London, Sage.

- Sfard, A. (1997). On Two Metaphors for Learning and the Dangers of Choosing Just One. *Educational Research*, 27(2), 4-13
- Shumba, O., Kasembe, R., Mukundu, C., & Muzenda, C. (2008). Environmental Sustainability and Quality Education: Perspectives from a community living in a context of poverty. *Southern African Journal of Environmental Education*, 25, pp. 81-97.
- Silverman, D. (2010). *Doing Qualitative Research*. (3<sup>rd</sup> ed.). London: SAGE
- Smith, M. K. (1999). 'Learning Theory', *the encyclopedia of informal education*, Retrieved on 21<sup>st</sup> March from [www.infed.org/biblio/communities\\_of\\_practice.htm](http://www.infed.org/biblio/communities_of_practice.htm)
- Smith, M. K. (2003). 'Communities of practice', *the encyclopedia of informal education*, Retrieved on 21<sup>st</sup> March from [www.infed.org/biblio/communities\\_of\\_practice.htm](http://www.infed.org/biblio/communities_of_practice.htm)
- Stayaert, P., Barzman, M., Billaud, J., Brives, H., Hubert, B., Ollivier, G., & Roche, B. (2007). The role of knowledge and research in facilitating social learning among stakeholders in natural resources management in the French Atlantic coastal wetlands. *Environmental Science and Policy* 10, pp. 537-550.
- Stein, D. (1998). Situated learning in adult education. *Eric Digest*. Retrieved on 25<sup>th</sup> March 2011 from <http://www.ericdigests.org/sdult-education/html>
- Sultana, F. (2009). Community and participation in water resources management: gendering and nurturing development debates from Bangladesh. *Royal Geographical Society*, 34 (3).
- Umhlaba Consulting (2008). *Strategies to Support South African Smallholders as a Contribution Government's Second Economy Strategy*. Cata Irrigation Scheme: A Case Study Report
- Wals, A.E.J., & Heymann, F.V. (2004). 'Learning on the Edge: Exploring the change potential of conflict in social learning for sustainable living'. In A.L. Wenden (Ed.), *Educating for a culture of Social and Ecological Peace*, New York, pp. 123-145.
- Wals, A. E. J. (2007). Learning in a Changing World and Changing in a Learning World: Reflexively fumbling towards sustainability. *Southern African Journal of Environmental Education*, 22.
- Wals, A. E. J., van der Hoeven, N., & Blanken, H. (2009). *The acoustics of social learning: Designing learning processes that contribute to a more sustainable world*. Netherlands: Wageningen Academic Publishers.
- Warner, J. F. (2006). More Sustainable Participation? Multi-Stakeholder Platforms for Integrated Catchment Management. *Water Resources Development*. 22 (1), 15–35
- Wenger, E. (1998). *Communities of practice: Learning, meaning and identity*. Cambridge: Cambridge University Press.
- Wenger, E. (2007). *Communities of Practice: A brief Introduction*. [www.ewenger.com/theory/index](http://www.ewenger.com/theory/index)
- Yin, R. K. (2003). Case Study Research Design and Methods (3<sup>rd</sup> ed.). In Brickman, L & Rog. D. J (Eds.), *Applied Social Science Research Methods Series Volume 5*. Thousand Oaks: SAGE
- ZCBNRMF. (2009). *The Strategy for 2009 – 2014*. WWF, Zambia Country Office. Lusaka

## 8 APPENDICES

### Appendix I: Copies of certificates given to participants of the training programmes



## HKS TRADING

This is to certify that  
*Nophumezo Katangana*  
Identity Number  
8808050652088

Has successfully completed the following course  
in

*HERBICIDE APPLICATOR*

From 15 November to 17 November 2010  
Date of Issue: 30 November 2010

A. TANTSI

INSTRUCTOR

  
MANAGING DIRECTOR

## **Appendix II: Interview Schedule for semi-structured interviews**

1. What is your role in this project that you are involved in?
2. What activities do communities/people participate in?
3. Why are people participating in the project?
4. Why did the project start in Cata community?
5. How are people engaged to participate in the project?
6. How do they learn to do project activities?
7. What do people learn?
8. What influences learning amongst the people?
9. How do communities share knowledge/information amongst themselves and with others in the villages?
10. What problems do workers experience when participating in the project?
11. How are these highlighted problems addressed?
12. What incentives/benefits are in place to foster community participation in WFW activities?
13. What social factors/interactions are sustaining these WRM activities?

## Appendix III: Transcribed key informant interview with Department of Water Affairs

Date: 01/Sept/2011

C – Charles (Researcher); K4 – Respondent

- C *What is your role in the Department of Water Affairs (DWA)?*  
K4 I am the Assistant Director for DWA
- C *Who is in charge of WFW project between DWA and DAFF?*  
K4 Working for Water (WFW) project was until April 2011 under Department of Water Affairs (DWA). But it is currently under Department of Environmental Affairs (DEA).
- C *What is now the role of DWA in WFW Project?*  
K4 DWA has no role in WFW Project directly, though what the WFW Project does has a direct impact on water resources management which is our mandate.
- C *Was the project your responsibility before April 2011?*  
K4 Yes. Though the role has now changed. Nevertheless, DEA and DWA are departments falling under one ministry; the Ministry of Water and Environmental Affairs (MWEA).
- C *Does Cata fall within your jurisdiction?*  
K4 DWA is a national department and has regional offices with officers. What ever happens within a region that has to do with water issues is reported to DWA in King Williams Town. Additionally we also have satellite offices nationwide.
- C *Why did WFW Project start its activities including in Cata?*  
K4 Let's just pick the WFW itself as a project. You know there is what we call Invasive Alien Plants (IAPs). These are foreign plants and some have been declared invasive because of what they do. They invade spaces for indigenous plants and they also take up a lot of water. What makes them resistant is that they do not have enemies in South Africa. Like if you get certain insects that feed on certain plants, it can be controlled as such. But if you take a plant from Australia for instance and bring it here which do not have insects or organisms to feed on it, it will not be controlled but proliferate. By virtue of them not being controlled, they take up a lot of space and water because they have spreading roots and have become a big challenge. That is why they are being eliminated or controlled. They are being managed because they can not be gotten rid of completely.
- C *Why did you involve communities to participate addressing the IAPs issues?*  
K4 You will notice that DWA is a government department and government departments work through community-based approaches. This is very advantageous because you can easily manage the project. If you are on site you can easily pick up what is going on. The other thing is that the Working for Water project works towards poverty alleviation. It provides jobs and communities get paid and in a way it is creating jobs. The project is eradicating poverty in a way. As communities work, they earn money, buy food, clothes and other requirements that they need
- C *What incentives are in place to foster community participation in WFW activities?*  
K4 From the Department's side and in the long term, if you eradicate IAPs, you are maximising chances of getting more water. So for these communities that are not getting water currently it means the first point of management are the catchment areas. That's where you get all the water flowing from. So if you eradicate IAPs you are maximising chances of getting more water. DWA is not looking at just here and now but at the long term benefit of the project. The availability of and clean water and poverty alleviation are the two key issues being looked at.
- C *Have you found out what really drives the communities to participate in this project?*  
K4 I have never worked with the WFW project and would not know why
- C *Just like any other job, how then do people learn to do project activities? How do you ensure that people you engage from the community have the necessary skills to do the job?*  
K4 These people get trained because when you recruit them you have to call your skills analyst to see what level of literacy and competency they have. We do undertake a skills assessment to establish what kind of training the people will need and the level of training because there is no point taking an advanced training to people who

can't use it. For example chainsaw training has to be provided because it is a very dangerous activity and is needed to do this kind of work under the Working for Water project. Other training provided includes training such as biological control.

C *What challenges are you facing in terms of communities participating in the project?*

K4 I do not want to lie because I have never worked with communities. I work with schools where I disseminate information in as far as WFW project is concerned and the IAPs to be specific.

C *How then do you educate the people not working on the project about IAPs and water resources management?*

K4 For questions specific to WFW project I have no answers. However, I will only give my opinion. As DWA we have a project called 2020 where we are working directly with schools where we disseminate information through learners with the hope that they will pass on the message to others (*friends and families*). We provide them with brochures, lessons, hands on activities and organise field trips where we show learners how to address issues such as water hyacinth in rivers.

C *In the training provided to communities accredited with South Africa Qualification Authority (SAQA)?*

K4 Yes, both training and providers of the training are accredited with SAQA. The project sources for professional service providers who are accredited with South African Qualifications Authority

C *How do you value and make use of community knowledge on WRM? Do you build on their existing knowledge that they have?*

K4 I will only give my observations. So far I have not seen communities working towards conserving water. The department have a program called rainwater harvesting where we assist communities that do not have water infrastructure in place to try and harvest rain water and they are equipped in terms of water quality issues because the water is untreated. What we advocate for because the ones that benefit most on the project are the rural communities and that is where you get people with very low education. So you can not give them advanced methods of water treatment. We train them how to treat water through boiling.

Regarding community knowledge, so far what I have seen is the negative attitudes when it comes to water resources management. You get them polluting rivers, wasting water and there are no best practices. Even when you go to schools all you find are leaking taps, leaking toilets because demand for water conservation and management is not there. I can not therefore attest to what you are saying and some of them do not know that some plants which they have within their areas (localities) are invasive alien plants like the guava and prickly pear. When I tell them they even get shocked.

C *How then do you reconcile tensions with communities in situations where you need to eradicate IAPs which communities have found value in?*

K4 Like prickly pear is the most water waster. Just a leaf from it can fill a glass. It therefore must be removed. How the WFW project handles such issues I am not aware. But when I go to schools I advocate that they must try by all means to remove those plants including guava because they are also alien plants. These IAPs have been classified into weeds and commercial. Prickly pears because they take up a lot of water and have no commercial value, they are classified as weeds. For black wattle it is a commercial invasive alien plant.

C *How do you resolve issues pertaining to commercial IAPs?*

K4 The commercial IAPs are managed and controlled through enforcement. That's why you have to get licences to have a plantation.

C *Why does the WFW project target women, children and the disabled?*

K4 It's a quota system and also a policy issue. The project is trying to target groups that were previously disadvantaged or marginalised. The policy has now been revised from 30% to 50% representation of the disadvantaged or marginalised in order to create a balance.

C *What structures are available for community participation in water resource management activities?*

K4 The Water User Associations are the available structures. Previously, they were called irrigation boards solely for big commercial farmers but they have now been transformed into Water User Associations. They constitute both former irrigation boards and other individual water users whether big or small.

C *How sustainable is the WFW project?*

K4 The project will continue to exist because it is more of a political issue than anything else. Due to its job creation connotation, it has become political and is a flagship of the government which has been prioritised. It is also one of

the community-based projects that create more jobs in South Africa. It is a government project working closely with the Extended Public Works Programme (EPWP) and it gets funded.

C *Is the department developing other initiatives or strategies that will enhance sustainability through continued participation of the local communities?*

K4 That is the department's (DWA) ultimate goal not to create dependency on government. The overall goal is to leave the project with communities who should see the value and benefits of it. Communities should initiate micro-projects within the WFW project such as growing of crops and selling them once enough/ adequate water has been conserved.

C *How will you ensure that communities have the capacities to continue to management the project sustainably if given a chance to do so?*

K4 DWA, through the WFW project provides training to communities where the project is taking place. However, we are still grappling with the issue of language especially during training workshops.

C *How is the use language during training addressed?*

K4 The use of English as a language during training is a serious barrier especially for low educational areas like Cata. I am saying this through observations because we do have resource materials as the 2020 vision which are all in English for Grades R to 9. We have been calling for the materials to be translated but money is the challenge. However, even if we translate them what guarantee that the materials will be translated the way they where? There is also what we call language of vicinity, your jargon.

Language is surely affecting the overall objective of the project because if people do not understand the language used, then they can not execute their work as they might also misinterpret the meaning. Most of the people in rural areas are the un-educated and the un-employed which is our target communities for the project.

C *Are there policies or plans in place that support or enhance community participation in water resource management?*

K4 The WFW project is the only project being implemented at municipality level by DWA. It should have been Amatole District Municipality in the case of Cata who can then appoint Amathlathi to implement the project on their behalf. However, this is being reviewed and there are policies that are already in place like the National Policy framework for Public Participation of 2005 which promotes public participation in water resource management in their localised areas.

C *Thank you Madam Assistant Director for your time and valuable information provided*

K4 Thank you too, for the interesting discussions.



## Appendix IV: Transcribed semi-structured interview with Working for Water Contractor

Date: 28/June/2011

### C – Charles (Researcher); S1 – Respondent

- C *What is your role in this project that you are involved in?*  
S1 I am the Contractor for the Working for Water (WFW) project here in Cata. I supervise the workers who are hired to work on the project by ensuring that work is done as specified in the contract agreement.
- C *What activities do communities/people participate in?*  
S1 Community members are being engaged to eradicate wattle forests and other alien plants from major water catchments areas, agriculture and grazing lands, and homesteads. Apart from wattle eradication, workers are also trained in other areas such as occupational skills, environmental awareness and health education, and life skills to empower them.
- C. *When did WFW activities start in Cata?*  
S1 WFW Programme activities in Cata started in 2010 as a result of the black wattle and other invasive alien plant species problems that we were experiencing here in Cata.
- C *Why are people participating in the project?*  
S1 There are a number of reasons:-
  - In order to enhance water security in the area by increasing water supply through invasive alien plant removal by mechanical and chemical methods in river banks.
  - To restore the productive potential of land through removal of black wattle forests/plantations and other alien plant species to manageable levels so to address the problems caused by black wattle and other invasive alien plant species in Cata.
  - For employment and as a source of livelihood
  - Others participate so that they get training which can help them look for better jobs because these jobs they have here are just short contracts of only up to 3-4 months.
- C *Under which Government Department is the WFW project falling?*  
S1 It is the WFW program. No, it is under the Working for Forest Programme. If it were a WFW programme we would have been working across the rivers, but we are working in the forest plantations. However, all the projects are under the WFW program. Our contact managers are under DWA now Department of Environmental Affairs (DEA) falling under the Ministry of Water and Environmental Affairs (MWEA).
- C. *Why are communities participating in the WFW project?*  
S1 There are a number of reasons why community members are involved.
  - As a source of livelihood,
  - Employment opportunities,
  - In order to address the issues and risks caused by IAP species of water shortage; “most streams that are tributaries of Cata River which were infested with wattle had only pools of water in them which caused a lot of shortages”,
  - Poverty,
  - Life skills development process,
  - To enhance water security by increasing water supply through invasive alien plant removal by mechanical and chemical methods in river banks.
  - To restore the productive potential of land through removal of black wattle forests plantations and other alien plant species to manageable levels. In Cata, IAPs had generally dominated native species for space, nutrients, water and other necessities. This had resulted in significant transformation of habitats due to high levels of infestation and reduction in native species population. They had degraded the rich biological diversity of the area resulting in habitat modification and in certain cases destruction. Although these IAPs were originally grown in commercial plantations for communal use they were creating enormous impacts in that they had spread to upper catchment of the rivers and other areas such as arable lands for agriculture and animal grazing areas. These invasions had led to almost a complete extermination of local plant population
- C *How are people engaged to participate in the WFW project?*

S1 Community members wishing to be employed submit their names with the Cata CPA or elected chairpersons in their respective villages. Once a WFW project activity is initiated, a list of would be workers is sourced from the CPA to work on the WFW project. The Cata CPA coordinates all developmental programs in Cata.

C *How do the workers learn these WFW activities?*

S1 This is done through the following:-

- Through training workshops organised by the WFW project where they hire consultants as service providers to train the workers.
- Through on-field undertaking of the work activities – many people learn through doing the actual work in the field.
- Through the apprenticeship approach where slow and new learners are paired with old and experienced workers so that they can observe, ask questions and eventually learn how to do it themselves.
- However, the experienced workers sometimes become very harsh to other workers (*new workers*) and this affects how they learn as some are afraid of asking questions. The manager of the team also demonstrates to the workers especially when they are out in the field.

C. *How do communities share knowledge/information amongst themselves?*

S1 Through work activities, they talk and ask each other questions and in the process, workers are learning. Through the apprenticeship approach where slow learners are also paired with fast and experienced workers promotes learning amongst workers. The team manager also debriefs the workers regularly as a way for them to learn.

C. *How do workers share knowledge/information with other communities in the villages?*

S1 The WFW project attends monthly meetings with the Cata Communal Property Association committee which then provide information to the community members on a quarterly basis. The information provided to Cata Communal Property Association is readily available to community members who wish to access information on the WFW project activities.

C *How is the work relationship amongst the workers?*

S1 There is this attitude that I have been observing for some time to workers that I pair to work with the slow learners and new workers. When it comes to doing activities, they always say there is a way in which we do them here. And so if a new worker reminds the old worker about something they think they have not done, they would say I have been here for some time, so what can you tell me. Sometimes old workers do not show the new workers all that is needed to do the work for fear that the new workers can more than them and would eventually take up their jobs. Some experienced community members are harsh to new learners during the apprenticeship process and this affects how they learn as some workers are afraid of asking further questions.

C *How do you ensure then that all workers are at the same level of activity implementation?*

S1 We have a spirit of team work. We identify those workers who are doing the work perfectly well and pair them with slow learners or new workers with less experience so they can assist them to develop competences over time. As manager, I also debrief workers everyday before we start our work so that everyone is on the same level. This also gives chance for others to ask questions and learn.

C *How do you assess the work performance of workers?*

S1 We have a site inspection form that assesses the performance of the work done. It is not for individual performance but group performance.

C *Do you conduct refresher courses for the workers engaged on the job?*

S1 For sure. For example we will be having a refresher course this year because the last one was held in November 2010. But there is a problem because sometimes the service providers come up with what they know and not what the people want as beneficiaries of the training. Sometimes the training is not specific and does not address our needs. If you want to deliver something to the people, it is important that you ask the intended beneficiary what their needs or requirements are. You can never deliver something to people without understanding if they need it. You therefore need to consult the people or beneficiaries of the services that they need in order that what you are providing will be helpful and beneficial to them and their work. As a Manager I pass on my needs and that of the workers to the WFW Managers who then inform the Service Providers. Despite that they come up with their own training specifications

The other is that if you want to deliver something to the people, it is important that you ask the intended beneficiary what their needs or requirements are. You can never deliver something to people without

understanding if they need it or not. You therefore need to consult the people or beneficiaries of the services they need in order that what you are providing will be helpful and beneficial to them and their work.

Since I am the one who interacts with the people it will be easier for me to voice their concerns and not to be told what is needed. In most cases the project managers just tell me what to do and not consulting me on the issues affecting the workers. Everything that is done on the project is strictly as specified by the project document and not what is coming from the workers on the ground. We are not involved in the decision-making process. They just instruct you to do what they have already decided. This is a real issue and I try to hide it from the workers so that they do not know that this is what is happening

C *Is it that you have to train workers each time you get a new contract?*

S1 Not exactly, unless there are new workers to be trained. If for example I have four new workers on the team then training has to be done. If it is only one person, no training is done because the trainings are costly.

C. *What other problems do workers encounter when participating in these activities?*

S1 Language is the biggest problem being faced. This is illuminated mostly during training workshops where facilitation is mostly done in English. "Most of my workers cannot speak or write in English which is used by the trainers during workshops; so many of them can not get much information and this affects their performance in the field." It is a challenge. For example the last time we training in chainsaw, the person who conducted only used English as a language of facilitation. As a result many people did not understand exactly what was happening. Luckily, this was a practical demonstration. If it was a theoretical training many people would not have understood a word. But because it was a practical one, people were just observing at what the trainer was doing and later try to do exactly what he had done. They only understood through observations.

The low education level of most of the workers is another issue as many can not read and write and has a negative effect the expected job outputs given to them. The rainy season is also another challenge as the workers do not have the right gear to use.

C *How does the low education level of the workers affect work performance?*

S1 Due to the low level of education, it is so difficult to change some of them (de-frame). They are still in their own ways of thinking and doing things (frames). They mostly like saying 'we have been here long enough and we know how we have been doing things here and so no new information can change the way things are done'. I have problems to make them understand and change things because of my age too. They say I am too young to tell them how to do things because they have around even before I was born. They say a child cannot be our supervisor. This also affects their performance during training workshops.

C *How does the low education level of the people affect performance during training workshops?*

S1 It does as the bigger component of the training programmes is listening. Most of these trainings are conducted in English and so most of them cannot understand English. Even if the facilitator is IsiXhosa, they still use English for facilitation. Mainly because the resource materials used are all in English. It is also had to translate into IsiXhosa and sometimes the meaning may be changed. Because the resource materials such as hand books are in English, they only use pictures for them to understand. Even though the materials were translated into IsiXhosa, people would still have problems with them as they cannot read or write their names.

C *How are these highlighted problems addressed?*

S1 The use of both languages, English and IsiXhosa during the training workshops is helping but they are some technical terms that are not in IsiXhosa. However, by mixing the slow learners with the fast learners, work performance is enhanced.

Sometimes we have to organise another training intervention so that the workers can understand. In addition as a Manager, I rephrase and provide information to the workers what had happened in the training before we start our work activities. I do it for my workers and not for the SPs.

C *What are some of the needs or requirements of the workers in your project?*

S1 The people in this project need training. Training not for the job but that which will make them understand what is going to happen (what is the project all about), who they are, what their preferences are and what is expected of them if they are engaged in the project activities. The trainers should also be of the same age group as the learners (need to categorise people to be trained according to ages). There is also need to look at their historical

and cultural backgrounds in terms of the way certain names have evolved over time. For example, what was wattle called in the past to what it is called now?

C *What are your needs as a Contractor?*

S1 I need training on how to manage the different age groups in my project. Also since I am the one who interacts with the people it will be easy for me to voice their concerns and not to be told what is needed. In most cases the project managers just tell me what to do and not consulting me on the issues affecting the workers. Everything that is done on the project is strictly as specified by the project document and not what is coming from the workers on the ground. We are not involved in the decision-making process. They just instruct you to do what they have already decided. This is a real issue and I try to hide it from the workers so that they do not know that this is what is happening.

C. *What incentives/benefits are in place to foster community participation in WFW activities?*

S1 Employment provision and wages are reasonable based on reasonable work load and the workers are paid on time. Their participation also helps to address some problems faced earlier such as water security by increasing water supply, livestock loss and attack on women and children when drawing water from the Cata River. The restoration of the productive potential of land through removal of black wattle forests and other alien plant species is also an incentive for their participation.

C *What social factors/interactions are sustaining these WRM activities?*

S1 In order to address the social problem caused by the wattle. The thick wattle forests and other IAPs were being used as cover by livestock thieves. Incidences of women and children being raped in these forests as they collected firewood and draw water for their gardens and domestic use was a common feature which is now a thing of the past. The other social factors are poverty and unemployment.

C *Thanks for your time and the valuable information that you have availed to me*

S1 You are welcome Mr Phiri

## Appendix V: Copy of transcribed semi-structured interview with Cata Agricultural Project Supervisor

Date – 28/June/2011

C – Charles (Researcher); S2 – Respondent

- C *What is your position and role in the Cata Agricultural Project?*  
S2 I am the supervisor of the farm and I am in charge of record keeping
- C. *What activities of WRM are people/workers participating in at the Cata Agriculture Project?*  
S2 They do farm weeding; soil conservation practices through field preparations, making furrows for watering the field crops; watering the crops, weeding, spraying and clearing the river debris after a very heavy rainfall.
- C *How are the people/workers employed to participate in these WRM activities?*  
S2 Community members are employed by the Cata Agriculture Project through Cata Communal Property Association (CPA). People seeking employment register their names with credentials at the Cata CPA. The Cata Agriculture Project when in need of any workforce, request through the CPA who provides the names of community members in need of employment. Though employment is based on first come first serve basis, skills of the job seekers are one of the main considerations.
- C *Why are community members participate in these WRM activities?*  
S2 They are a number of reasons for that;  
  - Employment opportunity to the local community is one reason for participation.
  - To contribute to the food security of the area and as a source of cheap protein for their families. *“The irrigation project is the source of food in this community; through this project many people get cheap vegetables which are very affordable and sometimes even free.”*
- C *When did the people start to participate in these WRM activities?*  
S2 People started participating in the farm activities when the agriculture irrigation project started in 2002. However, full operations for vegetable gardening commenced around in 2004.
- C *How do communities/workers learn these WRM activities?*  
S2 Through the following ways;  
  - New workers are trained in their respective jobs such as pesticide control, furrow making by the Farm Manager.
  - Workers both new and old are also trained by consultants hired by the National Development Agency (NDA).
  - Also old workers are paired with new workers to train them in farm activities.
- C *Does the low education level of the workers affect workers performance during training?*  
S2 Yes it does affect farm performance. For example we have many training workshops and the same people keep attending the same courses while others are not. Due to low education they keep being trained but do not understand anything.
- C *How do you address this issue?*  
S2 It is not an easy one. However, we mix those who can read and write with those workers that cannot so that they work together. This is done more especially during spraying. We usually combine those with good education with those with low education. That is the management approach. Sometimes the old workers do not want to attend the training programmes and so we take the young ones to do that and later pair them with the old workers so they can teach them what they had learnt.
- C *What is the relationship among workers in this situation?*

S2 It is very good. The young ones always try to show the old ones what they know and it takes time. We have never experienced any problem and it is working well for us at Cata Irrigation Farm.

C *What other problems do workers encounter in doing WRM activities?*

S2 Flooding caused by heavy rainfall damages water channels/furrows and bridges. Birds in particular the Egyptian Geese eat crop seedlings. For example for every 8000 seedlings planted, 400 (5%) are plucked out by the birds and these have to be replanted. Marketing is also an issue and there not many markets for the produce and mostly the produce are sold locally. Salaries for workers are a big challenge. Salaries for permanent staff are provided by the Expanded Public Works Programme (EPWP) and since March 2011, no salaries have been given yet to workers.

C *How are these problems addressed?*

S2 Workers are being used to address these issues but it is not easy. The Cata Agriculture Project has to request for resources for infrastructural maintenance from the Cata CPA. As for salaries Cata Agriculture Project has to wait for EPWP to release them once they get their allocation from government.

C *What other support do you get in doing your WRM activities?*

S2 The National Development Agency helps with resources for capital investments. For example, they have provided the Cata Agriculture Project with funds to install sprinklers for irrigation. However, the project has stalled due to low electricity voltage at the Cata Agriculture Project farm. Eskom has been approached to upgrade the power supply but are waiting for funds from Cata CPA.

C *What incentives/benefits are in place to foster community participation in WRM activities?*

S2 The farm produce that has not met the markets standards is given freely to community members of Cata. Communities that have livestock are allowed to graze their animals in unplanted fields, especially during winter season when forage is the biggest problem in the area. Other incentives include employment to the locals and development of skills through training offered by hired consultants. To date the farm has employed 26 people who are bonafide members of Cata. A quote from the supervisor *"the money I get from working at the Cata Irrigation Scheme has changed my economic and social condition. I no longer have to rely on my mother to support my family. In my home I have vegetables that we buy cheaply from the farm and our diet has improved."*

C *How do the people/workers share knowledge/information amongst themselves?*

S2 Information is shared through training workshops. The apprenticeship system adopted by management of the Cata Agriculture farm also promotes sharing of information amongst the workers. Management also conduct bi-weekly meetings where information is shared and lessons are learnt

C *How do you share knowledge/information on WRM activities with people in the villages?*

S2 The Cata Agriculture Project Management Committee has monthly meetings with the Cata CPA where information is shared. Annually, a general meeting with communities of Cata organised by the CPA is held where relevant Cata Agriculture Project activities and issues are discussed. Communities are allowed to ask questions on the operations of the farm and any other issues and feedback is provided during meetings. People also leave requests with the CPA which is then passed on to us for consideration.

Sometimes some community members come to the farm and pass on their concerns to us. They sometimes request for certain crops to be planted and we consult our soil specialist and if resources are available we meet the community needs. For example last season we did not grow tomatoes and communities requested for tomatoes to be grown. This season we have planted tomatoes on the farm.

C *What social factors/interactions are sustaining these WRM activities?*

S2 There are a number of factors;

- Poverty is the main driving force that is sustaining the farm operations in the area.
- Lack of employment in the area as a livelihood strategy is another. The Cata Agricultural project the biggest employer in Cata.

- Lack of alternative sources for fresh produce since the community has no enough spaces for cultivating farm produce is another factor.
- The farm is also an opportunity for livestock farmers as additional grazing area for their animals during the winter times.
- The community also view the farm as a skill development springboard to sustain their livelihood.

C *How do communities make use of the project?*

S2 The community make use of the project in several ways.

- As a source of employment and livelihood for the local community.
- As a source of fresh farm produce which is not easily available in Cata.
- It also provides grazing space for local community livestock during needy times such as winter when fodder is scarce.

C *Does the project meet the needs of the communities?*

S2 A bit has been done in terms of employment. There is still room to employ more people but due to lack of funds the farm has been unable to do so. As for the farm produce and provision of animal grazing land, the Cata Agriculture Project is satisfying the community needs.

C *What has the project done to you as a community member of Cata?*

S2 *'It has really changed my life because it has given me skills and I earn money at the month-end'. Through the crops that we plant, it has changed my health because everyday I buy vegetables'.*

C *What are some of the skills it has provided you?*

S2. Through working for Cata Agricultural Project and the trainings that I have acquired as clerk recorder, I have acquired skills in administration, management skills and many others. Just last month I got training in food and hygiene. Even if the project came to a close, I would survive because of the qualifications and experience I have acquired so far. It surely has changed my life.

## Appendix VI: Copy of transcribed semi-structured interview with Water for Food Coordinator

Date: 15/Sept/2011

### C – Charles (Researcher); S4 – Respondent

- C *What is your role in this project that you are involved in?*  
S4 I am a member of the Water for Food group here in Nyanga. But I also assist in coordinating the activities of the group.
- C *What activities of water resources management do you participate in as a project?*  
S4 We are involved in harvesting rainwater for vegetable and fruit growing. We also do garden management (weeding, watering and pest control) and soil conservation (soil fertility improvement through use of organic manure and erosion control).
- C *How do you participate in these water resources management activities?*  
S4 You can only participate by becoming a member of the Water for Food group. It is a group of women who come together to try and improve their livelihoods through gardening. To be member one should also be prepared to contribute financially and work hard to manage the rainwater harvesting infrastructure and the vegetable gardens.
- C *Why are you participating in the Water for Food activities?*  
S4 There are several reasons:-
  - As a source of income so as to sustain our livelihoods through the selling of the garden produce
  - It is a source of protein for our families,
  - It helps address the problems of water shortages that we most experience during the times when rains have stopped.
  - It is a self employment project for the women,
  - It is the simplest way to get food, money, and
  - It also helps to improve the food security and address the issue of poverty in the Cata area, as you know there is poverty in Cata and there are not many jobs around.
- C *How do you learn these water resources management activities?*  
S4 The members of the Water for Food group learned through the following:-
  - Members of the Water for Food group were trained with support from Border Rural Committee and Cata Communal Property Association. The members were trained in Matsepo, Pretoria.
  - The Water for Food groups from Cata meet with groups from other villages such as Middledrift and Alice twice every year through facilitated workshops. The purpose is to exchange information, share lessons, practices and experiences on how they are doing. These exchange workshops are organised by the Department of Agriculture and NGOs.
  - Through formalised meetings members of Cata Water for Food groups meet once every month to share and learn from one another. However, some members usually have adhoc meetings amongst themselves as need arise to share information, knowledge and learn from one another and from friends.
  - Through training programmes organised by the Department of Agriculture and also through requests from the Water for Food groups in Skafu and Nyanga.
- C *Did all the 21 members of Water for Food group receive training?*  
S4 Not all members were trained. Others did not undergo training.
- C *How then did they learn to do the Water for Food activities?*  
S4 They learnt from the group members that received training. One of the trained group members organised a practical demonstration at her homestead garden where all who did not go for training attended the demonstration. This kind of information was passed on to other members. We also passed on to our families at home as they are the ones who actually do the work when we are not at home.
- C *Does the Water for Food conduct refresher courses for its members?*  
S4 Not exactly. Only through organised workshops do people have some sort of refresher courses. For example, every year a workshop is conducted where they meet groups from other areas or villages. During these workshops



they share what they have learnt and know and exchange ideas. They form groups headed by a representatives who will then make a presentation and demonstrate on how to do certain activities including technical aspects of gardening are done.

C *How are things being done after the training workshops?*

S4 There is much progress and performance has improved. For example if I am a member of the group and experiencing difficulties, I request for a meeting where I will raise my issues or problems and those who have experienced them will help in addressing them.

C *How has the training workshops helped the members?*

S4 Training workshops have been very helpful. For example our soils are not rich in nutrients and so by implementing the activities on soil fertility and management that we learn from workshops, it has helped us improve the quality of our soils and this has resulted in improved production of our gardens and produce.

C *Who conducts training in these training workshops?*

S4 They are usually consultants who are hired to do that. Because the consultants are usually not IsiXhosa speakers, they use two languages, English and IsiXhosa. This is done to enable everyone to understand and be on the same level. If English is being used, there is always a translator to translate into IsiXhosa.

C *What problems do you encounter in doing these WRM activities?*

S4 There a number of challenges being faced.

- Some rainwater harvesting and storage infrastructure made of cement have cracked and cannot be utilised.
- Crops are damaged by some insects as well as too much heat
- Our gardens and crops get destroyed through invasions by livestock from the neighbourhood
- Sometimes there is not enough rainfall to be collected that can sustain our gardens for the whole season.
- Members are changed from positions every year and this creates discontinuity and sometimes leads to misplacement of certain information.

C *Who installed the rain harvesting tanks in Cata to the members of the Water for Food group?*

S4 The tanks were installed by Umhlaba Consulting, but were supplied by Border Rural Committee Department of Agriculture and Department of Water Affairs. All the 21 members got the support of the tanks for garden projects.

C *Do the member's use the water harvested using the installed rain harvesting tanks for other purposes other than gardening?*

S4 The tanks that were provided by the Department of Agriculture, Department of Water Affairs and Border Rural Committee and installed by Umhlaba Consulting are strictly for homestead gardens. Water for other domestic purposes must be from other sources such as municipality taps or each homestead should install its own water tank for other purposes. However, we have people who sometimes use the water from the garden tanks for other purposes, but that is not allowed and we discourage that habit from our members.

C *Why has the number of members just remained at 21 for such a long time?*

S4 Before the supply of the water tanks we had more members. However, most of them dropped off along the way because they could not cope with work involved. Only 21 members remained and they are the ones that benefited from the supply of the tanks. Though they are only 21 members in the group, other community members have replicated the practice and they are doing it in their homesteads but they do not have the water tanks. They draw water from the taps and river.

C *Before installation of the tanks, what were people using and when were they installed?*

S4 Before tanks were installed it was very difficult because we also did not have water from the taps. People used to collect water from the river which was not easy. Sometimes people would collect in drums when rain falls. The cement water tanks were the first ones and were installed between 2003/2004. The plastic tanks were later installed in 2009.

C *How do you address these problems?*

S4 With regards to water issues, we have to collect additional water from the Cata River and other water sources such as the communal taps. As for repairing of the water infrastructure, that's a challenge because Border Rural Committee can not support all the group members anymore and so we have to fend for ourselves. For insects we use chemical to kill crop eating insects.

Sometimes we go to the Department of Agriculture (DA) to ask for help and they do assist us. The DA would send extension officers who come to help address technical issues being faced. We get extensional support and they teach us on how to manage our vegetables, how to improve on soil fertility and any other that we may having problems with. We discourage use of chemicals because as a group we promote usage of organic manure.

C *What support/benefit do you get from other existing rainwater harvesting homesteads?*

S4 Members support each other in sourcing seedlings, information and learn from each other.

C *How do you share knowledge/information with other rainwater harvesting homesteads?*

S4 It is done through formalised meetings members of Cata Water for Food groups meet once every month to share and learn from one another. Adhoc meetings are also held with other members as need arise to share information, practices, and experiences and learn from one another.

C. *How do the members of the group share knowledge with other members of Cata?*

S1 There is usually an AGM organised by the Cata Communal Property Association were we meet with the Cata community to give an update on how we are doing as a group. For 2011, we already had an Annual General Meeting in August at the Cata hall.

C *How do you assess the performance of the members?*

S4 It is not easy especially this time that we are trying to do things on our own. We have a performance monitoring form that each member fills in for example each time when one receives seedlings, how many have germinated after planting and so on. But not many use it because they cannot read or write as it is English.

C *What other support do you get in doing your water resource management activities?*

S4 Through sharing information and learning from friends. Border Rural Committee and the Department of Agriculture help us in sourcing seedlings and providing the water tanks as well as providing extension services.

C *What social factors/interactions are sustaining these WRM activities?*

S4 Several factors are at play

- Unemployment is high in the area and so this is a source of employment to sustain our livelihoods
- To address the issue of food insecurity in the area
- The problem of water in our area,
- Through the interactions with other community members involved in the practice
- As a source for skills training and development

C *Who is in charge of the piped water in Cata?*

S4 The Municipality is in charge and they do maintenance works for major works. However, the community members also help when it is a small problem. The people that help are those that did the training at the time they were installing the water pipes and they do it on a voluntary basis.

C *Thank you for your time and information provided*

S4 You are most welcome.

## **Appendix VII: Interview questions for focus group discussions**

- Q1. What activities of Water Resource Management (WRM) do you participate in as Water for Food group?
- Q2. How do you participate in these activities?
- Q3. Why are you participating in these WRM activities?
- Q4. When did you start to participate in these activities?
- Q5. How many people are involved in the Water for Food group?
- Q6. How do you learn to do these WRM activities?
- Q7. What problems do you encounter in doing these WRM activities?
- Q8. How do you address these problems?
- Q9. What support/benefit do you get from other members of the group?
- Q10. How do you share information with other group members?
- Q11. What external support do you get as Water for Food group?
- Q12. What social interactions are sustaining the group and its activities?

**Appendix VIII: Summary of observations conducted in the study (FO)**

<b>Site</b>	<b>What was observed</b>	<b>Date &amp; Duration (hours)</b>
Water for Food homestead gardens	I observed a woman (mother) giving guidance to her son how to draw water from the storage tank and water the plants when I visited one of the homestead gardens. This way knowledge was being transferred to the son from her mother on the watering practice of vegetables from water collected through rainwater harvesting method	30 <sup>th</sup> June 2011 (15 minutes)
	I observed that one of the homestead vegetable gardener has developed and adapted to another strategy of drawing water from a nearby stream because her rainwater harvesting storage tank is cracked and leaking and cannot hold water for long. The woman has resorted to drawing water from a nearby stream so as to continue watering her vegetable garden.	30 <sup>th</sup> June 2011 (10 minutes)
	I observed that community members congregate in a social gathering such as (meeting). Community members were sharing information on issues or problems affecting them such as pests in their vegetable gardens (see Figure 4.3)	30 <sup>th</sup> June 2011 (10 minutes)
	I also noticed that the age group of the members in these structures also varied. For example most of the members of the Water for Food group are mostly old women. The only member of the group I met who is a young woman is the one who helps with coordination of the group (see Figures 4.0 & 4.3)	30 <sup>th</sup> June 2011 (10 minutes)
	I observed a member of the Water for Food group preparing a trench bed for planting spinach at one of the homesteads. She was adding compost material and soil to the vegetable bed. What was interesting is that she was doing these activities with the help of her brother and two of her sons (see Figure 4.4)	30 <sup>th</sup> June 2011 (10 minutes)
	Learning by doing. Some community members were trying other ways of doing things than what has been taught to them. This included trying new varieties of vegetables and learning through doing it themselves (see Figure 4.5)	30 <sup>th</sup> June 2011 (15 minutes)
	I also was noticed that people have gained knowledge and skills through trainings, engagement with the practices and other learning interactions. These skills include gardening, rainwater harvesting, improvement of soil fertility through use of organic materials which were witnessed through the practices being implemented at various homestead gardens (see Figure 4.0, 4.4 & 4.5)	30 <sup>th</sup> June 2011 (10 minutes)
Cata Agricultural Project	I observed worker applying fertiliser to a crop of cabbages whilst other workers were spraying other crops. I also observed the Farm Manager giving instructions to a tractor driver on how to make furrows with a tractor plough for irrigation (see Figures 4.2, 4.6 & 4.10).	4 <sup>th</sup> July 2011 (30 minutes)
	I saw workers working along the Cata River clearing the debris that had clogged the river impeding the easy flow of water to their irrigation furrows	4 <sup>th</sup> July 2011 (5 minutes)
	I noticed community livestock (sheep, goats, cattle & horses) grazing in unplanted fields of the Agricultural Project farm	4 <sup>th</sup> July 2011 (15 minutes)
Cata Village homesteads	Through observations, I experienced signs of the effects of betterment in the way the village settlements are organised. People are confined within their small residential plots that they occupy together with livestock. They do not have even land for agriculture and are forced to cultivate in the small residential plots that	4 <sup>th</sup> July 2011 (40 minutes)

	they occupy while others do not even have spaces for gardening.	
Working for Water Project	I observed that in the workers were in groups. Old and experienced workers were grouped with new workers. However, I noticed that the young ones where among their age groups and women where grouped with fellow women.	6 <sup>th</sup> July 2011 (1 hour)
	I observed workers using chainsaws to do the spacing in the wattle forest plantations whilst other workers were observing. This was part of forest plantation management for the local community. Other workers were trimming the off-shoots from the main wattle branches and applying chemicals so that only the main branch grows up as these are meant for sale to timber loggers	
	Through observations, I also noticed that most resource materials (manuals, assessment form) provided by Service Providers to members of the communities of practice after training workshops were all written in English. As most of community members have cannot read or write in English, this can have an effect on participation. Since the resource materials (Chainsaw training manual) are all written in English, workers were relying on those who could read to help them understand what was being said. Otherwise most of them were being helped by picture illustrations in the manual	
	I also noticed on my way back from the Working for Water project site that community members under the Working for Water project had cleared all invasive alien plants from agriculture and grazing lands so as to restore the reproductive potential of the land and improve water availability. This was evident in drainage areas.	6 <sup>th</sup> July 2011 (10 minutes)

## Appendix IX: Letter for seeking authority

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Dear Sir/Madam,

Reference:        Permission to conduct an interview for academic purposes

I am male student pursuing a Masters degree of Education (Environmental Education) at Rhodes University in Grahamstown. As part of the programme, I am preparing a half thesis on "*how communities learn through participating in Integrated Water Resource Management (IWRM) practices*" in Cata village in the Amathlathi municipality of the Keiskammahoek Magisterial District.

I am therefore, seeking your permission for an interview with an officer from your organisation for the stated purpose.

I am enclosing for your information a copy of my letter of introduction from the university. I undertake to use the information I will collect for the purpose stated in this letter. Ethical issues such as confidentiality, right to privacy, and honesty will be maintained. If the institution is willing to participate in the interview please sign the letter in the space provided below.

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

Thanking you in anticipation of your favourable response.

Yours sincerely,

Charles M. Phiri  
Masters Student  
Environmental Learning Research Centre  
Rhodes University, Grahamstown

## **Appendix X - Letter of introduction**

17 June 2011

To whom it may concern,

This letter serves as confirmation that Mr. Charles Phiri (student number 611P6214) is a full-time student within the M ED Environmental Education programme at the Environmental Learning Research Centre, Rhodes University, Grahamstown. This is a two year course running from 2011 – 2012.

Mr Phiri's study is 'An investigation of how communities learn through participating in Integrated Water Resource Management practices'. The research is a case study on communities in Cata village in the Amathlathi municipality of the Keiskammahoek Magisterial District in Eastern Cape, South Africa.

The study is in partial fulfilment of a half thesis in a Masters Degree Programme at Rhodes University, Environmental Education.

Should you require any further information, please don't hesitate to contact me.

Yours sincerely,

Sashay Armstrong  
Research Programme Administrator  
Environmental Learning Research Centre  
Education Department  
Rhodes University  
Grahamstown  
[Sashay.armstrong@ru.ac.za](mailto:Sashay.armstrong@ru.ac.za)  
046 603 8390

## Appendix XI: Summary of main issues emerging from the 3 selected communities of practices

Table 1: Summary of the main issues emerging from the interviews, focus group discussions and observations of communities of practices: **(How and what communities are learning)**

Category	Response	Respondents
Facilitated training interventions	<ul style="list-style-type: none"> <li>Some members of the Water for Food (WfF) group underwent a training programme at Matsepo in Pretoria</li> <li>People learn through training workshops facilitated by Service Providers</li> <li>External groups came and facilitated a training programme for Water for Food members</li> </ul>	S4, FG1:1  S1, S2  S4
Exchange visits and tours	<ul style="list-style-type: none"> <li>WfF members of Cata undertake field visits and tours to meet other groups from other areas</li> </ul>	S4, FG1:4
Meetings, social interactions and conversations	<ul style="list-style-type: none"> <li>WfF members have formalized meetings at Cata hall once per month. Sometimes they conduct informal meetings.</li> <li>The irrigation scheme conduct bi-weekly meetings with workers where information and lessons are shared amongst workers and management</li> <li>Working for Water (WfW) project debriefs its workers regularly before start of work activities</li> </ul>	S4, FG2:3, FO  S2, S3  S1
Intergenerational knowledge transfer	<ul style="list-style-type: none"> <li>WfF members pass on information to family members and others said they learnt gardening from parents</li> <li>Others share and pass on information through stories to young ones</li> </ul>	S4, FG2:2, FO  K2
Learning through observations	<ul style="list-style-type: none"> <li>Trained Water for Food members organized a practical demonstration for members that were not trained</li> <li>Through observations of how activities are done at other homesteads and then replicate them at our homes</li> <li>Through observing trainers or facilitators what they are doing and later doing exactly what we had observed</li> </ul>	S4, FG1:1  FG1:1  S1
Learning from others (apprenticeship process)	<ul style="list-style-type: none"> <li>Learning takes place through the apprenticeship approach - learning from others. This is mainly done for slow learners and/ or new workers who are paired with old and experienced learners so that they learn from their colleagues</li> <li>At Cata farm we mix workers who can read and write with those workers that cannot so they work together. This is done more especially during spraying. We usually combine those with good education with those with low education</li> </ul>	S1        S2
Learning through printed text and literature	<ul style="list-style-type: none"> <li>DWA disseminates information to schools &amp; learners in the WfW project areas through its 2020 project in form of brochures</li> <li>One member of the Water for Food group said she learnt about how to control pests and erosion in her garden from the pamphlets and posters at the Cata hall</li> </ul>	K4   FG2:1
Extensional workers facilitate learning	<ul style="list-style-type: none"> <li>The Department of Agriculture &amp; other developmental NGOs provide extensional support services to us when we request for them. "The DA would send extension officers who come to help address technical issues that we sometimes face"</li> <li>"We do get support from the agriculturalists (abalimi). When we request them, they do come and look around to see how we are progressing"</li> </ul>	S4       FG1:3
Learning through the practice	<ul style="list-style-type: none"> <li>Through on-field undertaking of work activities</li> <li>Through participating in WfW project community members have learnt how to do to control the black wattle and other invasive alien plants.</li> </ul>	S3, S4  S1, FO



Knowledge learnt	<ul style="list-style-type: none"> <li>We are given skills in rainwater harvesting, soil fertility improvement, soil conservation practices, erosion control, gardening and management</li> <li>We have learnt on chainsaw management, herbicide application, river bank management, methods of water treatment and storage. Other information included identification and control of invasive alien plants species, forestry management, environmental awareness, health education and occupational skills.</li> </ul>	S4, FG1:1, FG2:3  S1, S2, S3, K4
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Table 2: Summary of the main issues emerging from the interviews, focus group discussions and observations of communities of practices: **(Contextual factors influencing participation and learning)**

Category	Response	Respondents
Use of English language during facilitated trainings	<ul style="list-style-type: none"> <li>Use of English as mode of facilitation hampers participation as most workers cannot read and write in English</li> </ul>	S1, S4
Power relations	<ul style="list-style-type: none"> <li>Novice learners seem to get discouraged while others withdraw from certain activities because the old timers become too harsh on them each time they ask to be helped</li> <li>Some Service Providers come up with their own training different from the one requested by community members</li> </ul>	S1, K3
Low education levels	<ul style="list-style-type: none"> <li>Low education level of most workers has a negative effect on participation, performance and expected output</li> <li>Learning is affected as most of them cannot understand much as the biggest component of the training programmes is listening</li> <li>The low education level impacts negatively on the farm performance as most workers cannot read or write</li> </ul>	S1  S1 S3
Resource materials not contextualised	<ul style="list-style-type: none"> <li>Since resource materials are all in English language, workers and cannot use them as they cannot understand them</li> <li>Nearly all members of the WfF do not use the assessment form to monitor progress because they cannot read or write as the form is in English</li> </ul>	S1  S4
Policy Frameworks	<ul style="list-style-type: none"> <li>Betterment planning had an effect on people's socio-economic status which influenced their quality of life and involvement in communities of practices</li> <li>National Policy Framework on Public Participation has provided strategies and provisions for public participation in WRM in their localised areas</li> </ul>	K1, K2  K4
Poverty	<ul style="list-style-type: none"> <li>People participate to address the high poverty levels prevalent in the area</li> <li>Poverty is of the drivers for sustaining the farm operations in the area</li> </ul>	S4  S2, S3

Table 3: Summary of the main issues emerging from the interviews, focus group discussions and observations of communities of practices: **(Reasons for community participation)**

Category	Response	Respondents
Source of livelihood	<ul style="list-style-type: none"> <li>Community members participate in the WfF group as a source of income to support livelihoods through the selling of the garden produce</li> <li>It is the easiest way to obtain food</li> <li>To enhance food security of the area and address poverty</li> <li>Communities are involved in the gardening activities so they can obtain protein for the families</li> </ul>	<p>S4</p> <p>S2 S1, S3</p> <p>S4</p>
Skills development	<ul style="list-style-type: none"> <li>Community members also participate in these water management platforms as sources for skills training and development</li> </ul>	S1, S2, S3, S4
Employment opportunity	<ul style="list-style-type: none"> <li>It is a source of employment opportunity for most locals in the area</li> </ul>	S1, S2, K4
Restoration of the potential of the land	<ul style="list-style-type: none"> <li>They participate to restore the productive potential of the land through removal of the black wattle forests and other Invasive Alien Plant species and replanting the area with indigenous plant species</li> </ul>	S1, S2
Water availability and supply	<ul style="list-style-type: none"> <li>Communities participate in the Working for Water activities in order to enhance water security in the area by increasing water supply and availability through Invasive Alien Plant removal. Alien plants invade spaces for indigenous plants and they take up a lot of water</li> </ul>	S1, K4
Socio-ecological issues and risks	<ul style="list-style-type: none"> <li>To address socio-ecological issues of invasive alien plants</li> <li>The thick wattle forests and other invasive plants were being used as cover by livestock thieves.</li> <li>They were cases of women and children being raped in these forests as they collected firewood and water</li> </ul>	S1, S2
Incentives offered by the Cata Agriculture Project	<ul style="list-style-type: none"> <li>Farm produce that has not met the market standards is given at very affordable prices and sometimes even freely to community members of Cata.</li> <li>Community members that have livestock are also allowed to graze their animals in unplanted fields.</li> </ul>	S2, S3

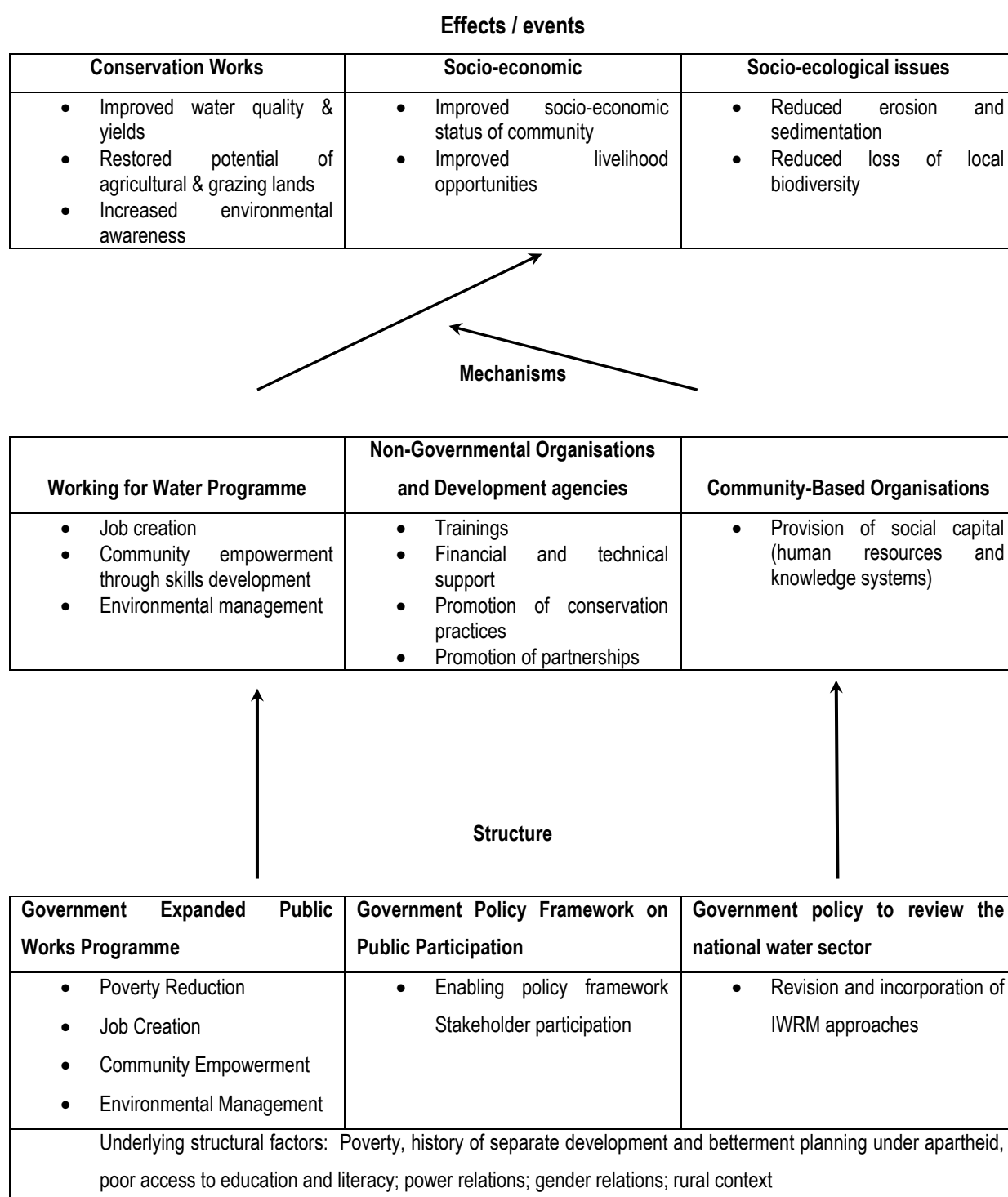
Table 4: Summary of the main issues emerging from the interviews, focus group discussions and observations of communities of practices: **(Community concerns)**

Category	Response	Respondents
Prior Knowledge on initiated projects	<ul style="list-style-type: none"> <li>Prior knowledge on projects being implemented in the area or their locality is not availed to local communities. "The people in this project need training. Training not for the job but that which will make them understand what is going to happen before a project is implemented, what is the project all about, who they are in the project, what their preferences are and what is expected of them if they are engaged in the project activities"</li> </ul>	S1
Involvement in decision-making processes	<ul style="list-style-type: none"> <li>The community members are not consulted on the kind of services required such as training interventions to be offered and decisions are just imposed on them</li> </ul>	S1
Training not specific to community needs	<ul style="list-style-type: none"> <li>Training provided to community sometimes is not specific and does not address the needs of the intended beneficiaries. Although information is passed on to service providers on the kind of training</li> </ul>	S1

	intervention needed by the project implementers on the ground, at times different training is imposed on them as the service provider feels.	
Use of English during facilitated trainings	<ul style="list-style-type: none"> <li>The use of English during facilitated training programmes does not always work, as not everyone understands what was being said or talked about. It hampers participation as most workers cannot read and write in English and inhibits understanding and is a barrier to participation</li> <li>Because the resource materials such as hand books are in English, people only use pictures for them to understand.</li> </ul>	S2  S1
Resource materials not locally contextualised	<ul style="list-style-type: none"> <li>The resource materials are all in English language and workers cannot use them as they cannot understand them</li> </ul>	S2, S3
Non valuing of local community knowledge	<ul style="list-style-type: none"> <li>community members as they feel their historical and cultural knowledge around the water resource management practices is not appreciated</li> </ul>	S1

## Appendix XII: Open system maps for selected communities of practice

### Working for Water community of practice



## Water for Food community of practice

### Effects / events

Conservation Works	Socio-economic	Socio-ecological issues
<ul style="list-style-type: none"> <li>Improved water quality &amp; yields through rainwater harvesting</li> <li>Improvement in soil fertility</li> <li>Increased environmental awareness and management</li> </ul>	<ul style="list-style-type: none"> <li>Improved socio-economic status of community</li> <li>Improved livelihood opportunities</li> <li>Enhanced food security</li> <li>Improved nutritional status</li> <li>Sustainable home food production practices</li> </ul>	<ul style="list-style-type: none"> <li>Reduced poverty and hunger in the area</li> <li>Reduced malnutrition and other food deficiency related diseases</li> </ul>

### Mechanisms

Water for Food Movement	Non-Governmental Organisations and Development agencies	Community-Based Organisations
<ul style="list-style-type: none"> <li>Job creation</li> <li>Women empowerment through skills development</li> <li>Rainwater harvesting</li> </ul>	<ul style="list-style-type: none"> <li>Trainings</li> <li>Financial and technical support</li> <li>Promotion of conservation practices</li> </ul>	<ul style="list-style-type: none"> <li>Provision of social capital (human resources and knowledge systems)</li> </ul>

### Structure

Government Expanded Public Works Programme	Government Policy Framework on Public Participation	Government policy to review the national water sector
<ul style="list-style-type: none"> <li>Poverty Reduction</li> <li>Job Creation</li> <li>Women Empowerment</li> <li>Environmental Management</li> </ul>	<ul style="list-style-type: none"> <li>Enabling policy framework</li> <li>Stakeholder participation</li> </ul>	<ul style="list-style-type: none"> <li>Revision and incorporation of IWRM approaches</li> </ul>
Underlying structural factors: Poverty, history of separate development and betterment planning under apartheid, poor access to education and literacy; power relations; gender relations; rural context		

## Cata Agricultural Project community of practice

### Effects / events

Conservation Works	Socio-economic	Socio-ecological issues
<ul style="list-style-type: none"> <li>Improved water quality &amp; yields in the Cata River</li> <li>Increased environmental awareness</li> </ul>	<ul style="list-style-type: none"> <li>Improved socio-economic status of community</li> <li>Improved livelihood opportunities</li> <li>Enhanced food security of the area</li> <li>Availability of cheap vegetables</li> </ul>	<ul style="list-style-type: none"> <li>Reduced erosion and sedimentation in the Cata River</li> <li>Reduced hunger and poverty</li> </ul>

### Mechanisms

Community Publics Works Programme	Non-Governmental Organisations and Development agencies	Community-Based Organisations
<ul style="list-style-type: none"> <li>Job creation</li> <li>Community empowerment through skills development</li> <li>Environmental management</li> </ul>	<ul style="list-style-type: none"> <li>Trainings</li> <li>Financial and technical support</li> <li>Promotion of conservation practices</li> </ul>	<ul style="list-style-type: none"> <li>Provision of social capital (human resources and knowledge systems)</li> </ul>

### Structure

Government Expanded Public Works Programme	Government Policy Framework on Public Participation	Government policy to review the national water sector
<ul style="list-style-type: none"> <li>Poverty Reduction</li> <li>Job Creation</li> <li>Community Empowerment</li> <li>Environmental Management</li> </ul>	<ul style="list-style-type: none"> <li>Enabling policy framework Stakeholder participation</li> </ul>	<ul style="list-style-type: none"> <li>Revision and incorporation of IWRM approaches</li> </ul>
Underlying structural factors: Poverty, history of separate development and betterment planning under apartheid, poor access to education and literacy; power relations; gender relations; rural context		