

**UNIVERSITY OF ZIMBABWE
DEPARTMENT OF CIVIL ENGINEERING
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**AN ASSESSMENT OF TRADITIONAL WATER MANAGEMENT PRACTICES
AND THEIR IMPLICATIONS FOR IMPROVED WATER GOVERNANCE IN
THE LIMPOPO BASIN: A CASE OF THE SIBASA DAM IN MZINGWANE
CATCHMENT, ZIMBABWE.**

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DECLARATION

I, Twikirize Doris, declare that this thesis is my own work, a result of my own investigation. All the sources that I have used or quoted have been indicated and acknowledged by means of complete references. To the best of my knowledge, this work has not been submitted before for any other degree at any other university.

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Date

ABSTRACT

Current water reforms in most southern African countries focus on decentralizing water management to the water users, as a way of improving water governance. The target of these reforms is equity, efficiency and sustainability – all catchphrases in current global water governance. Unfortunately the reforms tend to concentrate on the use of statutory laws, and give little consideration to the potential of already existing traditional practices. This is despite the fact that traditional water managements have been in existence even before the introduction of the modern methods and have stood the test of time. In rural Africa, traditional practices, often informed on different ethnic groups, play an important part in natural resource management. Water resource management is no exception. This report presents the findings of a case that examined traditional water management practices around Sibasa Dam located in the Mzingwane catchment, which forms part of the Limpopo Basin in Zimbabwe. This is a semi-arid region receiving 250 – 550 mm of rainfall per annum. The study examined water-related management activities around Sibasa Dam, which is a small multipurpose dam. It is one of the many small dams found in the Basin that supply domestic water and is also used for livestock watering. Sibasa dam is unique in that it is fed by base flow. It has survived major droughts in the area and significantly, has not silted up in its more than 30 years of existence. Key informants and structured questionnaires administered at household level were used to assess traditional water management practices, in terms of their existence and their effectiveness for sustaining the rural livelihoods. Their implications for IWRM, and therefore improved water governance, were also assessed. The study revealed that customary laws governed water resources management. Traditional leaders presided over all water-related issues. They were responsible for setting up the rules governing the water resources; demarcating specific areas around the water sources, handling of offenders and management of conflicts. Sometimes they carried out these roles together with the community. The traditional water management practices were found to be quite effective for sustaining food production, because everyone is allowed to access as much water as they need. It was also found that water resources were managed as a whole system; during the rain season people used water from other sources, while reserving the Sibasa dam for the dry season. The majority of the people were not aware of the IWRM-driven structures, such as Catchment Councils, Sub-catchment Councils and ZINWA, indicating that attempts to introduce IWRM in this region have not been effective. The report concludes that it is important to seriously take into account traditional water management practices, as these are vital for improved water governance. However, it is vital to first assess the sustainability of such traditional water management practices for effective IWRM, and therefore improved water governance.

DEDICATION

I dedicate this thesis to the memory of my Parents Elly and Peace Muhairwe, who taught me to always work hard, and to strive for the best.

And also to my sisters; may this work inspire you to reach for greater zeniths in your academics.

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ACRONYMS

AREX	-Agricultural Research Extension
CC	-Catchment Council
DDF	-District Development Fund
FAO	-Food and Agriculture Organisation
GWP	-Global Water Partnership
IIKSS	-Integration of Indigenous Knowledge Systems and Science
ISW	-International Secretariat for Water
IWRM	-Integrated Water Resources Management
SADC	-Southern African Development Community
SCC	-Sub Catchment Council
SPSS	-Statistical Package for Social Sciences
TWM	-Traditional Water Management
UNDP	-United Nations Development Programme
ZINWA	-Zimbabwe National Water Authority

CHAPTER 1: INTRODUCTION

1.1 Introduction

This chapter gives the broad idea of this thesis and its motivation. It begins by presenting the general focus of the study, which gives the background the study. It articulates the main research problem that drives this investigation and the rationale of the study. It gives the research questions and the objectives of this study, as well as the research questions used in the research. Next is a presentation of the major terms used in the study. Last to be presented is the outline of this report.

1.2 General Focus of the Study

Since the early 1990s, water reforms have been and continue to be undertaken in many African countries, including Zimbabwe. The reforms are mainly based on the new paradigm called integrated water resource management (IWRM), among other things. IWRM is defined as a process that promotes the coordinated development and management of water, land and related resources, in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems (GWP-TAC, 2000). The water reforms are aimed at decentralizing water management from the central government to new institutions made up of water users, and in Zimbabwe, this has been done in the form of catchment councils (CCs) and sub-catchment councils (SCCs).

While governance remains one of the core issue in IWRM, with many rich as well as developing countries struggling to find institutional mechanisms for its effective implementation, the biggest challenge for the reforms in which IWRM features prominently is to find practical relevance. In the Zimbabwean context at the present moment, this relates to poverty reduction. Poor water management has been identified as threatening many livelihoods particularly agriculture-dependent rural livelihoods (van der Hoeck, 2001). The question is how can the water reforms contribute to productive water

use in rural communities, which is seen as critical to improved livelihoods? The failure of technocratic approaches to solve this long-standing problem has led to calls for improving water governance as one of the critical issues that needs to be addressed. Indeed the water crisis in the world has been said to be one of poor water governance (Toepfer, 2004). Unfortunately another problem seems to have been created; there is little knowledge of how to achieve effective water governance. This observation applies to Zimbabwe despite six years of water reform, which included institutionalising stakeholder participation as a proxy for effective water governance.

The challenge is made all the more relevant given that already there have been claims that current water reforms are failing to meet the expected efficiency and sustainability of water resources (Katerere and van der Zaag, 2004). For example, there is still limited productive water use by smallholder farmers. This is despite the specific incorporation of principles into national law that are intended to promote social equity and support-increased opportunity for poor people (Katerere and van der Zaag, 2004). Literature suggests that at the crux of this is the failure to develop appropriate governance regimes that can address the full complexity at the user level (Murombedzi, 2001; Campbell *et al.*, 2001). Although improving water governance practices has been one of the foci of the water sector reforms it seems that very little attention has been given to the potential of traditional practices in effective water resources management.

The challenge is also related to the scale issue; the newly introduced institutional framework in Zimbabwe, namely CCs and SCCs, do not take account of the local dynamics/situation (see Merrey *et al.*, 2003, Lovell *et al.*, 2002). The areas falling under the control of these tend to be too big to address water issues at the local level where livelihood strategies are undertaken. As Merrey *et al.*, (2003) point out, the hydrologic units, such as river basins or aquifers, are not always the most appropriate unit for analysis or management. The key is to define boundaries that enable effective action in relation to target groups. While it is conceded that the application of IWRM to the basin level in a decentralized format might represent progress as compared to earlier days of

centralized water management, another problem is that there are few practical examples to follow.

There is also the added danger that despite the new rhetoric, farmers' perspectives are poorly conceptualized and operationalised not least because of the application of uniform rules of operation to different operational realities. This is despite the fact that in Africa, different stakeholders often have varying traditional practices. In fact the contradiction is that while IWRM extols decentralised water management in theory it tends to undermine this very principle in practice because of its centralised data and information and planning requirements. For example, catchment plans tend to undermine or down play local practices as it imposes a 'blanket' plan for the whole catchment, irrespective of the variability of the stakeholders in terms of the water management practices.

The point being made is not that IWRM is not a good approach to water resources management, it is the implementation of its principles that is easier said than done. As it is currently understood, at least in Southern Africa, IWRM is about doing everything at once in an integrated and complex manner. While the principle of integration is generally accepted, as is the idea of catchments, what is less apparent is how these principles can be put into practice (Butterworth and Soussan, 2001). For example, while the principle of stakeholder participation is an excellent one, the problem is that the government tends to dictate how the stakeholders should participate. This tendency often complicates, neutralizes, and/or negates the little gains made towards genuine stakeholder-driven participation.

The foregoing account is true in the Limpopo Basin as for the rest of the country. The challenges are greater in the Limpopo Basin because of the prevailing harsh climatic conditions characterized by low rainfall and high temperatures. This means conventional approaches to providing productive water, for example through dam building and construction of smallholder irrigation schemes may not deliver the much-needed solution. The fact that the majority of people in the Basin are deemed to derive their livelihood from agriculture makes the challenge of ensuring food security and poverty reduction, the

acid test for the reforms. The Basin is also home to various ethnic groups, and these may vary in their identities, livelihood strategies, values and practices. How IWRM takes account such issues is a question that needs to be answered.

1.3 Problem Statement

The current water reforms in most southern African countries focus on the use of statutory legal systems to regulate the use of water resources (Maganga *et al.*, 2003). These are largely based on modern legal systems, an alien conception of law in practically all the countries. The goals of these reforms are equity, efficiency and sustainability – all buzzwords in current global water governance (Swatuk, 2004). It is no wonder that the reforms have given insufficient consideration to the potential of traditional water governance systems, especially in poor rural areas, where diverse customary laws are often more important than statutory law. Moreover these are relied upon in the management and developing access to natural resources (Latham and Chikozho, 2004; Derman and Hellum, 2003, 2004). As Mujwahuzi (2002) points out, there are cases where local communities successfully manage their water resources based on indigenous wisdom.

Post-reform research carried out by different researchers indicates that the situation has not changed on the ground for the rural communities (Dube and Swatuk 2002). The pilot phase implementation of the new water policy in the various regional countries has revealed that although the legal and institutional frameworks have been put in place, the implementation of the IWRM approach has tended to be problematic (Latham, 2001; GTZ, 2000; Leestemaker, 2000; Savenije & van der Zaag, 2000; Sithole, B., 2000). Besides, there are tensions between the modern and traditional laws usually referred to as informal systems. Indigenous practices and systems have been cited as promising to be effective in sustaining rural livelihoods, mainly because they appear resilient in the areas of natural resources management, like water. The fact that the Mzingwane catchment is an arid area, yet these rural people have been able to survive on these limited resources even before implementation of IWRM, suggests the possibility of the existence of strong

sustainable management practices. The issue then becomes whether the indigenous systems exist and to what extent these indigenous systems can and may be incorporated in the new management regimes, and with what impact.

1.4 Rationale

Various water stakeholders in the Mzingwane catchment in the Limpopo Basin derive their livelihoods from agriculture, all of which are water dependent to varying degrees. It can be expected that these various groups have different perceptions and appreciation of water and its value towards improving their livelihoods, which incorporate some elements of traditional experiences. These traditional practices are often informed by ethnicity and therefore tend to vary across different ethnic groups. The examination of ethnicity as an important variable in traditional water management systems is relevant, because ethnicity in Africa is a strong and durable social organizing structure. Perhaps it is one of the remaining indigenous institutions. It is important to state that the negative connotations of the word has not diminished the fact that social organization in Africa, which extends to resources management like water management (see Maganga *et al.*, 2003, Latham and Chikozho, 2004) is a very relevant issue.

In addition, traditional water management practices have been in existence for a long time. They appear to be sustainable in terms of providing food security, and safeguarding the resource. Therefore, for effective water governance, it is essential that an evaluation and appreciation of the traditional practices is undertaken. It is also important that these traditional practices be appreciated and built upon with the so-called modern water management practices. It can be argued that improving livelihoods is likely not to be attained if people are first stripped of their indigenous water management practices and values, and new ones are imposed on them. For example in the African society, women play a great role in the handling and management of water. However, in the current modern set-up, their representation and active participation is not currently effective at the catchment level (Sithole, B., 2001). This is despite the 3rd Dublin principle that advocated for involvement of women in water resources management.

This research was informed by a concern for indigenous practices not getting sufficient attention in the new management regimes based upon the IWRM paradigm. The potential of IWRM paradigm to positively impact the vulnerable rural livelihoods, which rely on traditional-based systems to regulate such as use of water resources, manage water-related conflicts, efficacy and effectiveness of locally defined traditional rights and local mechanisms for adjudication and water administration, has not been tested. This research may result in the appreciation of traditional water resources management practices. This will among other things result in the better operationalisation of rethinking of the IWRM paradigm. For example the resultant improved water governance may lead to increased food security and reduced poverty thereby improving rural livelihoods.

1.5 Research Questions

The main research question of the study was: what are the traditional water management practices existing in the Mzingwane catchment and what are their implications for improved water governance as a key towards increased food security and improved livelihoods?

The specific research questions of the study were formulated as follows:

- What are the various water-related livelihood strategies of the various rural stakeholders in the catchment?
- What are the traditional water management practices at the local level?
- How is the role of traditional leaders recognised within these traditional water management practices? What traditional leaders are involved?
- Traditionally what is the role of women and youth in water resources management practices?
- What are the impacts on food security, income generation and access to productive and safe domestic water for different household members that can be attributed to traditional water management practices?

- Have there been any traditional water management practices incorporated in the modern water management practices and vice versa? If so, have they survived or evolved?
- How have traditional water management practices and the introduction of modern water resources management, impacted on the physical resources base in terms of environmental sustainability?

1.6 Research Objectives

The major objective of the study was to assess the traditional water management practices among the different rural stakeholders in the Mzingwane catchment and their implications into IWRM for improved water governance, and also increased food security and improved livelihoods.

The specific objectives were to:

- identify and examine the existing traditional water management practices among the different rural stakeholders
- assess to what extent these traditional water management practices are effective in ensuring food security and improving livelihoods
- identify and analyse any implications of these traditional practices in the new formal legislative frameworks of IWRM
- analyse the effects of the modern water management practices on the traditional practices.

1.7 Definition of Key Concepts

Most of the concepts that form the basis of this study have varying definitions according to the context in which they are being used. It is therefore important to explain these key words in the context of this study. These key words include: traditional management practices, integrated water resources management (IWRM), water governance, livelihoods, and food security.

1.7.1 Traditional water management (TWM)

A traditional practice refers to a practice originating and occurring naturally in an area or environment. “*Traditional*” or “*indigenous*” management practices are also described as “*customary*” management practices or models of governance (Katerere and van der Zaag, 2004). These are patterns or thoughts of action that have been inherited, that have been handed down as standard and authoritative from previous generations. According to Katerere and van der Zaag (2004), *a custom or tradition is a “norm that has been practiced over a long period and is reasonable and certain”*. Such customary models of water management include chieftaincy; jurisdiction over natural resources; rules governing the distribution of water; or the procedures for initiating development programmes (Latham, 2002).

A ‘tradition’, ‘custom’ or ‘indigenous’ practice is used here in this study to distinguish between what people today consider to be their own established practices and rules governing access to natural resources like water and land, as opposed to outside interventions which propose new rules and regulations to which people are unaccustomed (Dore, 1996). This definition encompasses those ‘living traditions’, those traditions that were and are still existing, with little external influence. For the purpose of this study, the terms ‘traditional’, ‘indigenous’ and ‘customary’ are taken to mean the same and will be used interchangeably.

1.7.2 Integrated water resources management (IWRM)

IWRM is the philosophy of managing the water resources of a catchment in an integrated manner. It relies on the recognition that components of the hydrological cycle are intimately linked, and each component is affected by changes in other components. At the heart of this IWRM concept is the Dublin principles, which have been widely accepted for the integrated management of water resources (see appendix 1 for the Dublin principles). GWP defines IWRM as a process that promotes the coordinated development and management of water, land and related resources, in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems (GWP-TAC, 2000). This is the definition that will be

used in this study. For the case of Zimbabwe, IWRM has been operationalised by introduction of hydrological boundaries (catchment and sub-catchments), on which stakeholders are represented, and the introduction of ZINWA as the operator and regulator of the water resources.

1.7.3 Water governance

UNDP refers to water governance as “*the range of political, social, economic and administrative systems that are in place to regulate the development and management of water resources and provision of water services at different levels of society*”. Thus water governance entails the dense and interactive networks of different types of institutions (public, private, public-private and community) to manage society and its resources. Gupta (1996) states that water governance includes “*all legal phenomena; institutions, laws and policies*”. Good water governance exists where government bodies responsible for water establish an effective policy and legal framework to allocate and manage water resources in ways responsive to national, social and economic needs and to the long-term sustainability of the available water resources (GWP, 2000). This therefore, corresponds with the definition by UNDP, and is thus the definition that will be used in this study.

1.7.4 Livelihood

‘Livelihood’ refers to “*the financial means whereby one live*”. It also refers to “*means of maintenance of a family or group*”. The Free Dictionary defines livelihood as “*the minimal source of income or marginal resources for subsisting*” or “*social security and food security, provided only a bare subsistence*”. van der Hoeck (2001) defines livelihoods as “*the means people use to support themselves, to survive, and to prosper*”. Livelihoods of rural people therefore focus on to what extent the household head is able to maintain their family or a group through provision of the basic needs of life or to improve their social status. According to Chambers and Conway (1992), “*A livelihood comprises the capabilities, assets (including both material and social resources) and activities required for a means of living*”. This introduces the aspect of livelihood strategies, which are the various means that people adopt in order to earn a living, and these vary from agriculture, formal employment, informal employment, and sometimes remittances. Chambers and Conway (1992) go ahead to state that a livelihood is

sustainable when it can cope with and recover from stresses, and shocks, maintain or enhance its capabilities and assets, while not undermining the natural resource base.

Considering all the above definitions, it is obvious that all agree that livelihoods are '*the means people use to support themselves, to survive, and to prosper*', which is the definition to be used in the context of this research. It should also be realized that livelihoods are an outcome of how and why people organise to transform the environment to meet their needs through technology, labour, power, knowledge, and social relations. It is also important to point out that livelihoods are also shaped by the broader economic and political systems with in which they operate.

1.7.5 Food security

The term "Food Security" does not have one agreed definition, and is often used broadly to mean a situation in which people have continuity of food supply, or the methods by which this is achieved. However, the Agroecology glossary (2005) defines food security as "*state in which all persons obtain a nutritionally adequate, culturally acceptable diet at all times through local non-emergency source*". Another commonly used concept is that a community enjoys food security when all people, at all times, have access to nutritious, safe, personally acceptable and culturally appropriate foods, produced in ways that are environmentally sound and socially just (Free encyclopedia, 2005). In the context of this research, the term 'food security' is taken to refer to a situation where a household is able to produce enough food for all the household members all year round.

1.8 Structure of the Report

This thesis is made up of six main chapters. Chapter one is the introduction to this study. It gives the general focus of the study, presents the problem and the rationale prompting this study, the research questions as well as the objectives of the study. The same chapter also defines the key terms of this study. Chapter two reviews the literature around TWM practices. It begins by presenting the relationship between water and rural livelihoods, presents the various TWM practices drawing examples from all over the world, but focusing mainly on examples from rural Africa, especially Zimbabwe. It explores the

aspects of IWRM and how it relates to TWM practices. Chapter three presents the study area as well as the research design used in this study to enable collection and analysis of the data. Chapter four presents the findings of the study, which are then discussed in chapter five. The report is concluded in Chapter six, which also gives the recommendations.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

This chapter gives the theoretical basis of this study paying particular attention to traditional or indigenous water management practices. In this respect it is important to state that ‘traditional’, ‘indigenous’ or ‘customary’ practices are a very wide aspect of various societies and have been applied in all sectors of people’s lives; their practice ranges from beliefs, world views¹, superstitions, to natural resource management. This chapter examines the concept of TWM practices as it is discussed in literature. It begins by showing the relationship between water and rural livelihoods, explores various examples of TWM internationally, zeroing in on case studies from Zimbabwe. The chapter then looks at the relationship between the modern water management practices like integrated water resources management (IWRM) in the context of Zimbabwe, and traditional water management (TWM). It ends with a summary of the ideas, concepts, impressions and perceptions explored throughout the chapter.

2.2 Background: Zimbabwe’s Water Reforms

Water resources management in Zimbabwe has gone through major phases of legislation, political and administrative change. It has transformed through the pre-colonial, colonial and post-colonial periods. In the pre-colonial period, the regulation of water was by the Order in Council, 1898, Section 81 pertaining to the British South African Company. It required the company to ensure that the natives or tribes had a fair and equitable portion of springs or permanent water (Derman and Hellum, 2002). Through this colonial period, the Water Acts required the colonial authorities to respect the primary water use rights of Tribal Trust Land inhabitants. This principle is embedded in the Water Acts of 1927, 1976 and 1998 (Dore, 1996). For many years, it was the Chief Native Commissioner,

¹ A world view is a set of presuppositions (or assumptions) which we hold (consciously or subconsciously) about the basic makeup of our world (James Sire, 1988). "A worldview is *an explanation and interpretation of the world* and second, *an application of this view to life*. In simpler terms, our worldview is a view *of the world* and a view *for the world*" (Phillips and Brown, 1991). Thus a worldview is like a pair of glasses through which we view the world.

who examined the effects on the water supply of a native reserve of appropriations by private individuals or the Rhodesian state. Later it became the government engineer who certified that the interests of the tribesmen are not affected (Hoffman, 1964). In debates on water laws during the colonial period, there is no participation either by “natives” or by representatives of groups with other notions of water management (Dore, 1996).

With the 1976 Water Act, there was introduction of a water allocation system. The water allocation system was based on the ‘*first come first serve*’ concept, and one had to have a land title deed if they were to get a water permit. This was unfair to the people living in the communal lands, as the government owned their land. But even so, the notion of customary law held firm (see Chikozho and Latham, 2005; Dore, 1996, Nompumelelo, 2001; Derman *et al.*, 2005).

2.3 Water and Rural Livelihoods

Water is one of the critical natural resources in life. It constitutes an essential element in rural livelihoods because of its contribution to food security and income generation from rain fed and irrigated crop production, aquaculture and livestock. Most rural livelihoods are reliant on natural resource base to a great extent (Chambers and Conway, 1992). Thus water plays a major role in ensuring food security and sustaining livelihoods, especially in rural communities. Hence, for most rural people, the ability to maintain food security depends on the effectiveness of the livelihood strategies. As a result, food production and supply in Sub-Saharan Africa countries is closely linked to utilisation and access to water, since water shortages are seriously constraining increased food production (Narendra *et al.*, 1996).

In their study, Narendra *et al.*, (1996), found out that lack of enough water resources greatly reduces the gross domestic production, and thus leads to poverty and decline in quality of livelihoods. The poverty-water association has been said to have three main elements, particularly for the rural people. Firstly, collection of water from far away is a burden, carried out normally by women and consumes precious time that could be used

better elsewhere. Secondly, debilitating diseases are caused by both inadequate quantities, and poor quality, of water. Thirdly, limited water reduces opportunities for irrigation of vegetables and fruits in 'home gardens' and keeping of stall-fed livestock (Critchley and Brommer, 2003). Water availability is closely linked to human welfare and health -it affects nutrition status and quantity of drinking water especially for the poor. These problems are more keenly felt among the poor households and in the agricultural subsistence economy, which is the case for Zimbabwe. Most of Africa's poor, just as in Zimbabwe, live in the rural areas. In such a situation making rural households secure regarding food, water and energy is a key to strategic element in reducing poverty (Narendra *et al.*, 1996). Zimbabwe is among the African countries said to have been at the risk of water stress by in the year 1990, and is projected to be water stressed by the year 2025 (with less than 1000m³/capita/year) (Narendra *et al.*, 1996; SADC 2002). But the problem goes much beyond physical water scarcity. At the second World Water Forum held in 2002, it was recognized that the water crisis is mainly a crisis of governance (Arriens and Alejandrino, 2004). Delegates at the Second World Water Forum pledged to institute reforms in the water sector to improve governance. There is therefore a case for managing the water resources in Zimbabwe in a sustainable way through improved water governance.

Most African countries, including Zimbabwe recognise that water resources must be used wisely to improve human welfare, achieve economic growth and therefore reduce poverty. In the Ministerial Declaration of the International Conference on Freshwater held in Bonn, it was recognised that "combating poverty is the main challenge for achieving equitable and sustainable development and water plays a vital role in relation to human health, livelihoods, economic growth as well as sustaining ecosystems". Ndalawha (2002) recognises that water scarcity is an important environmental constraint to development. However, there are claims that these water reforms, claiming to be objectively focused at improving livelihoods among other things, have failed to address the poverty issue at the grassroots level. According to van der Hoeck (2001), unless there is new action to recognize both the roles water plays in rural livelihoods and people's capacity to manage their water sustainably and with social justice, water scarcity

threatens to change people's options in production, employment, and exchange, and the relations among these activities, in ways that will exclude the small producer. For example, in Zimbabwe, new smallholder irrigation systems are being developed and old ones are receiving new support that can improve water supply and livelihoods for more people (van der Hoeck, 2001).

It is also important to realize that when people have water dependent livelihood strategies, they create relationships of cooperation and control in order to acquire and manage water systems. How livelihoods survive under scarcity is related to how people understand water scarcity, organize social action to remedy it, and act to defend their rights. Improved rural water governance is a powerful tool to diversify livelihoods and reduce vulnerability, especially for small producers, who are the communal farmers for the case of Zimbabwe. Thus designers, planners, and managers can support rural livelihoods when dealing with water governance by appreciating the many roles of water in rural livelihoods and giving rural users scope to negotiate and defend their livelihoods.

However, is there a way out of the poverty trap where water supplies are low? Can prudent and creative use of limited water, and an integrated approach right from the local scale make a big difference in water scarce areas? It is well established that investments in water resources management and the delivery of water services are central to poverty reduction. Interventions in the management of water resources or delivery of water services could further entrench inequalities and reduce already lamentable access of the poor to these resources unless they have an explicit poverty objective (Reba, 2003). With water scarcity and increasing competition for water, there has risen the need for more effective and adaptive governance through better stakeholder participation, improved policies and institutional mechanisms for managing river basin water resources.

Effective stakeholder participation in water resources management calls for a strategy that better involves the water user at the most local scale; a system that contributes to poverty reduction through improved and sustainable water resources management. This would involve empowering the local communities in natural resources management, and

consultation with communities on their needs and the appropriate mechanisms they have to address those needs in water issues. One of the strategies proposed by Narendra *et al.*, (1996), as a way of improving water resources in order to lessen the impact of future water scarcity is the consideration of customary law and models of water governance. These scholars further suggest that since customary practices play a critical role, are still applicable especially at the local level and blends well with the participatory approaches required by new thinking in water resources management, it presents a great strength for improved water governance that has not been explored by the policy makers.

2.4 Traditional Water Management

As previously mentioned, a ‘tradition’, ‘custom’ or ‘indigenous practice’ is used here to distinguish between what people today consider to be their own established practices and rules governing access to natural resources like water and land, as opposed to outside interventions which propose new rules and regulations to which people are unaccustomed to. Worldwide, traditions are unique to different ethnic groups. For most rural communities, tradition or customary laws are a form of cultural identity, which uphold their worldviews, and therefore give them a sense of identity (Latham and Chikozho, 2004).

Most researchers agree that TWM practices still exist and are still strong rooted (See Dore, 1996; Derham and Hellum, 2002; Shearer, 2003; Chikozho and Lantham, 2004; Juma & Maganga, 2000; Manzungu and Machiridza, 2005). This body of literature reveals that traditional systems of water management prevail among rural communities and are often effective and some have survived many centuries. More importantly they have not been completely destroyed by the colonial or post-colonial state. These customary practices are well understood by the people and are functional because they have congruence with their worldviews. Most rural livelihoods are reliant on the natural resource base, like water and land to a great extent. The ability to pursue different livelihood strategies depends on the practices that the people have in their possession (Chambers and Conway, 1992). When rural people build their livelihoods around water, they create relationships of cooperation and control in order to acquire and manage water

systems. These have existed long before the introduction of any modern methods (van der Hoeck, 2001).

TWM systems are a feasible option for improving the living conditions of rural people currently facing serious water problems (Shearer, 2003), particularly in dispersed and isolated rural settlements, TWM can compete with other more modern water options. This is largely because new statutory provisions do not reach out to all areas of the society while customary water laws will continue to be durable. Unfortunately policy makers tend to continue with these statutory laws, which have a poor reach. In Africa, such areas not reached by statutory provisions consist mostly of the rural areas, where societies are still depending upon their customary laws. The existence of more than one law governing the society leads to the situation known as '*legal pluralism*', which is the existence of both 'formal state law' and 'local customary law'. The laws may sometimes conflict. Such examples of legal pluralism have been revealed in case studies from Tanzania (see Juma and Maganga, 2004), Zimbabwe (Chikozho and Lantham, 2004) and in the Bali island in the Blahpane village (see Spiertz, 2000). Some researchers argue that legal pluralism is necessary for the effective management of water resources (see Mumma, 2005). This is firstly because customary law existed before the introduction of IWRM, and people are accustomed to it, and secondly because the state law does not usually reach the most rural areas. Underlying this concept or line of thought is the realization that customary or traditional practices should not be ignored at the expense of the modern management methods.

2.4.1 International experiences

Examples of traditional irrigation methods from Latin America include; Qanat irrigation in Mexico (see Enge and Whiteford, 1989), irrigation in Cochabamaba, Bolivia (see Gutierrez and Gerbrandy, 1998) and in Ecuador (see Apollin *et al.*, 1998); tank irrigation in Sri Lanka (see Leach, 1961), Subak irrigation in Bali, Indonesia (see Leach, 1961) and irrigation in the hills of Nepal (see Yoder and Martin, 1998).

Among other TWM practices were the traditional water harvesting systems that have been practiced all over the world. These tend to be unique to the various societies; studies from Kenya revealed the '*fanya juu*' structures for capturing the runoff in the agricultural fields. In India, water has been harvested since antiquity, with many water-harvesting structures and water conveyance systems specific to the eco-regions. Such examples from India included the *Tankas* (small tank), which were underground tanks, found traditionally in most *Bikaner* houses, the *khadin*, also called a *dhora*. This *dhora*, harvested surface runoff water for agriculture and its main feature was a very long (100-300 m) earthen embankment built across the lower hill slopes lying below gravelly uplands. Sluices and spillways allowed excess water to drain off. The *khadin* system was based on the principle of harvesting rainwater on farmland and subsequent use of this water-saturated land for crop production. (see www.rainwaterharvesting.org). Other structures like *baories*, *nadis* and small *kutch*a bunds, *kunds*, and *ahars* were all examples of water harvesting systems. These water bodies were adopted depending on the cultural value-system of the regions and were carefully maintained, appropriately located and constructed with simple, yet excellent, engineering techniques.

2.4.2 Africa

Some examples of TWM in Africa include; irrigation in the Taita Hills, Kenya (Fleuret, 1985), irrigation by the Sonjo, Tanzania (Adams *et al.*, 1994), and rice cultivation in Basse Casamance, Senegal (van der Zaag, 1992). Such cases display the success and resilience of traditional management practices and their great value to the rural people in the respective communities. This section specially focuses on cases of TWM in Africa.

Research in Pangani and Rufiji Basins in Tanzania reveals that the country operates under a plural legal system; although water reforms in the country focus on the use of statutory legal systems to regulate the use of water resources, diverse customary systems are relied upon in resolving water-related conflicts (Maganga *et al.*, 2003). Similar examples where water related conflicts are settled through the traditional leaders include the *Masai*, and the Oldonyowas, (Huggins, 2000) and in Ethiopia among the *Oromo* people, where this is known as the *Gadaa* system, which is a uniquely democratic political and social

institution, which is made up of elders (Chemedo *et al.*, 2005). Another example of traditional water resources management techniques is the indigenous solid and liquid waste treatment found among the *Ngwa* of south-eastern Nigeria (Izugbara and Umoh, 2004). These are practiced by the urban people, and include ingenious and careful waste segregation and sorting, selective burning and burying, composting and conversion, in order to protect their water resources from pollution.

2.4.3 Zimbabwe

A comparable amount of research has been done on TWM practices in Zimbabwe. A number of cases studies have been documented, majorly focusing on irrigation. Such customary norms and practices, as observed in a wide range of studies of natural resource management in Zimbabwe's rural areas and international human rights law, emphasise that natural resources, such as food and water, are vital for rural livelihoods (Derman *et al.*, 2005).

Soper's study on Nyanga revealed irrigation furrows as archaeological water management technologies, which dated as far back as the early years of European settlement (around the 1890s) (see Soper, 2002). Farmers in the communal area used these irrigation furrows, but never applied any formal water rights. There was a strong sense of a historical user right to the river water for irrigation. Similar TWM technology was identified in the Nyanyadzi catchment in the eastern highlands, which dated back to pre-colonial times. The furrows were simple and straightforward earthen constructions, the furrow intakes were not permanent and were made of locally available materials such as rocks and sticks, they were all leaky. There was a taboo on making intakes in the river from concrete (Bolding *et al.*, 1996). This system exhibited a high level of ecological integrity (water for the environment). This was because the Chief did not allow the people to divert all the water from the river, as it would kill the water creatures (*mugadzemvura*). The water allocation was not based on a formal system, but on a 'cultural' system; no one was in charge of the distribution, they gave each other chances to get the water, and in case of conflicts, the traditional village leaders mediated (Bolding

et al., 1996). This also instilled cooperation and social organisation, especially when it came to maintenance of infrastructure since all the water users were directly involved.

Through their research, Derman and Hellum (2002) discovered that people in the rural Zimbabwe still rely on customary institutions for managing water. They discovered that 73% of the villagers in Mhondoro responded that either the chief or the spirit medium was the most important person in allocation of their water resources. When asked what they did to maintain their water supplies, 84% said they observed rules and or performed rituals. This shows that the link between rainfall, the ancestors, social relations and the land remains strong despite the introduction of the modern practices (see Derman and Hellum, 2002; Sithole P., 2002; Nemarundwe, 2003; Sithole B. 2001).

Scoones and Cousins (1994) who studied wetlands for agricultural production, in Zimbabwe, established that the control over these *dambos* was sometimes traditional, through the 'lineage leaders'. The ruling lineages claimed legitimacy based on "sacredness" and the "authority of the ancestral spirits"; this they used to exert control over outsiders who were in competition for use of key *dambos* resources – notably water (see a similar study by Sithole, B., 1999). Another example of traditional systems of management was reflected in the drought and conflict management in Mutema where people believed that royal ancestral spirits brought rain. People worshipped their forefathers who they believed answered them with rain. This was done through the spirit medium that advised the people to work together and cooperate, because if they did not, there would be no rain (Vijfhuizen, 1999).

Chikozho and Latham (2005) revealed how the *Shona* customary practices were still deep rooted and functional, despite the influence of colonial and post-colonial regimes, traditional institutions still remained relevant to local communities. They explored how the *Shona* culture used the traditional leaders hierarchy to address water related issues, especially in resolving conflicts. Additionally, underlying most of the TWM practices was the aspect that no one should be denied access to water. Related research by Derham, Hellum and Sithole (2005), which revealed that in the *Shona* culture, everyone had a right

to water. The *Shona* believed water was a part of the human right to livelihood; no one was denied water, this was applicable to men and women, insiders and outsiders, and this pointed to a notion of equity and non-discrimination.

It was apparent from Magadlela's research (1999) that traditional authorities in Zimbabwe were still strong rooted; the headmen in Eastern Zimbabwe, in Nyamaropa irrigation scheme. During the implementation of the scheme, people had to pay *mutete*, a gift to the headman as a sign of respect, and asking for permission to reside and cultivate in the Headman's territory. All the early irrigators in the new scheme had to pay some money to the headman and the village head. The headman had the responsibility to persuade the people to come and cultivate in the irrigation scheme. This reflects how the people are still respectful and loyal to their traditional leaders. Another example of the traditional practices is the rain making (a case from the Mutema Chieftaincy in Zimbabwe); the people in that Chieftaincy believed that drought occurred when the *vatape* (village heads) did not co-operate (Vijfhuizen, 1999). The rain making ceremony (which is annual), involved all people, the men and women together. The significance of such beliefs like rain-making ceremonies went beyond the face value; it was a very religious ceremony that aimed to unite the people in resource management, who believed that if the leaders or people themselves fought, there would be a drought. This enhanced the peace and improved on social organisation enjoyed in the villages.

2.4.4 Conclusion

The previous sub-sections have presented various examples of TWM practices from all over the world, focusing particularly in Zimbabwe. These TWM practices are mostly observed amongst rural water users, who still rely upon customary laws to govern their water resources. This has exposed that TWM still exists, has stood the test of time, and has proved to be effective water governance, and in sustaining rural livelihoods. Moreover, from research based on three case studies from Tanzania, Egypt and Djibouti, Shearer (2003) argues that TWM systems are a feasible option for improving the living conditions of rural people currently facing serious water problems.

2.5 IWRM in Zimbabwe

IWRM is based on the concept of stakeholder participation in decision-making in water management. In Zimbabwe, the stakeholders are represented by the catchment councils (CCs) and sub-catchment councils (SCCs), who are elected by the water users based on the catchments and sub-catchments, respectively. The catchment councils prepare outline plans, determine applications and grant permits, regulate and supervise exercise of water rights and supervise performance of sub-catchment councils. The day-to-day water management is carried out by sub-catchment councils, who have power to levy fees from water users, unlike catchment councils, which derive their budget from a water fund. CCs and SCCs are democratically elected as representatives from the major stakeholder groups. The case of IWRM in Zimbabwe entails the formation of the national water authority, ZINWA which employs catchment managers in each catchment who manage the day-to-day operation of the CCs and SCCs, and may sometimes make decisions about issuing of water permits, which will over rule the decisions made by the CCs and SCCs.

First and foremost, IWRM has been seen as a completely foreign concept, that is being imposed on the African by the western culture (Swatuk, 2004), despite the already existence of their own water governance systems. Among the IWRM concepts, there seems to be loopholes; firstly, as observed, IWRM is a very centralist concept, where by the role of the state is pronounced; the state dictates the concepts in which the

stakeholders participate. Secondly, the concept of stakeholder participation based on the catchments and sub-catchments seems not to be clearly defined; it does not allow this joint management of water resources to go to the lowest levels possible, the local person especially in the most rural places. Thirdly, the aspect of introduction of hydrological boundaries, which is completely alien and thus abstract to the people, questions the practicability of IWRM. This raises the issue of the best level at which to organise stakeholder participation: the catchment or river basin? (Manzungu, 2004). Firstly, the catchments are seemingly too big to address issues at the lowest level, and secondly, organising stakeholders on a catchment basis makes it difficult to ensure participation at the basin level, as stakeholders can lose sight of the bigger picture. This may exclude stakeholders from discussing transboundary water issues that are based on basin commissions and are often negotiated between states. Organising stakeholders at the basin level as an entry point is likely to result in losing sight of the realities of the local level.

Zimbabwe appears to have brought into neoliberalism – the doctrine currently driving the global water reform debate (Manzungu, 2001). In addition, the new water concept of IWRM lacks relevance for rural communities, who rely on their indigenous systems for the management of natural resources. (Chikozho and Lantham, 2004). Such indigenous institutions may vary among societies and are in most times informed on ethnicity. The question however, that we need to ask now is: can the global agenda (of IWRM) effectively engage with the local realities in a developing country like Zimbabwe, especially in cases where already existing traditional water governance systems may differ?

IWRM emphasises the aspect of stakeholder participation. However, ‘stakeholder participation’ in Zimbabwe’s water sector seems to be more of a philosophy than an operational concept (Manzungu, 2002). This is partly because no attention has been paid to how stakeholder participation can be designed and practically effected. Some of these include: the use of English in the meetings, which is barely understood by the locals (Sithole, B., 2001), there was failure to take into account existing local organisations that

directly, or indirectly, have previously been involved in the water sector, and also the issue of women not being directly involved in the decision making as observed by their scarcity or absolute absence, as in the Save catchment. (see Manzungu, 2002; Latham, 2002).

From eleven case studies of IWRM implementation around the world, Visscher *et al.* (1999), highlight how the success of projects at the grassroots level is failing to be built upon at the district/regional/catchment level, with the result that genuine stakeholder involvement in IWRM remains elusive. This is partly due to the fact that much remains to be done in terms of developing methodologies for its practical implementation. Included in these possible methodologies should be the consideration of the TWM practices at local level. These are usually unique to most rural areas.

2.6 Summary

The current chapter has shown that water is an important resource for rural livelihoods, both in terms of food production and income generation, and that water scarcity leads to poverty. The chapter has also presented various TWM practices that various societies from all over the world, especially in Africa, have relied on for water governance and sustaining their livelihoods. However, while rural livelihoods have depended on traditional wisdom to manage their water resources since time immemorial, the introduction of modern water management practices has neglected the potential of this TWM. This could be one of the reasons why IWRM has failed to address issues at the most local scale.

Therefore the major question now is; how does IWRM hope to improve rural livelihoods through improved water governance while neglecting TWM? As Manzungu (2002) queries; could it be that what Zimbabwe needs is local actions for local problems? The search should not be for blue prints, the focus should rather be on providing principles for local water management while taking global trends into account. Thus this research has

been undertaken to reveal the TWM practices and how their implications are for improved water governance.

CHAPTER 3: METHODOLOGY

3.1 Introduction

This chapter presents the area where the study was carried out, and the methods used in this study. It begins by describing the study area. It then discusses the design of this research and the research instruments used to collect the data. The chapter further discusses the sample design, the sampling techniques and the criteria for the choice of sample size. It also gives details of the data collection process and the problems encountered during data collection. The rationale behind the selection of the data analysis method used is given. Last to be presented is a discussion of the gaps in the data.

3.2 Study Area

The study was done in Zimbabwe, a country located in the Southern African region and is part of the SADC. Zimbabwe is a land locked country located between latitudes $15^{\circ} 30'$ N to $22^{\circ} 30'$ S, and longitudes 25° W and 33° E. The country borders with South Africa to the south, Botswana to the Southwest, Namibia to the west, Zambia to the North-West and north, and Mozambique to the east (Figure 3.1).

The economy of the country depends on agriculture, where both large scale and small scale farming is practiced. Zimbabwe currently falls under the category of water stressed counties along with South Africa (SADC Technical Report, 2002). The country is divided into seven hydrological catchments; Manyame, Runde, Mzingwane, Gwayi, Mazowe, Save and Sanyati (Figure 3.1). Perennial rivers characterise the wet parts of the country whilst seasonal flowing rivers characterize the dry parts. As a result, water supply and management vary greatly across the country. In the dry parts, the constant supply of water is from underground (by boreholes) or from developed water sources such as dams and lakes.

This study focused on wards 3 and 11 of Insiza district, one of the numerous districts of Zimbabwe. The Insiza district is located in Upper Mzingwane, which is one of the four sub-catchments of the Mzingwane catchment. The Mzingwane catchment is one of the seven catchments of Zimbabwe, and is part of the Limpopo Basin, which falls in the Zimbabwean side. This sub-section describes the area in which the study focused; it presents the general study area, the Insiza district, the Limpopo Basin and the Mzingwane catchment and also details about the specific study site, Ward 3 and Ward 11.

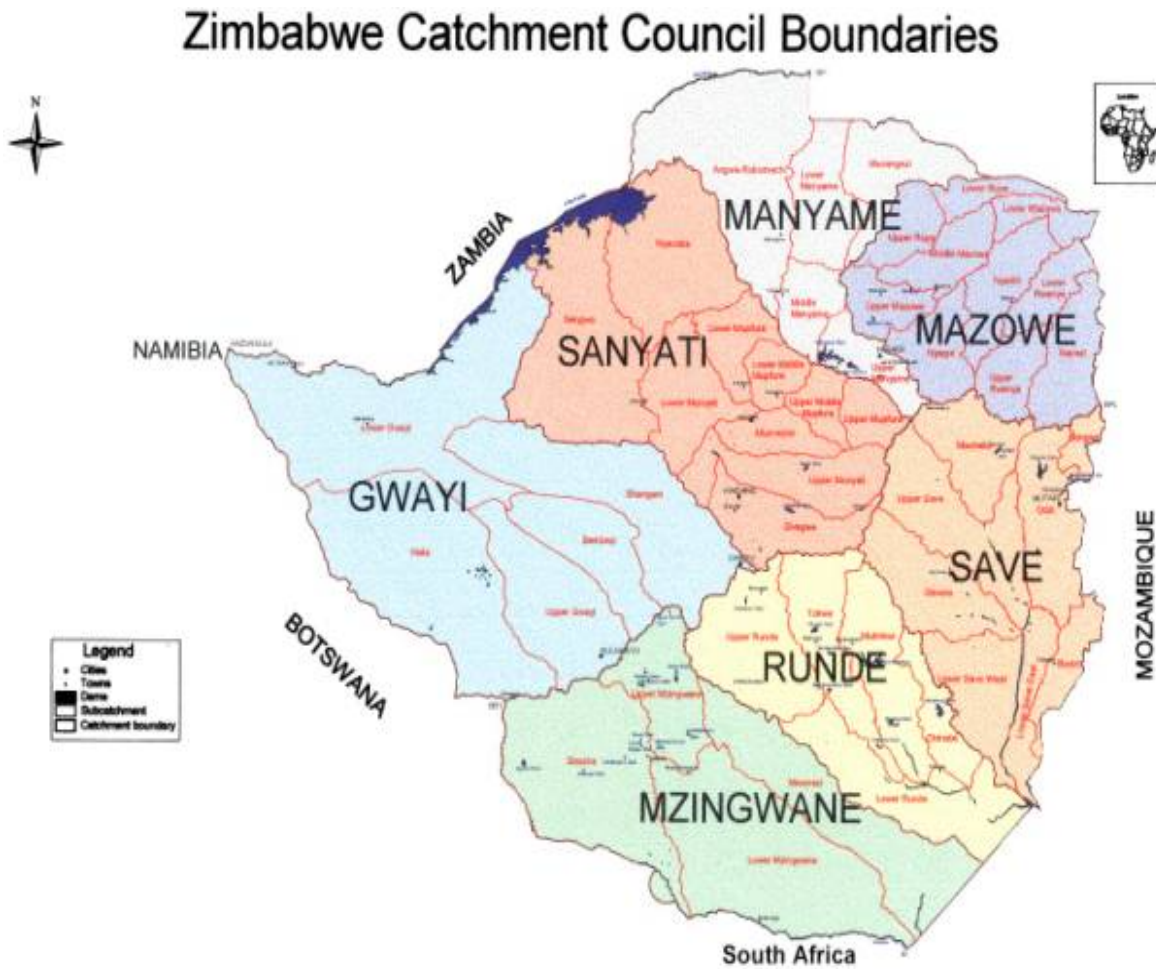


Figure 3.1: Map of Zimbabwe with Hydrological boundaries and Neighbouring Countries.

(Source; Surveyor General's Office)

3.2.1 The Limpopo Basin

The Limpopo Basin straddles four countries; Zimbabwe, Mozambique, South Africa and Botswana (Figure 3.2). The Basin occupies 401,864km². It occupies by land area 12.8% of Zimbabwe, 21.2% of Mozambique, 19.9% of Botswana and 46.1% of South Africa (Table 3.1). The total length of the main river is about 1,750 km and is located between 20° and 26° South and between 25° and 35° East. The Basin occupies an area of 62,760 Km² of Zimbabwe. The major tributaries of the Limpopo River are Shashe, Umzingwane and Bubi.



Figure 3.2: Map of the Limpopo Basin and bordering countries

(Source Encarta library 2003)

Table 3.1: Limpopo Basin; areas and rainfall by country

Country	Area of the country within the Basin (km ²)	As % of total area of Basin (%)	As of % of total area of country (%)	Average annual rainfall in the basin area (mm)		
				Min.	Max.	Mean
Botswana	80,118	19.9	13.8	290	555	425
Zimbabwe	51,467	12.8	13.2	300	635	465
South Africa	185,298	46.1	15.2	290	1040	590
Mozambique	84,981	21.2	10.6	355	865	535
Limpopo	401,864	100.0	N/A	290	1040	530

Source: FAO 1997

3.2.2 The Mzingwane Catchment

The Mzingwane Catchment (Figure 3.3) is one of the seven catchment areas as demarcated by the new water legislation that was enacted in 1998. It is approximately 5,1467km² in size. The Basin is semi-arid. It receives rainfall of 250 – 550 mm per annum. For this reason, water management is a very vital issue, because water is scarce. Generally, the dry months are between April and October. The northern parts of the catchment are wet, receiving approximately 635mm of rainfall, and have good soils. The South and East are drier, receiving about 300mm of rainfall, with sandy soils. The rivers flow North – South (or Northeast – Southwest). Land use is majorly commercial cropping in the North, ranching and commercial use in the South and East.

The Mzingwane catchment is divided into four sub-catchments: Shashe, Upper Mzingwane, Lower Mzingwane (including the Bubi) and Mwenezi. The catchment consists of those rivers, which are tributaries of both the Shashe (which in turn is the tributary of the Limpopo) and of the Limpopo. These include; the Ramabaquane (which forms the boundary with Botswana); Sanasukwe, Simukwe, Shashani, Thuli and Hwali (all tributaries of the Shashe which also forms a boundary with Botswana).

The rural water users in the catchment vary in ethnic groups; *Ndebele, Venda, Kalanga, Sotho, Shangani, Khoi-san* and *Fingo* (Hachipola, 1998), all of which have varying livelihood strategies. They may also differ in their water management practices, perceptions and values.

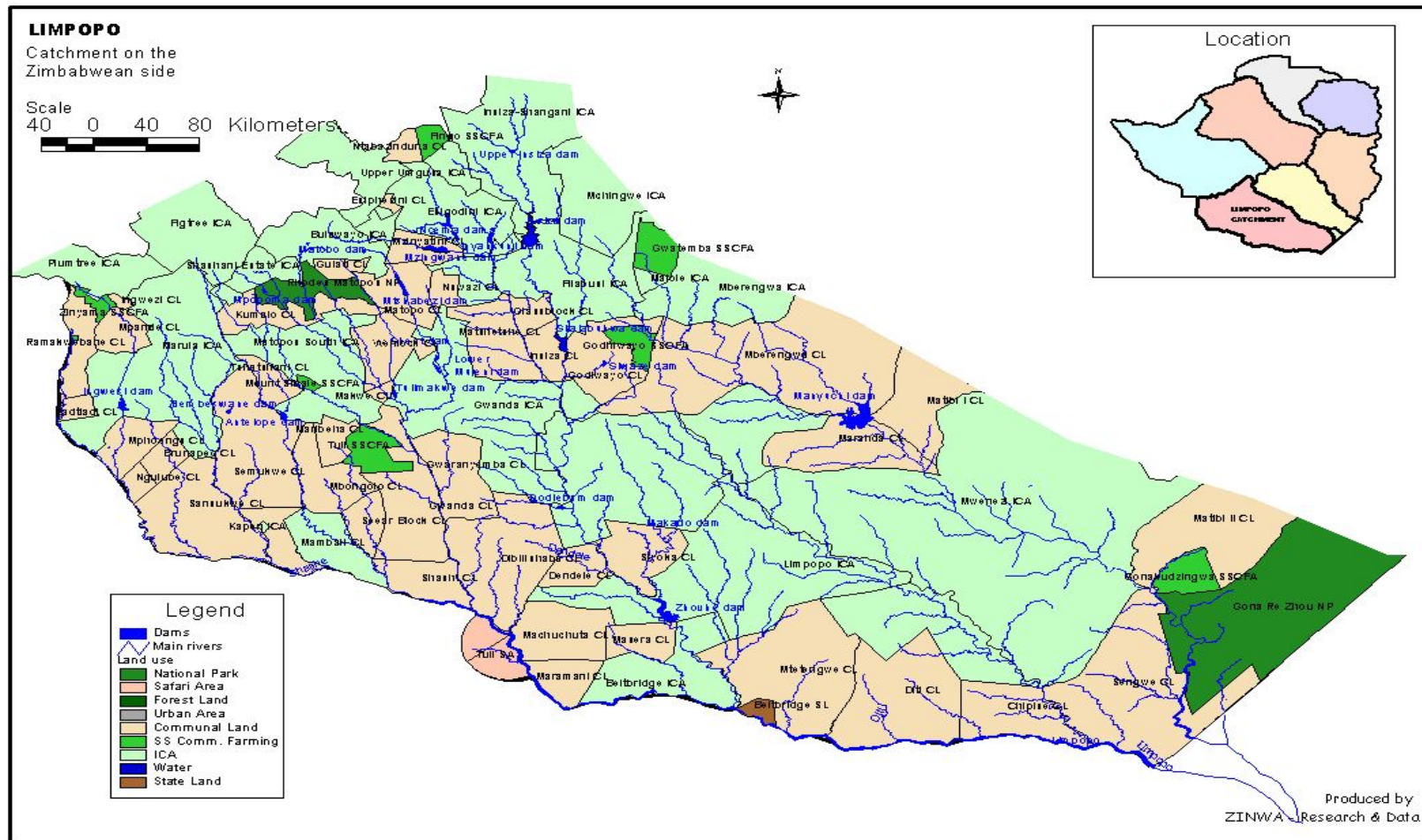


Figure 3.3: Map of the Mzingwane Catchment

(Source: ZINWA offices)

3.2.3 Insiza district

Fieldwork was conducted in the Insiza district in the Matebeleland South Province of Zimbabwe, one of Zimbabwe's ten administrative provinces. The provinces are subdivided into districts, which are further divided into wards. The wards are made up of villages. This outline forms the organizational hierarchy of administration within the province of Matebeleland South. The Insiza district, where this study was conducted, is one of the six districts in this province.

The Insiza District has a population of 86,300 according to (CSO, 2002). It has 18 wards, 11 of which fall within the Mzingwane catchment. The research work covered two of the wards; Ward 3 and Ward 11. The people of Insiza District are predominantly of *Ndebele origin*

Socio-economic characteristics

Most people in the district depend largely on subsistence farming, where vegetables and cereals are grown during the wet months. They also rear livestock. In other parts of the catchment, livelihood activities include wildlife farming in conjunction with tourism, commercial agriculture specialising in tobacco, maize, wheat and livestock. There are about 30 dams of various sizes within the catchment whose water is used for irrigated agriculture and domestic purposes. The responsibility of financially providing for the family lies on the shoulders of the household head.

Water resources

Insiza District falls in natural region 4, a region receiving an average annual rainfall of 350 mm per annum. Annual evapotranspiration rates are high, with a mean annual evaporation of 5-6 millimetres (Meteorological Department, 2004). Water sources include dams, boreholes, protected wells, unprotected wells, streams and rivers. The water is used for domestic purposes and extra quantities are used for productive purposes such as watering small gardens.

Most of the rivers in the area are seasonal, flowing only during the rainy season. The Insiza River dries up during the dry months (May – September), and has to periodically rely on water released from upstream Mayfair Dam. In the dry months, some of the boreholes and unprotected wells also sometimes run dry, and the communities have to rely on very distant sources for water.

3.2.4 Specific study sites

Given the size of the Mzingwane catchment, it would have been very costly to attempt to survey the whole catchment. Hence a small section of the catchment was taken to represent the rest. Within the Insiza district, the case study of interest was the Chief Sibasa area of jurisdiction, which covers two wards; Ward 3 and Ward 11 (Figure 3.4). This area is located in the communal lands where people practice subsistence farming. There is an irrigation scheme near the study sites, the Silalachane. People from the neighbouring village have plots in the irrigation scheme. The case study revolves around the Sibasa dam, a perennial source of water.

The total population of the people in the Wards 11 and 3 is estimated to be 9,525 and 6,403, respectively, as of the year 2002 (AREX office). The livelihoods of the people in this area are based on agriculture, specifically crop production and livestock production (Table 3.3). Other sources of livelihood include casual labouring, informal employments in cities, gold panning and brick-making. The major crops grown include sorghum, maize, cowpeas and groundnuts, while the major livestock includes cattle, sheep, goats, pigs and donkeys.

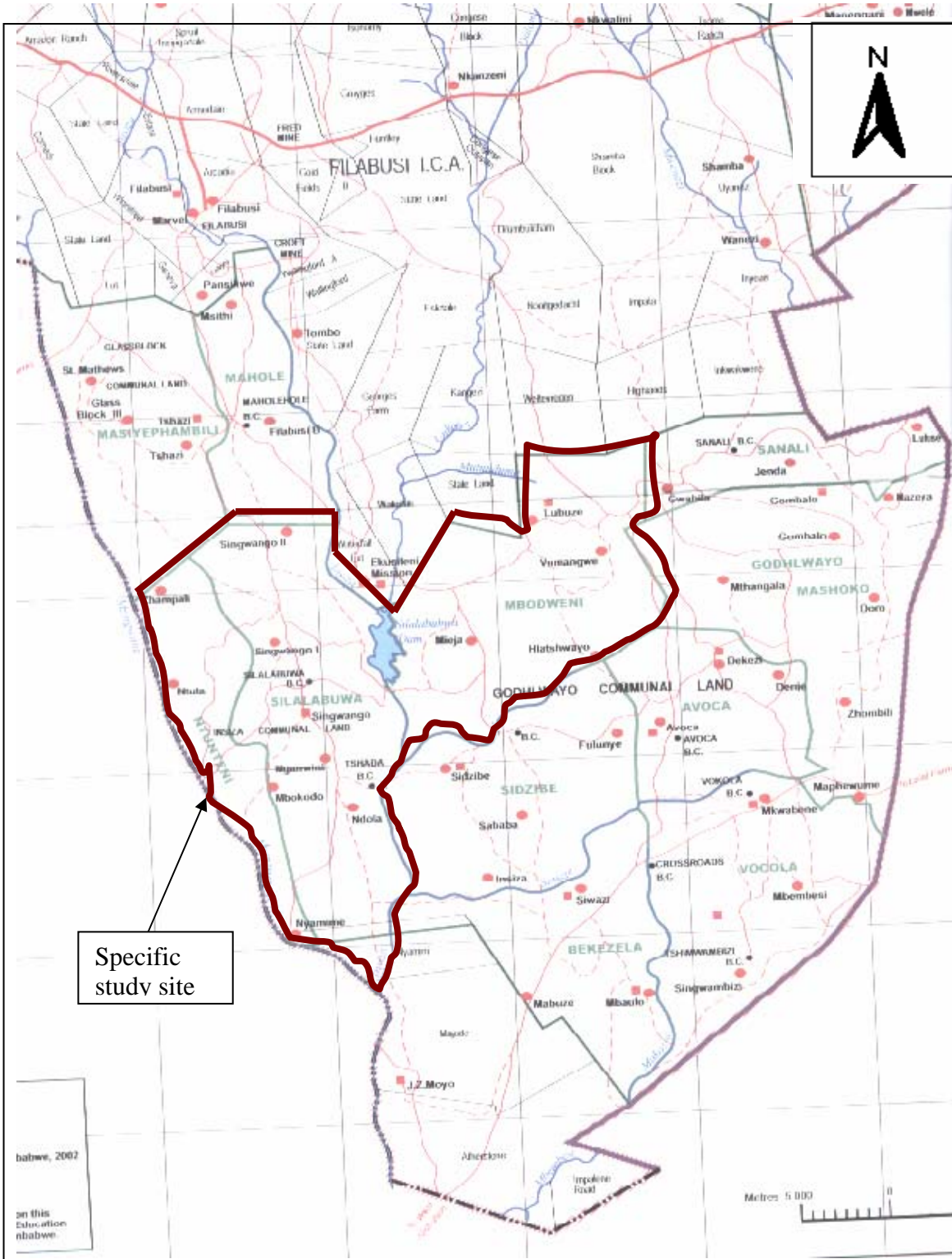


Figure 3.4: Map of Insiza District showing location of specific study site
 Source: Surveyor General's Office, Harare.

The study area has twenty (20) dams (Table 3.2). Only one, Silalabuhwa, is large enough to accommodate irrigation. The rest of the dams are basically small multipurpose dams, used for domestic water use, livestock watering and rarely for watering small gardens (Table 3.1). The total number of boreholes in Wards 3 and 11 were sixty-six (as of February 2005 (AREX offices, Filabusi).

Table 3.2: The Dams in the study area, (Wards 3 and 11)

Ward	Name	Grid Ref.	Catchment (Km ²)	MAR (m ³)
Ward 3	Kaba	QG 438 906	3,0	114 000
	Emganwini	QG 435 979	5,0	190 000
	Jacobe	QG 413 915	0,3	6 000
	Levi	QG 395 939	15,0	285 000
	Tekwane	QH 385 059	1,0	19 000
	Duze	QH 426 008	0,5	19 000
	Sibasa	QH 405 049	3,5	133 000
	Silalabuhwa	QH 462 009	-	-
	Jowana	QH 398 078	6,0	228 000
	Simoni	QH 393 059	0,3	11 400
	Simeza	QH 385 041	13,0	247 000
	Mawela	QG 393 969	7,5	142 500
	Dambula	QG413 914	-	-
	Ndola	QG417 907	1,0	19 000
	Imvu	QG416 887	1,9	36 100
		Sidleni	-	-
	Bwuma	-	-	-
Ward 11	Mbokodo	QG 372 952	16,0	304 000
	Kalanka	QH 365 044	3,0	57 000
	Zhampali	QH 357 077	8,0	152 000

Source: DDF Files

Table 3.3: Details of Dip tanks in Wards 3 and 11

Dip Tank	Area	Cattle		Sheep	Goats	Pigs	Donkeys	Horses	Dogs	Ostriches
		Dairy	Beef							
Mzingwane	Insiza	-	661	601	1179	-	160	-	125	-
Mtelo	Insiza	-	497	301	906	-	201	-	113	-
Silalabuwaha	Insiza	-	720	604	980	5	703	-	140	-
Tshaba	Insiza	-	1477	810	1105	-	930	-	165	-
Sibabsa	Insiza	-	394	78	100	-	96	-	45	-
Kalanke	Insiza	-	917	709	1001	-	950	-	155	-
Mganunkomo	Insiza	-	1603	100	1430	-	977	-	160	-

Source: Department of Veterinary Services, Insiza District, Filabusi.

3.3 Research Design

A research design refers to the arrangement or organisation for the study, used as a guide for collecting and analysing the data (Neuman and Wiegand, 2000). In this study, while trying to assess the TWM practices, the researcher employed the case study approach. The case study method is very helpful in drawing out data through an in-depth study (Tellis, 1997). In this study, unstructured and structured questionnaires were used to survey the TWM practices in this area. The data collected was of two types; quantitative and qualitative data. 'Quantitative' data is data that is in numerical form and 'qualitative' is data that is not in numerical form. The tools used in collecting the data included unstructured questionnaires with informal interviews, structured questionnaires and the respondent's impressions. The data collected was analysed using the statistical package for social sciences (SPSS 10.0), while the data obtained from the semi structured questions and unstructured interviews was analysed thematically.

This study informed by the actor-oriented framework of the sociological study (Long, 1992). It regards the water users as actors in a society, whose views differ, but maybe incorrect or misguided. Thus in the analysis of the data collected, the responses of the individual households were constantly compared to those of the key informants and also to the researcher's observations.

3.3.1 Tools for data Collection

During this research, in order to capture the intended information, two types of questionnaires were used; unstructured questionnaires and structured questionnaires. An unstructured questionnaire is one where by all or most of the questions are open-ended (A2 Media, 2004), while a structured questionnaire is one whereby all or most of the questions are closed (Lopez-Escamez, 2005). The unstructured questionnaires for key informants (see appendix II) were combined with informal interviews, which were recorded in the researcher's field book. These key informants included the catchment manager, traditional leaders, AREX officials, elders in the communities, and district and ward councils. The other questionnaire used by the researcher was a structured questionnaire, which was administered to the individual households (see appendix III).

For both questionnaires, the questions centered on the people's water management practices, their social organization, the role of traditional leaders, how water is allocated, the role of the youth and women in water management, how conflicts were resolved, and how all these linked with the modern water management practices. The questionnaires also focused on how the different communities manage water at the community level, how maintenance and discipline around water sources was conducted. The questionnaire for the individual households combined different water uses; domestic water, livestock watering, small garden watering, irrigation and any other major water use like brick making.

3.3.2 Sampling

Purposive sampling can be very useful for situations where one needs to reach a targeted sample quickly and where sampling for proportionality is not the primary concern. The method used for sampling the respondents to the key informants was the 'Purposive Sampling' where we sample with a purpose in mind (Trochim, 2001) where we have one or more specific predefined groups we are seeking. In the context of this research, the researcher was targeting the traditional leaders; the chief, headmen, village heads, the AREX officials and ward councils. These were thought to be knowledgeable about the general aspects of the management of the water resources in the study area. The

information obtained from these key informants helped the researcher to formulate the questionnaires for the individual household heads.

The sampling method used for the respondents to the questionnaires at household level is the 'Accidental sampling' also known as 'Haphazard' or 'Convenience' sampling (Trochim, 2001), which is one of the most commonly used methods of sampling. In this research context, the researcher sampled simply by asking for volunteers. Clearly, the problem with this type of sampling is that the researcher has no evidence that the volunteers are representative of the populations the researcher is interested in generalizing to.

The selection of the different areas to administer the household questionnaires was by convenient sampling. Convenient sampling is a non-probability method that saves both time and money, which were both very crucial in this study. It is an inexpensive approximation of the truth (Stat Pac Inc., 2004). Hence the selection of the study sites was according to the water uses; the researcher chose different villages where the activities for water use differed. The first village of interest, Sibambaneni, was around the case study, the Sibasa dam, the second village was Zenzele, where most people do not practice irrigation. However, most people from Zenzele engaged in small garden watering. The third village, Siyabalandela, constituted the formal irrigation-based village, where more than 85% of the people practice formal irrigation at the Silalabuhwa irrigation scheme.

3.3.3 Timing of data collection

The research was carried out between December 2004 and April 2005. During the course of this study, the researcher made three visits to the field. The first visit to the field was a reconnaissance visit in December, which was two fold; first for familiarization so that the researcher identifies, demarcates and becomes conversant with the study area, and identifies the study sites, and second to inform the relevant authorities about the research. The second visit, which was in February, was an informal survey that was mainly to the traditional leaders, the district and ward councils, to identify the different livelihood

strategies and the TWM practices in the area. The third and last visit to the field was in April, and was purposely for the in-depth study of the water resources management practices in the area. The structured questionnaires were administered to the individual households from the two wards in the area of study, which are ward 3 and ward 11.

3.3.4 Data Analysis

The questionnaires were first cleaned and organized for analysis, this was by ensuring that all the responses were legible, all the important questions answered, all the responses were complete and all relevant contextual information was included (for example; data, time, place, researcher). The unit of analysis in this study, used in the analysis is the individuals, that is, the household heads. These individuals constitute the water users, who use water for different purposes; domestic water (drinking, washing and cooking), water for watering small gardens, water for irrigation and water for other purposes like brick making.

The quantitative data collected has been analysed using the SPSS (see appendix IV for results tables). Descriptive statistics were used to describe and organize data; the data has been summarized by averages and has been presented in the form of frequency distribution tables and graphs. The findings from the informal surveys with the key informants were incorporated in the findings from the SPSS, and they have been very useful in explaining most of the findings from the household heads.

3.4 Challenges Faced During the Study

The first challenge the researcher faced was communication, especially with the individual household heads. While all almost all the key informants could speak English, very few of the household heads were conversant with the language. The researcher had to use an interpreter, which could have led to the researcher failing to capture certain expressions of the people. The other challenge was ethical; when the respondents were asked about their livelihood patterns, some of the respondents kept exclaiming at how their livelihoods are affected by the political situation. This placed the researcher in the dilemma of having to explain all the time that the focus of this study was not the political

situation of the country. This was despite the fact that this has an effect on issues to deal with implementing any projects like IWRM. The researcher was therefore caught between whether or not to include some of the strong assertions by the respondents. Such statements have not been included in the analysis.

CHAPTER 4: RESEARCH FINDINGS

4.1 Introduction

This chapter describes and summarises the main results of the data collected. It combines the results collected from the informal interviews with the key informants and the data collected by questionnaires. The chapter presents the general set-up of the water management in the study area; with in and across the three villages in the study area. It covers aspects such as the livelihood strategies, the rules surrounding the water resources in the area, handling of offenders, dispute and conflict management, the roles and responsibilities of the various relevant authorities and the people's water resources conservation approaches.

However, the method of data collection was limited in that the researcher was not able to do a focused group discussion due to inadequacy in funds and time. This shortcoming spilled over to the analysis of the findings in that the researcher was unable to make any correlations between the household characteristics and some of the key findings on customary water management practices, like conflict management, handling of offenders, rain-making ceremonies and conservation measures.

4.2 Background information

This case revolved around a dam called Sibasa, which is a small multi-purpose dam. This small dam was constructed in 1954. It is perennially supplied the only source of water during the dry season. It is said to have survived the 1992 drought, the worst in living memory of Zimbabwe. The dam is presumably supplied by base flow, though this is yet to be confirmed through studies. Its overall management is under Chief Sibasa, who lives less than 2 kilometers away from the dam. The water in the dam is mainly used for domestic use and livestock watering. The water in the dam is reserved for the winter. During the rain season (summer), the water is used minimally for only domestic use by the people with in less than 4 kilometers around it. No livestock is allowed to drink from

this dam. During summer the livestock are watered from other dams like the Tekwani, Imvu, Sidleni, Kaba, Emganwini, Duze, Simezi and Mawela dams. These are approximately 6-10 kilometers away. In the dry season (during winter), the water in the dam is used only for domestic use and for livestock watering, while there is a nearby well used for domestic water. During winter, people bring their livestock from as far as 15 kilometers away to water their livestock.

The research was carried out in two wards, Ward 3 and Ward 11 transcending three villages Sibambaneni, Zenzele and Siyabalandela of the Insiza district. Sibambaneni and Zenzele fall in Ward 3 and Siyabalandela falls in Ward 11. The households sampled were all located in the communal lands; these mainly comprised of formal irrigation at the irrigation schemes, and informal irrigation, which is supplementary irrigation in form of small garden watering. The sample was made up of seventy-nine (79) households from different villages; 32% were from Sibambaneni, which is the community around the Sibasa dam, 33% from Siyabalandela, which is a formal irrigation based community and 35% from Zenzele. While more than 85% of the people in Siyabalandela practiced irrigation, this compared with only 28% and 17% in Sibambaneni and Zenzele, respectively. The villages were approximately within 8km of each other.

4.2.1 Ethnicity

In an effort to establish the ethnicity of the people in the study area, the respondents were asked what languages they currently spoke, and what languages their grandparents spoke (Table 4.1).

Table 4.1: Local languages spoken

	Village	Language			
		Ndebele	Shona	Tonga	Other
Language spoken by grand parents	Sibambaneni	96.0	4.0	0.0	0.0
	Zenzele	100.0	0.0	0.0	0.0
	Siyabalandela	96.1	0.0	0.0	3.8
Total		97.5	1.3	0.0	1.3

Language(s) spoken now	Sibambaneni	92.0	8.0	0.0	0.0
	Zenzele	92.9	7.1	0.0	0.0
	Siyabalandela	61.5	34.6	3.8	0.0
Total		82.3	16.4	1.3	0.0

Since the majority (more than 95%) of the respondents across the villages had their grandparents speaking *Ndebele*, it can be deduced that the people in this area are of *Ndebele* origin. However, Siyabalandela was noteworthy in that 35% had acquired *Shona* as their dialect. This could indicate a *Shona* influence in this village, which might have an impact on the water resources management practices in the area.

4.2.2 Major livelihood strategies

On average across the three villages, more than half of the respondents practised both livestock rearing and crop production, while 20% who practiced livestock production only with 17% practiced crop production only. Other sources of income at household level included casual labouring, trading (in vegetables and livestock), and remittances from employed relatives and informal employments from the cities. However, these were practiced by only 6% (Figure 4.1). Siyabalandela, the irrigation-based community, was significant in that it had the highest percentages of the people who practiced both crop and livestock production, and those who practiced trading. This could suggest that the people engaging in irrigation produced enough to trade off and therefore improved their livelihoods.

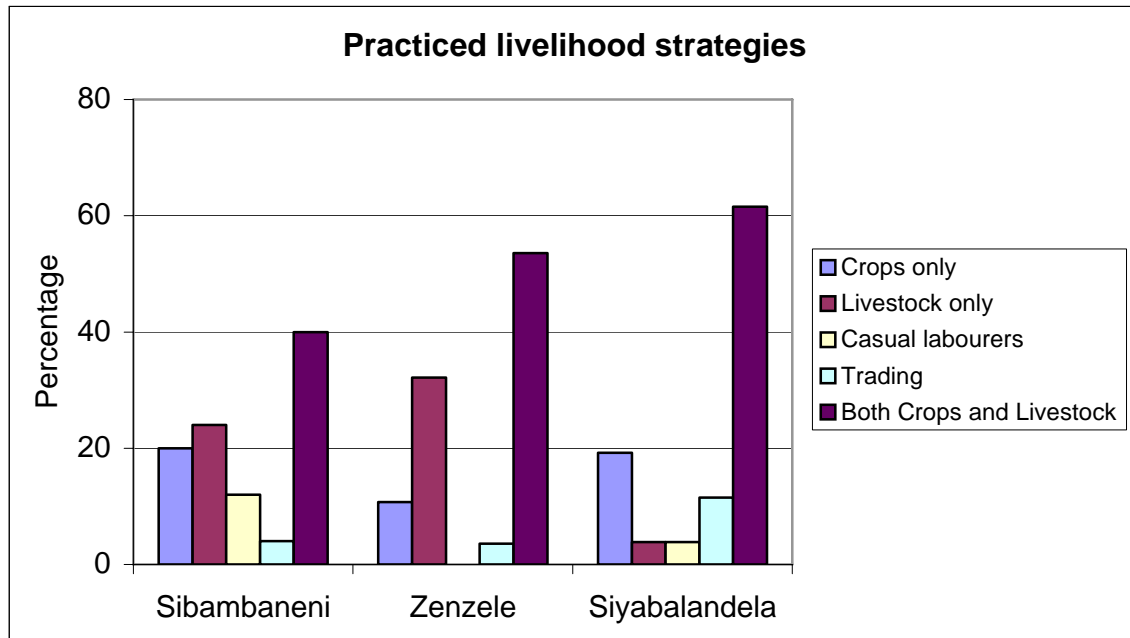


Figure 4.1: Various livelihood strategies practised across the villages

The respondents were asked what type of agriculture they practiced. Figure 4.2 shows that the most practiced type of agriculture was rain-fed agriculture across the villages (51% of the respondents). Only 8% practiced only irrigated agriculture.

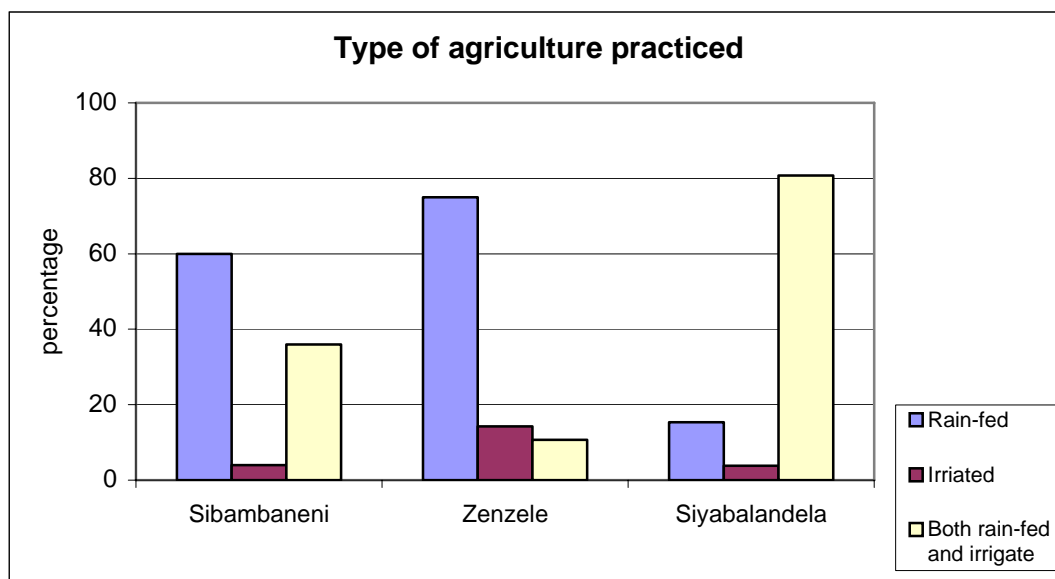


Figure 4.2: Type of agriculture practiced.

While Siyabalandela was renowned for irrigation, Figure 4.2 shows that the most practiced type of agriculture was both rain-fed and irrigated. This means that the majority of the people who had plots in the irrigation scheme still engaged in rain-fed agriculture. This could be because they try to minimise on their expenditure on water by practicing rain-fed agriculture during the summer season, though it could be that irrigation only was not dependable/reliable.

75% of respondents across the villages said they produced enough for the whole family all year round. In Sibambaneni, the village around Sibasa dam, 40% of households were not able to produce enough food for all the members of the household all year round. This could be because the people in these villages relied on rain-fed agriculture and small gardens for crop production, and these happened to be seasonal. It could also be due to the fact that this village had the least number of people with access to small gardens. However, in Zenzele, and in Siyabalandela, the majority of the people (more than 70%) were able to produce enough food for their household members all year round. The reasons given across the villages for the failure to produce enough food included poor rainfall pattern, poor soils and lack of enough draught power. People claimed that they did not have enough money to afford the inputs to revert the poor soils. Other minor reasons cited for failure to produce enough food for their households included old age and sickness.

The respondents were asked whether they got enough income to sustain their households to afford them the basics of life; food, shelter, clothing and education. Across all three villages, a total of 75% of the respondents said they got enough income to sustain their livelihoods. In Zenzele 57% of the people had enough income to sustain their household members. This compared with 90% in Siyabalandela. However, the majority of households in Sibambaneni (64%) lacked enough income to sustain their households. This could imply that the people practicing irrigation got more income than those people who did not practice irrigation. The major reasons cited for failure to get enough income to sustain their households was poor erratic rains (and thus lack of enough water resources for agricultural produce). In addition, the market was limited and the in-puts for

crop and livestock production were expensive. Those respondents whose major source of livelihood was casual labouring, claimed that they were paid little money.

4.3 Description of Water Resources

4.3.1 Rainfall and water availability

The majority of the respondents (more than 75%) across all three villages said that the rainfall pattern of the area was irregular (Figure 4.3).

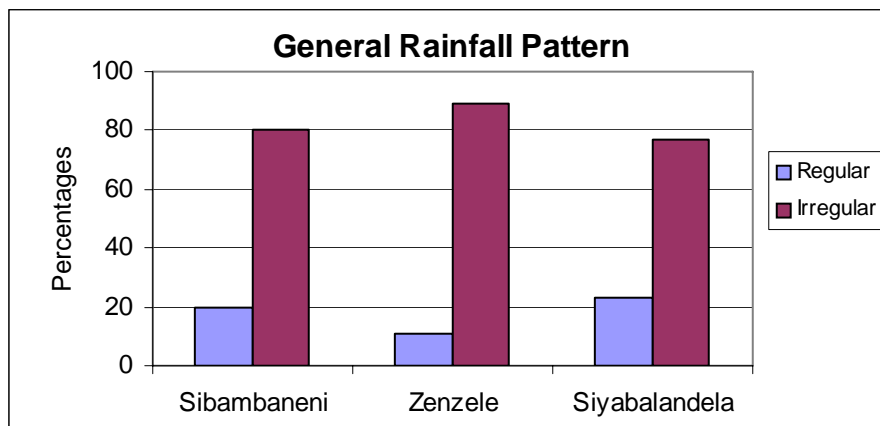


Figure 4.3: The general rainfall pattern.

Informal interviews with the key informants revealed that the rainfall pattern across the three villages was very irregular in terms of amount and timing. While the rain still came at the same time of the year, citing October to February, its variability within this season was very high and unpredictable. The amount of rain was said to be gradually decreasing in the past ten years. The current year had received the least amount in the past ten years. This could be the reason why most people were abandoning rain-fed agriculture to take up irrigation, or rely solely on livestock production.

When asked about the general availability of the water resources in the area, the majority of the respondents (more than 80%) alleged that the water resources in the area were scarce (Figure 4.4), which can be seen as a direct consequence of erratic rainfalls. The lack of larger dams to trap enough runoff during the rain season could be another factor.

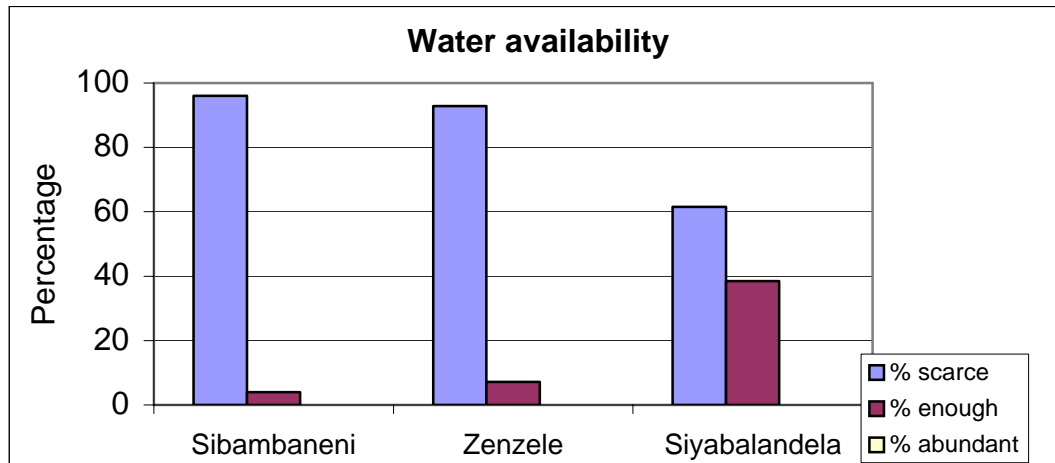


Figure 4.4: Water availability across the villages.

Figure 4.4 shows that water resources were scarce in all the three villages, with Sibambaneni having the highest level of scarcity as shown by 96% of the respondents. This was despite the fact that this village was located near the Sibasa dam. This could be ascribed to the fact that Sibasa dam is a small dam, which capable of catering majorly for livestock watering and domestic use, and not for irrigation. However, 39% of the respondents from Siyabalandela alleged that the water resources were enough. This might be because this study was done in summer, which is the rainy season, giving the implication that the water resources were enough, or due to the fact that the village lies along the Mzingwane River.

The majority of the respondents (more than 95%) said this water scarcity resulted in crop failure, especially in the current year. Also due to increased rainfall insufficiency, crop germination was poor, and certain crop diseases increased. This translated to poor harvests at the end of the season. On the effect of water scarcity on livestock, 84% respondents revealed that their livestock failed while 16% took their livestock (especially cattle) to other places, where there was more pasture. Informal interviews with key informants revealed that there used to be government-reserved areas (about 5 years ago) where people could take their livestock during the drought season. This facility no longer existed due to unknown reason. As a result, some of the people now took their livestock

to relatives and friends in Gwanda, which is the neighbouring district (about 100kms away), and did not usually experience acute shortage of pasture.

4.3.2 Sources of water

In an effort to understand the association between the people and their water resources, and the livelihood strategies practiced, the respondents were asked about their sources of water for the various water uses, the proximity of these water sources and their reliability. Proximity of water source in this context refers to the distance, in kilometres, of the water source from the particular household. The reliability of a water source in this context is taken to mean how dependable the water source for that particular water use is; that is the ability of the water source to provide water for a given year.

All the interviewed 79 respondents used water for domestic purposes, that is, for drinking, cooking and washing, 89% of the respondents used water for livestock watering, 37% households use water for small garden watering, 39% households use water for irrigation, and 41% households used water for brick making. While the majority of the people in Siyabalandela (more than 85%) practised irrigated agriculture, the majority of the people in Zenzele had the most number of people relying on small gardens for food production. The major sources of water for the different water uses explored in this study differ as presented in figures 4.5 to 4.8.

Domestic use

Water for domestic use refers to water used for drinking, cooking and washing. The findings show that the borehole was the most popular water source for domestic water use across all three villages (Figure 4.5).

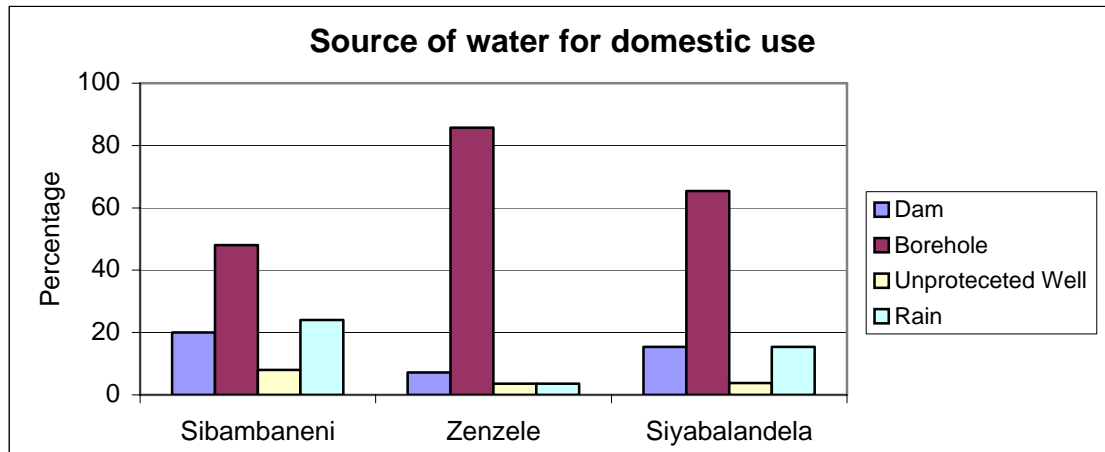


Figure 4.5: Water sources for domestic water use.

The respondents were asked about the proximity of their water for domestic use. For 47% of the respondents across all three villages, water for domestic use was within 1 km, while for 35%, it was within 1-3 km. Comparing this with the WHO recommendations, it is realised that 47% had basic domestic water access, while 53% (those having it beyond 1km), has poor access (WHO, 2005). Zenzele was significant in that almost 35% of the people had their source for domestic use, which is the borehole, to be within 3 and 6 kilometers away. This could mean that either there are less boreholes in this village, or that the boreholes were situated at a longer distance from the people.

When asked about the reliability of their water sources for domestic water, the respondents said that generally for more than 85% of the people across all three villages, water for domestic use, was available all year round. Since the major source of water for domestic use was the borehole, it can be deduced that water from the boreholes was available all year round. Some of the respondents said the reliability of their water for domestic use depends on 'other'; implying that it depends on the functioning of the boreholes because the boreholes were sometimes broken down. In such cases they had to resort to other sources like the dam.

Livestock watering

Through out the three villages, the dam was the major source of water for livestock watering (Figure 4.6). This could be because water from the borehole was given to domestic use as the primary use since it is safe water. This left the dams as the most reliable water source for livestock watering. However, other popular sources of water for livestock watering include unprotected wells, rain and borehole.

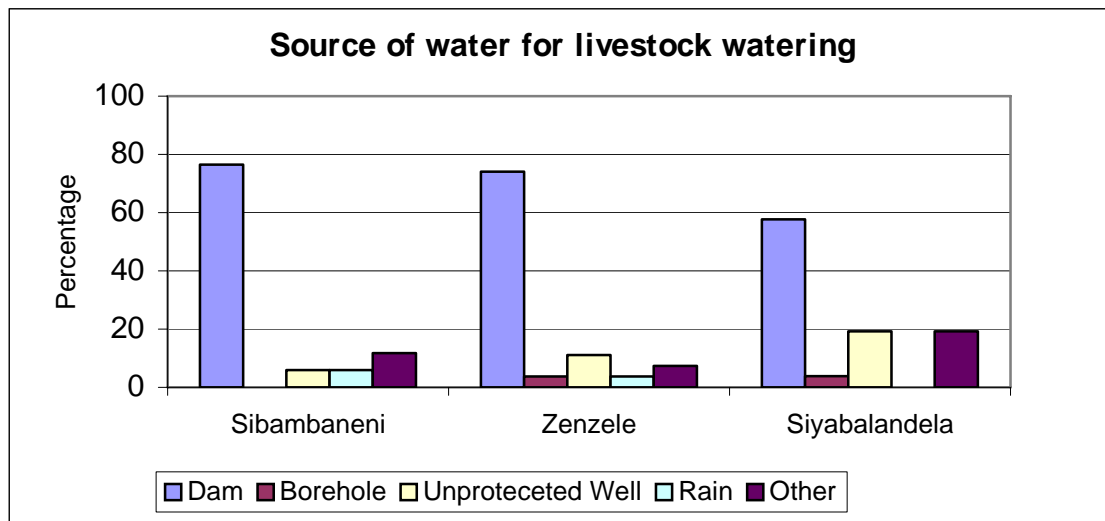


Figure 4.6: Source of water for livestock watering.

The responses of the household heads showed that generally for more than 70% of the people across all three villages, water for livestock watering was available all year round. Since the major source of water for livestock watering was the various dams, it can be deduced that water from the dams was available all year round. Interviews with key informants revealed that for most of the small dams in this area, water was available most of the year. However these tended to dry up towards the end of the winter season, depending on the amount of rainfall received in the previous summer. As a result, the people across the two wards resorted to Sibasa dam for livestock watering in the dry season. The Sibasa dam had not dried up in the past 10 years. This dam was presumably served by base flow. This could explain why the water in this dam was reserved in summer for later use in the winter season when most of the dams and all of the unprotected wells have dried up. This availability of water for livestock watering during

the dry season could be one of the reasons why people have currently been taking up more of livestock production and abandoning rain-fed agriculture.

Irrigation

Irrigation in the context of this study has two aspects; the irrigation of the small gardens, which were mostly nutritional gardens, and the formal irrigation at the irrigation scheme; the Silalabuhwa Irrigation scheme.

Small gardens: Across the three villages, unprotected wells are the most popular source of water for water for small garden watering (Figure 4.7).

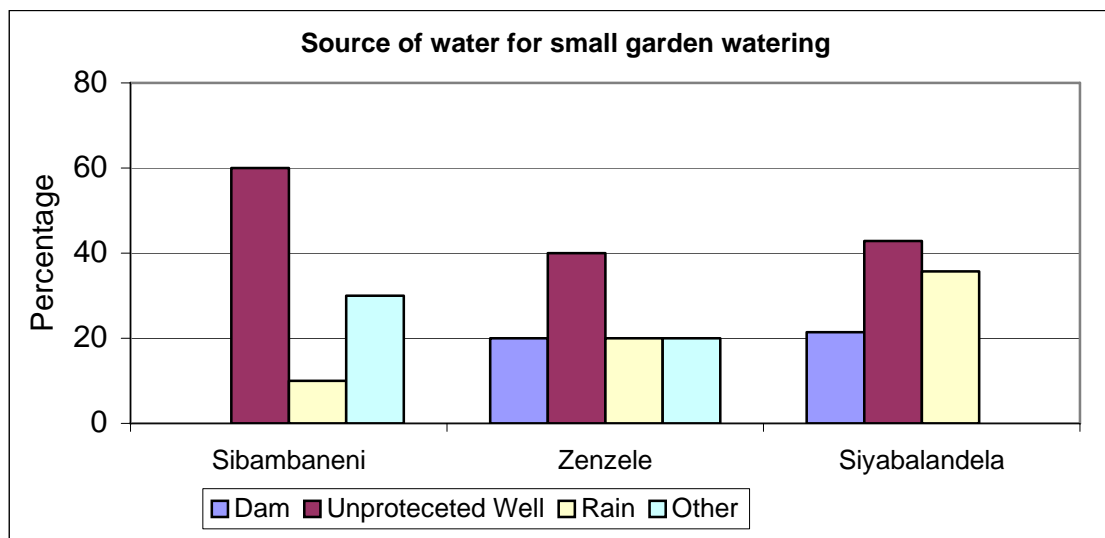


Figure 4.7: Source of water for small garden watering.

On the proximity of water for livestock watering, 80% of the respondents across the three villages said the water source was less than 1 km. However, Sibambaneni stands out in that for all the respondents in this community - the water source for small garden watering was within 1 km. This could be because the unprotected wells, which were the major source of water for small garden watering, were dug by individuals, with in their own convenience.

For more than 60% of the people, the water for small garden watering was available for mostly six months. The unprotected wells, being the major source of water for both small garden watering depend on the rainy season, and are thus only reliable during the summer season, when the runoff is abundant, and water table is still high.

Formal irrigation scheme: All the respondents who used water for irrigation at the scheme got their water for irrigation from the dam. These were asked about the proximity of their water for irrigation, and the majority (more than 65%) responded to having the water source less than 3 km from their household, while the rest 35% have it more than 6 km away. Informal interviews with key informants from AREX revealed that source of water for irrigation is the overnight storage dam, which is between 0 and 3 km from most of the respondents' households, but this water is obtained from the big dam, Silalabuhwa, which is about 11 km away.

For more than 85% of the respondents across all three villages, water for irrigation was available for only eight months, saying that mostly towards the end of the winter season, the water is rationed. Interviews with the AREX officials revealed that the water is rationed by the irrigation department under the ministry of agriculture, once the dam level at Silalabuhwa has fallen below 45%. Thus water for irrigation being available even during the dry could be the reason why most people were taking up irrigation, while others were abandoning rain-fed agriculture.

Brick making

Unprotected wells were said to be the major source of water for brick making, followed by the rain, and the borehole (Figure 4.8). Other sources of water for brick making included streams, rivers and pools of water after heavy rains. Interviews with the key informants showed that the unprotected wells were usually dug by individuals, especially during summer when there was plenty of rain; people dug wells where there is a lot of run-off in the alluvial soils, or where the water table is high during the rainy season.

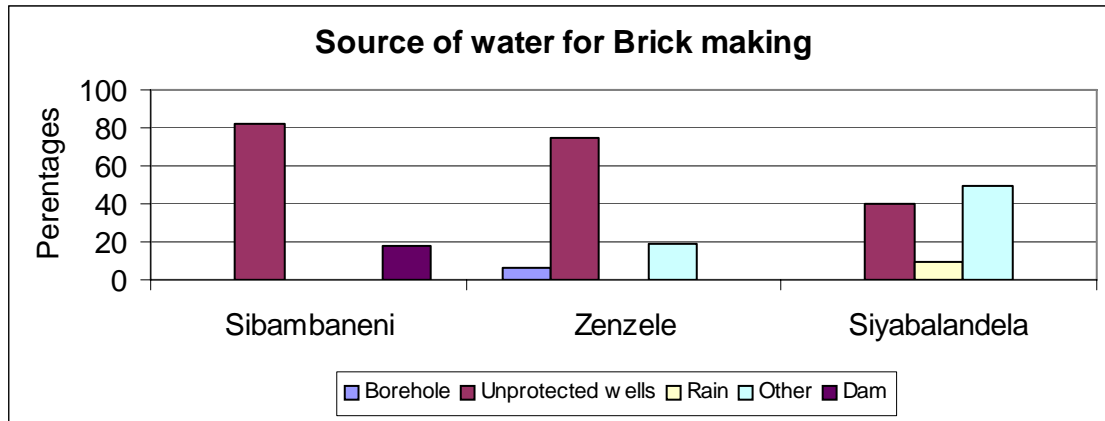


Figure 4.8: Source of water for brick making.

This situation of proximity of water source for small garden watering was similar to the water source for brick making whereby 78% of the respondents across the three villages had the water source with in 1km. This is because unprotected wells, being the major source of water for brick making, can be drilled by anyone and anywhere for one’s convenience, since there is no law about digging of these wells. While Sibambaneni and Zenzele had more than 80% of the respondents having their water source for brick making with in 1km away, Siyabalandela had half of the respondents having the source of water for brick making within 1 – 3 km ways and the other half had it between 3 and 6 kilometers away. This could be because while the major source of water for brick making for Sibambaneni and Zenzele was the unprotected wells that can be dug anywhere, within the individuals’ convenience, for Siyabalandela, it was the rivers and springs, which are naturally occurring.

More than 20% of the respondents said that water for brick-making was available for six months, while 60% said it was available for only three months. The unprotected wells, springs and rivers being the common sources of water for small garden watering depend on the reliability and amount of the rainfall, received in a given rainy season. This also includes the pools of water immediately after the rainfall, which was one of the water sources for brick-making.

4.4 Water Access

‘Water access’ in this context refers to the opportunity or right to experience or make use of the water resources. This refers to the social interactions between the people and their water resource. It refers to any requirements necessary to use the water, the rules surrounding the water resources, the authorities responsible for setting up these rules, the authorities responsible for designating particular areas and the punishment of culprits caught breaking these rules.

The previous sub-sections delved into the variations within the villages, and have revealed that there are no focal differences between the villages. This section explores the general scenarios across the three villages, with less examination of the variations between the villages.

In an attempt to understand the water management in this area, the respondents were asked about the rules pertaining their water resources, the relevant authorities concerning their water resources and the roles of these authorities, penalties and water allocation issues. The findings are presented in this sub-section.

4.4.1 Main institutional actors

Traditional leaders

The traditional hierarchy concerning water management comprised the chief being at the top of the tree; below him is the headman, then the village head. There used to be the kraal head below the village head, but at the time this study was carried out, this had been scrapped due to unknown reasons. The spirit medium was another traditional leader who is solely responsible for communicating with the ancestors, especially for rain-making purposes. The Chief is the head of all the traditional leaders, but in cases where the chief is too far from some villages, a headman is put in position to be the immediate substitute for the chief. However, if the headman fails to handle some issues, he can then pass them on to the chief. The village head handles matters at village level, which entails individual households, while the kraal head used to be responsible for 5-7 households, but this

position was scraped since about four years ago. Table 4.2 below gives the detailed roles of the traditional leaders as regards the water resources, but is not exhaustive

Table 4.2: Functions and roles of the traditional leaders with regards to the water resources

Category	Functions and Roles
Chief	<ul style="list-style-type: none"> -Overseeing all issues concerning water -Citing of dams -Ensuring availability of water to everyone, through planning for the water resources -Advising the people not to pollute the water -Requesting for more water sources like boreholes, piped water -Managing conflicts and disputes -Informing people about the date for the rainmaking -Warning and punishing culprits caught breaking the rules -Ensuring maintenance and protection of the water sources -Setting bi-laws of water sources, enforces them -Advising on Catchment protection and conservation approaches -Supervising the headmen village heads, kraal heads and spirit media
Headman	<ul style="list-style-type: none"> -Substitutes for the Chief / Acts as the Chief where chief is far (about 15kilometers away) -Ensure maintenance and protection of the water resources -Plan for new sites for dams or boreholes
Village head	<ul style="list-style-type: none"> -Ensuring peace in times of conflicts; ‘ensure that people do not fight at the boreholes’ -Ensuring water that water is not polluted -Maintaining and protecting the water resources -Setting bi-laws for the water sources, together with the chief, and enforces them -Taking issues up to the chief or headman -Identifying the areas of the water resources that need to be developed

	and how they can be developed -Reporting dried-up boreholes, or those with a low yield to the chief
Kraal head	-Same as the village head (but catering for about 5-7 households)
Spirit medium	-Predicting rain - Leading the team going to Njelele for the rain making ceremony

Source: Field data.

While 20% of the respondents were not sure whether there are any clashes among the roles of the traditional leaders, the majority of the respondents (79%) were either not aware of any clashes, or claim that such clashes did not exist among the roles of the traditional leaders. However, while discussing with the key informants. The researcher discovered that there were no clashes among the roles of the traditional leaders, and they attributed this to the nature of the hierarchy and also to the fact that all the leaders knew their roles; the village head focuses on issues at village level, should he fail to resolve them, he will then pass them on to the higher authority; the headman or chief.

An average of 75% of the respondents across all three villages were aware that the traditional leaders were paid to do their roles, while the rest of the respondents were not sure whether the traditional leaders were paid. Through discussions with the respondents, the researcher found out that the chiefs and the government paid headmen, while the village head was paid by the government and sometimes with fees from the people. The spirit media were paid only occasionally from the fees contributed by the villagers. This is approximately once a year when there is need for conducting the rain-making ceremony.

Other relevant officials

The other relevant authorities mentioned with regards to water resources during the interviews were the ward councilors, village health workers (VHW) and the AREX officials. The ward councilors are not involved in the day-to-day management of the water resources. They occasionally may get involved when there was a new project like a pipeline or a new borehole or new dam being offered by the government. Their role as

regards water resources management also included, to a certain extent, to report issues like any need for development of the water resources to the government; this could be the need of a new dam or borehole or the site for a new borehole. The councilors may also intervene in solving some extreme conflicts, but this is only at the invitation of the chief. The role played by the village health workers was as previously mentioned; to ensure that the water quality of the dam and the boreholes is good for consumption, and is thus good for people's health. The role of the AREX officials was focused in the irrigation scheme where their basic role was to help the irrigators in agricultural issues, among which include good soil water conservation practices.

4.4.2 Rules governing the water resources

The respondents were asked if they were aware of any rules pertaining to their water resources, that is, rules pertaining to access, abstraction and use of their water resources. Table 4.3 is a cross tabulation of their responses with the various water uses in the study area.

Table 4.3: Knowledge of rules pertaining the water resources according to the various uses

Water use	Existence of rules pertaining access, use and abstraction of water	
	Yes (%)	No (%)
Domestic	65.8	34.2
Livestock watering	64.3	35.7
Small garden watering	28.6	71.4
Irrigation	87.1	12.9
Brick making	15.6	84.4

From Table 4.3, it is observed that more than 65% of the respondents across the three villages were aware of the rules pertaining the water for domestic use. Such rules included; no one is denied water for domestic use, everyone must be allowed to access water for domestic use, everyone is supposed to pay fees for repairs in case of any

necessary repairs and everyone has to be involved in cleaning around the water source, except the elderly.

Of the respondents who used water for livestock watering, almost 65% were aware of the rules pertaining water for livestock watering. These rules basically centred on the dams, which are the major source of water for livestock watering. These rules included; no fishing with boats or nets is allowed on the dams, washing directly in the dam is prohibited, no livestock watering allowed at the Sibasa dam during summer, no use of scotch carts and drums on the Sibasa dam, 'because you will finish water for the others, especially during the dry season.'. Livestock is not allowed to drink directly from the dam; they have drink at certain designated points. Livestock are not allowed beyond the barbed wire fence around the dams.

More than 70% of the respondents who used water for small water gardening were not aware of any rules pertaining to small garden watering. This could mean that either such rules did not exist, or the respondents were not aware of these rules. However, the informal interviews with key informants exposed that such rules existed and they included; no fetching water for small garden watering from the borehole, and no one is allowed to get water from a neighbour's well without permission. Since the major source of water for small garden watering was unprotected wells, which were dug by individuals, this could explain the ignorance about these rules. This is because it is not easy to realize the existence of any society rules pertaining such 'privately owned' water sources. This was the same scenario for rules pertaining water for brick making. The majority (more than 84%) of the people were not aware of any rules pertaining water use for brick making. Rules pertaining water for brick making included; no fetching water for brick making from the borehole, no one is allowed to get water from a neighbour's well without permission, and if water is scarce, people are ordered to leave it for animals.

Table 4.3, shows that the majority (more than 85%) of the people who practiced formal irrigation were aware of the rules pertaining the access, abstraction and use of water for irrigation. These rules included; farmers should not waste water, otherwise they will be

fined, the water supply has to follow the irrigation programmes, water should be used only for irrigation and drinking, to get water, one has to be a paid up member or else they don't get any water at all, and lastly, ZINWA rations water especially when water in the main dam falls below 45%.

Across all the three villages, the majority of more than 85% of the people said they paid fees to access water for the various water uses, although the majority of them continuously said they were not sure why and what they were paying for. Informal interviews with the key informants revealed that people only paid fees in form of contributions for the repair of infrastructure. Common instances requiring such contributions included repair of boreholes, and when there was need to send the spirit medium to go and make consultations about rainmaking. Those people who did not pay these fees accordingly were repeatedly warned and finally punished. The 14 % that said they did not pay any fees could refer to the culprits that did not usually pay contributions as required.

Designation of specific areas around water resources

The respondents were asked about who was responsible for designating specific areas for various activities like washing, watering of animals and drawing of drinking water, their responses are presented in table 4.4.

Table 4.4: Authority for designating specific areas for washing, watering of animals, drawing of drinking water

Authority for designating specific areas	Frequency	Percentage
Government officials	1	1.3
Traditional leaders	33	41.8
Water Point Committee	12	15.2
Neighborhood police	4	5.0
The Community	29	36.7
Total	79	100.0

Traditional leaders and the community were responsible for designating areas for washing, watering of livestock and drawing of drinking water, together with the water point committee (WPC). The Water Point Committee was set up by the water users in the village; it was made up of approximately five people, and its role included discussing issues concerning management of the water resources and to sometimes come up with punishments for the culprits. The neighbourhood police was also said to be involved in this process because it is their responsibility to identify the culprits, thus they have to be fully aware of the boundaries of such designated areas.

Penalty for offenders

The respondents were asked what punishment is given to those people caught breaking the rules, or to those who failed to contribute towards any matter as required (Table 4.5).

Table 4.5: Punishment of offenders

Punishment	Polluters (%)	Non-contributors (%)
Fined	75.9	70.9
Denied access to water	1.3	10.1
Warned	21.5	15.2
Not punished	1.3	3.8
Total	100	100

Table 4.5 shows that the punishment for any people who are caught polluting the water and those who fail to contribute as required is fining. This fine could be a goat, or some money, which one of the respondents said is Z \$ 20,000 (twenty thousand Zimbabwean dollars). While the researcher was administering the questionnaires, the respondents revealed that such cases were quite common. The researcher came across a certain gentleman who had been fined for letting his cows drink directly in the dam. This gentleman informed the researcher that he was fined a goat, and although he did not rare

any goats in his household, he had to buy it and give it to the chief. While another such offender revealed that he was asked to bring the money equivalence of the goat that he had been fined. Such goats got from fining people are slaughtered and the meat is shared amongst the villagers, while the money is kept for maintenance purposes, and maybe used to pay the village head and the spirit medium.

Table 4.5 also reveals that the offenders are also continually warned (15%), while the least percentage said the offenders were sometimes went scot-free. This shows that the rules governing the water resources are flexible and open to negotiation. Interviews with key informants revealed that once the neighbourhood police or the community members identify a culprit, the village head is informed. It is the duty of the village head to warn this culprit and if this culprit does not heed, the village head will either fine the individual or take up the issue through the traditional hierarchy.

Water allocation

Informal interviews with key informants revealed that there were no set rules for water allocation. This was confirmed by the majority of household heads (95%) who said that everyone was allowed to access as much water as they needed as long as the water resources were available. However, in times of scarcity, the village head, together with the people ensured that each household got some water (usually from the boreholes). Since people are free to access as much water as they need, even for food production, this means that the water management in this context is sustainable as regards food production. However, water becomes the limiting factor during the dry season (winter time).

The respondents were asked how they prioritised water especially in times of scarcity, and the majority (more than 90%) across all the villages revealed that they gave the first priority to water for domestic use, that is drinking, washing and cooking, followed by water for livestock watering and then water for small gardens. The key informants also revealed that across all the three villages, no one was given priority to water access in times of water scarcity. Responses from the household heads showed that in times of

water scarcity, everyone was given an equal opportunity to get water. In cases of extreme shortage, the village head had to ensure that at least each household got some water. However, some of the respondents said that in times of scarcity, the first priority was given to community and livestock watering, and people were ordered by the chief and village head to suspend all other activities that were water demanding. It is the duty of the village head to ensure that people comply with the chief's instructions.

The respondents were asked if there were cases when people were denied access to water, and the majority (more than 90%) said that no one was denied access to water. The interviews with the key informants exposed that sometimes, people were denied access to water when they repeatedly failed to pay fees for repairing the borehole, and when they were caught fetching water for brick making from the borehole. When individuals repeatedly failed to pay fees for repairing the borehole, they were denied water from the borehole. As a result, they have to resort to other sources the dams or unprotected wells. These key informants stressed that however, no one was denied water for domestic use, saying that water is a basic right and should never be denied from anyone.

The respondents were asked who was responsible for setting up the rules and regulations pertaining to the access, abstraction and use of water for the various uses. Their responses are presented in table 4.6.

Table 4.6: Authorities responsible for setting up the rules and regulations

Authority for setting rules	Domestic (%)	Livestock watering (%)	Small garden watering (%)	Irrigation (%)	Brick making (%)
Community	1.9	42.2	25.0	0.0	20.0
Traditional leaders	51.9	28.9	37.5	0.0	40.0
Councilors	0.0	0.0	0.0	0.0	0.0
Other	1.9	2.2	0.0	92.6	0.0
Both Traditional leaders and the community	44.2	26.7	37.5	7.4	40.0

From table 4.6, it is observed that across the three villages, the rules pertaining to the water resources were basically set-up by both the traditional leaders and the community, and that the councillor was not involved at all. This is in conformity with what the key informants revealed. This also implies that the traditional leaders, together with the community set-up the rules pertaining the dams, boreholes and the unprotected wells. The key informants exposed that these rules pertaining the water resources were customary. That is to say that these rules were set-up from the rules that have existed since time immemorial, and had been set-up by the ancestral traditional leaders, who had done this together with the community. Thus these rules had existed for long, they are not written, but everyone was aware of them. It is worthy to note from table 4.6, the rules pertaining water for irrigation were set-up by 'other' authorities, which included ZINWA, the irrigation department from the ministry of agriculture, and AREX officials.

4.5 Rain-making Ceremonies

Across the three villages an average of 81% said they had had rain-making ceremonies in the past five years. Interviews with key informants revealed that the chief used to organise the rain-making ceremonies, across all three villages. Sibambaneni was noteworthy; 100% of the respondents affirmed having had rain-making ceremonies. This means that the people in village, which the chief lived, participated fully in the ceremony. The chief called upon all people in his area of jurisdiction to participate. The spirit medium, popularly known as '*wosana*', led a team of four to six elders to Njelele shrine in Matopos, for consultations. This was usually around September or October. On return, they gathered all the people, went to the hills for the ceremony which went on for the whole day and night. They brewed beer, the women played drums, people sang and performed traditional dances. The people moved around the bush collecting all sorts of rubbish that might be hanging around and buried it, even the dead carcasses. The spirit medium also informed people to stop burning grass and cutting trees. On scrutiny of such a ceremony, one realises that it is has more connotation than its face value. It is a form of social-organisation, which brings the water users together to discuss and do things together, easing decision-making, especially on matters concerning natural resources like

water. It might also be a way of preserving the cultural values of the people, and to strengthen their loyalty to the traditional leaders.

4.6 Management of infrastructure

The respondents were asked about the authorities responsible for the management of their dams and boreholes; that is, the responsibility of the day-to-day operation, maintenance, ensuring that the water quality is good, and management of conflicts, with regards to the dams and the boreholes. The responses are presented in the tables 4.7 and 4.8.

Table 4.7: Responsibility of management of the dams

Responsible Authority	Day-to-day operation (%)	Maintenance of infrastructure (%)	Ensuring good water quality (%)	Managing conflicts (%)
Traditional leaders	20.0	17.7	23.1	60.8
Councilor	0.0	3.8	0.0	2.5
Neighbourhood police	27.8	0.0	20.0	0.0
Community	49.4	67.1	10.1	31.6
Other	3.8	11.4	46.8	5.1
Total	100.0	100.0	100.0	100.0

Table 4.7 shows that the day-to-day management of the dam is majorly by the community, who work together with the neighbourhood police and the traditional leaders. While the day-to-day operation of the dam is the responsibility of the community, the neighbourhood police ensures that all culprits caught breaking the rules are taken to the village head, which deals with them accordingly. The community has the responsibility of keeping to the good side of the law. This includes ensuring that they do not wash directly in the dams, or to fish with a net in the dams, ensuring that their livestock do not drink at the Sibasa dam during summer, and abstaining from using scotch carts and drums to fetch water from the Sibasa dam.

Interviews with key informants informed that while it was the role of the Village Health Worker (VHW) to ensure that the water quality of the dam is good, it was the responsibility of the neighbourhood police, the community and the traditional leaders to watch out for anyone polluting the water. The neighbourhood police also watch out for people washing their clothes with in 50 meters of the water source and any livestock getting within 20 meters of the water sources (dams). The neighbourhood police were chosen by the people, and are voluntary (not paid any salary). The maintenance of the infrastructure is majorly the responsibility of the community; this includes, among others, scooping silt from the silt traps, removal of vegetation around the dam wall. However, in other cases like when the dam wall needs to be repaired, it is the responsibility of the traditional leaders to report this to the relevant authorities, which include the government and DDF. It is the responsibility of the councillor, through the village health worker to ensure that the water quality is good, while the neighbourhood police and the traditional leaders have to ensure that no one pollutes the water. Management of conflicts is the responsibility of the traditional leaders who work together with the community.

Table 4.8: Responsibility management of the boreholes

Responsible Authority	Day-to-day operation (%)	Maintenance of infrastructure (%)	Ensuring good water quality (%)	Managing conflicts (%)
Traditional leaders	14.3	6.3	3.8	62.0
Councilor	1.3	6.3	0.0	1.3
Neighbourhood police	21.5	3.8	7.5	0.0
Community	60.8	43.0	21.5	34.2
Other	1.3	40.5	67.1	2.5
Total	100	100	100	100

Similarly, the community has the major responsibility of managing the day-to-day operation of the boreholes, followed by the neighbourhood police and then the traditional leaders. It is the duty of the community to clean around the boreholes, to ensure that their livestock do not drink directly in the dams and canals, and to ensure that their livestock do not drink at Sibasa dam during the summer season. The role of the neighbourhood police is to ensure that any person(s) caught not heeding the rules is warned or taken to the village head for questioning. Table 4.8 also shows that it is the responsibility of the community to maintain the infrastructure of the borehole, together with DDF. While the traditional leaders report any breakdowns or necessary repairs to the trained personnel like DDF, the community has to contribute money to pay for these repairs. The management of conflicts concerning the dam is by the traditional leader; once the neighbourhood police report some conflicts or culprits to the village head, he will try to sort the issues out, should he fail, he may then pass the issues on to the chief or headman.

During the administering of the questionnaires, the researcher discovered that the management of the unprotected wells was exclusively by the individuals or groups of individuals who own them. Its only when disputes or conflicts arise that the village head and maybe the chief or headman get to be involved. Informal interviews with the key informants also revealed that the councillors only get involved in the management of dams and boreholes when there is any need for external funding.

4.7 Conservation of Water Resources

The respondents were asked if they carry out any conservation measures as regards their water resources. Some villages have 'No-cutting-trees' campaigns, and tree-planting campaigns. The village head ensures that people do not cut down trees. For villages, like Sibambaneni had silt traps to prevent siltation of the dam. While the government set these up, it was the responsibility of the community to manage them. The community has the responsibility of continuously scooping silt from the silt traps. When asked about any water conservation methods used in their crop production, the respondents mentioned that they used mulching to conserve the soil moisture, prevent soil erosion through the use of

contours and also plant sisal along the gardens to prevent sand from moving into the dam. The respondents also revealed the use of fertilizers was not limited, even people were not aware that too much fertilizer might pollute the water for the downstream users. The villagers said they were also involved in putting stones on points where rivers and streams serve the dams to prevent the sand from getting into the dam. Thus there are no Catchment protection measures.

4.8 Conflict Management

A conflict in the context of this study is taken to mean a clash between two or more parties, a dispute in this context is taken to refer to a minor misunderstanding between two or more parties, for example, competition for water between different water users. A conflict is a higher level than a dispute; disputes in this context are taken to be misunderstandings at village level while conflicts may involve parties from different villages, or different wards, or even different districts. The respondents were asked about which authorities were responsible for handling matters concerning competition over water resources in their respective villages, especially during times of water scarcity (Table 4.9).

Table 4.9: Authority for handling disputes concerning competition over water resources

Authority for handling competition over water resources	Traditional leaders	Councilors	Both Traditional leaders and the community	Other
Sibambaneni	52.0	0.0	44.0	4.0
Zenzele	53.6	0.0	44.4	0.0
Siyabalandela	46.2	3.8	50.0	0.0

During the informal interviews with key informants, the researcher discovered that competition over water resources was rare, but in cases where it happens, the traditional

leaders together with the community handled these issues. The Chief calls a meeting and they discuss how to go about such issues. This process is only between the traditional leaders and the community, the councillor may attend as part of the community, but has no say in the decision making in his capacity as ‘the councillor’. This was in conformity with the responses from the household heads across all three villages, of which more than 95% said that both the traditional leaders and the community handle the disputes. However, the councillor may be called upon when there are disputes between the water suppliers and the irrigators at the irrigation scheme. One of the most common disputes cited was when individuals are caught collecting water from other people’s wells without permission.

The respondents were asked about the relevant authorities for managing conflicts concerning their water resources according to the various water uses. The results are presented in the table 4.10.

Table 4.10: Authority responsible for settling conflicts concerning water resources

Authority for settling water conflicts	Domestic (%)	Livestock watering (%)	Small garden watering (%)	Irrigation (%)	Brick making (%)
Traditional leaders	59.5	32.9	31.0	16.1	56.6
Councillors	0.0	0.0	0.0	6.5	0.0
Community	17.7	22.9	20.7	0.0	34.4
Other	1.3	12.9	0.0	77.4	0.0
Both Traditional leaders and the community	21.5	31.4	48.3	0.0	9.4

From table 4.10, it is observed that both the traditional leaders and the community were the major authorities involved in the management of conflicts concerning domestic water, water for livestock watering, water for small garden watering and water for brick making, while the councillors were not involved at all. The case of water for irrigation is different

in that the management of conflicts was majorly by the irrigation committee, and to a certain extent by the traditional leaders. The key informants exposed that conflicts over the water resources were not common, but once there was a conflict, the village head would try to solve it, but if he failed, he then took it to the chief or headman. The chief then tried to solve it between him and the village head, with the concerned parties. However, in cases where the conflicts were complex, and involving a big part of the community, then the rest of the community was called to witness and assist in solving the conflict. Some of the respondents mentioned that the commonest conflicts were usually over the unprotected wells, where people try to fetch water from their neighbour's wells without permission.

From some of the respondents' narratives, the researcher gathered that when the chief decides to involve the community in solving a conflict, they gather in the village court, which is a building near the chief's residence. The chief together with the village head chaired the village court. This situation was not a common occurrence, but as one of the respondents revealed, happened averagely once a year. One of the common conflicts mentioned was when invasion of people's livestock from other wards during the droughts.

4.9 Attempts To Introduce Integrated Water Resources Management

In an effort to establish the extent of launching of IWRM in this area, the respondents were asked about their knowledge of the newly introduced IWRM-driven methods of water management. They were asked whether they had heard of ZINWA or met someone from there, whether they had heard of the new institutions of water resources management, the catchment councils (CCs) and the sub catchment councils (SCCs). The respondents were also asked about their knowledge of the new Water Act of 1998. Their responses across all three villages are presented in the figure 4.9.

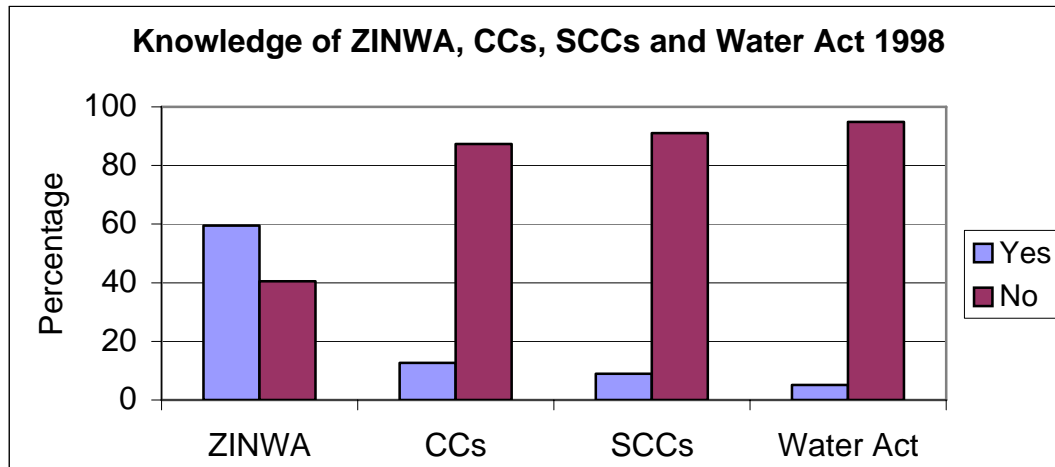


Figure 4.9: Knowledge of ZINWA, CCs, SCCs and Water Act 1998.

While a majority of 60% of the respondents said to have heard of or met someone from ZINWA, however, this comprises majorly of the people who had plots in the irrigation scheme. When these were asked what they know about ZINWA, they revealed that they were not fully aware of its responsibilities as an authority through which the government manages water (as described in the water Act of 1998). All they knew about ZINWA was that it applied for their permit at the irrigation scheme, billed their water, and during times of water shortage, was responsible for rationing their water. Interestingly, some of respondents commented that ‘ZINWA is robbing us’ meaning that they felt they were being overcharged for the water, which they used for irrigation. Figure 4.9 also shows that only 12.7% had heard of Catchment councils. During discussion with the respondents, one of them remarked ‘we do not know about those catchment councils and sub-catchment councils, but we have government officials who are very inactive and inefficient’. When asked which officials these were, the respondent mentioned the councillors, ZINWA officials and the village health officials.

It is noteworthy from figure 4.9 that only 5.1% had heard of the new Water Act of 1998. This was not surprising considering that during my discussion with key informants, the Catchment Manager of Mzingwane, Mr. T. Rosen told me that the rural people were not informed, and may still be ignorant about the water reform and the new modern methods of water management. He told me this was because there were not enough funds to

conduct the awareness campaigns in every ward, so they mainly concentrated on the urban users. He actually asked me if I would be meeting the people as a whole group, so I could take this time during my research to inform them about the water reform and the concepts on which it is based. This implies, therefore that these people were never involved in any consultations leading to the drafting of the new water act, neither did they know it had been enacted. This further implies that these people are not ware of the water sector reform.

4.10 Summary

The results presented in the previous section have revealed a number of issues as regards the water management in the study area; first that the water resources in the area were scarce, yet the livelihood strategies practiced relied on water. Secondly that the people in the three villages managed their water resources traditionally using customary law. The traditional leaders were involved in all aspects of the water resources management; the setting up of rules and regulations pertaining the water resources, punishing the culprits caught breaking these rules, designating specific areas as pertaining the water sources, maintenance of infrastructure, handling conflicts and managing any rising conflicts pertaining the water resources. There was no water allocation system, everyone was allowed to get as much water as they needed, and no-one was given priority of water access, especially during times of water scarcity. The offenders were first warned and eventually fined a goat or the money equivalence. Thirdly, that water was managed a whole system with in the chief's area of jurisdiction, whereby the people were allowed to use other water sources in summer while others like the Sibasa dam were reserved for the winter.

CHAPTER 5: DISCUSSION OF RESULTS

5.1 Introduction

This chapter discusses the main trends, patterns and connections that have emerged from the results presented in the previous chapter. The discussion of these results in this chapter is according to the specific objectives of this study. The first objective was to identify and examine any existing TWM practices among the different rural stakeholders in the Mzingwane catchment. The second objective was to assess to what extent these TWM practices are effective in ensuring food security and improving livelihoods. The third objective was to identify and analyse any implications of these traditional practices in the new formal legislative frameworks of IWRM, and the fourth objective was to analyse the effects of the modern water management practices on the traditional practices.

5.2 Traditional Water Management Practices

Having defined traditional practices as those practices that people today consider to be their own established practices and rules, without interference from any outside organisations, it is clear from the findings that the people in this area practice TWM. As the findings revealed, the management of the water resources across the three villages was informed by customary practices, under the leadership of the traditional leaders. The TWM in this area spanned the entire spectrum of issues: overall water use and access including the rules and regulations; conflict management and handling of offenders; handling of water development issues, and issues pertaining water resources conservation. Such practices, namely; chieftaincy; jurisdiction over natural resources; customary rules governing the distribution of water; and the procedures for initiating development programmes, are “traditional” or “indigenous” institutions, also described as “customary” institutions of governance, and are common practices which have been revealed all over the world (see Katerere and van der Zaag, 2004; Maganga *et al.*, 2003).

The water management in this area is similar other rural Africa societies. Similar research has been done in rural parts of Africa, including in Zimbabwe, to reveal that people still

rely on their traditional practices to manage their water resources despite the water reforms (see also Sithole B., 2001; Sithole P., 2002; Nompumelelo, 2001). Furthermore, these villages represent a typical rural Zimbabwean set-up, where the people are still loyal to the chief, upholding him as the key to most of their social and natural resources issues. The chief still has jurisdiction over the natural resources. It is clear from the findings that IWRM-driven structures are still quite alien to the people, who are, in spite of everything, still dependent upon customary law for the management of their water resources. This is in spite of the country's statutory law for water management, that is, the water Act 1998, which instituted the water sector reform, six years ago. Other related such cases have been revealed, especially around Africa (Boesen *et al* 1999; Meinzen-Dick and Pradhan, 2001).

The rules governing the management of the water resources are set-up by the traditional leaders, who are involved in all aspects of the water resources management. The traditional leaders, together with the community manage the infrastructure, that is the boreholes and the dams, despite the fact that these are set-up by the government. With the various experiences from implementation of IWRM in the water sector reform, it has been discovered that stakeholder participation and community based resource management are the best approach for sustainable water governance (Katerere and van der Zaag, 2004).

Among the TWM practices, as revealed by the findings is the management of conflicts; the chief, the headmen and the village heads are responsible for the handling of any conflicts as regards the water resources. This aspect of traditional conflict management is a wide spread practice, especially in rural Africa. This has been identified in numerous communities and has been said to be very effective (see Maganga 1998), and is sometimes even the most effective option. For example in Zimbabwe, it was difficult for Administrative Courts to settle water disputes, because the judges had little knowledge of the technicalities of water management (Huggins, 2000). In this aspect, diverse traditional practices are more dominant than statutory law, and are relied upon in developing access to water resources and managing conflicts. While case studies from Tanzania concerning

management of conflict pertaining to water resources have shown that the customary way of managing conflicts has been effective (Maganga, 1998). However, sometimes there is need to also use the formal conflict resolution measures.

The traditional institutions as revealed by the findings have been sustainable, besides having been in existence for a long time. There are no clashes and there is no duplication of roles, as is the case for the newly introduced IWRM institutions, where the catchment managers and the catchment councils and sub-catchment councils have overlapping roles which sometimes leads to clashes. The chief, the headman and the village head, the neighbourhood police, the water point committees are all aware of their roles and this minimises or eliminates the aspect of clashes in roles. Furthermore, customary law is flexible and open to negotiation (ISW, 2001), for example the punishing of offenders, as revealed by the findings of this study.

The management of the water resources in this context is based on administrative boundaries. These are based on the area of jurisdiction of the chief Sibasa, who covers two wards; ward 3 and ward 11. This chieftaincy is emphasised in the Traditional Leader's Act, although it was already in existence long before the passing of this act. These traditional leaders were in-charge of the natural resources falling within their boundaries. Such administrative boundaries were socially acceptable to all the members of the system (Mishra, 1998). In such areas, customary law governs the natural resources like water presided over by the traditional leaders. However, with the introduction of the new IWRM-driven institutions, it is still not clear how these traditional leaders and administrative boundaries merge with the newly introduced hydrological boundaries; the catchments and sub-catchments. Moreover, a Catchment as defined does not conform to political and traditional boundaries but instead 'cuts' across these boundaries.

The revelation that these rural people are still dependent on their customary laws for the management of their water resources is partly evidence that the water reform did not reach these rural areas. If IWRM means institutionalising stakeholder participation, as a proxy for water governance (2nd Dublin principle – see Appendix I), how is it practical

for the rural people who are not even aware of such legislation? This lack of consultation of the rural stakeholders negates the efforts to achieve effective water governance, because effective water governance requires the consultation and participation of stakeholders from all sectors, government agencies, water users, service providers, and civil society, and at all levels of the decision-making process (Arriens and Alejandrino, 2004). Globally, the stakeholders are usually different and they have different customary practices, which they have been using to manage their resources.

However, critically examining these TWM practices, some of the aspects are found to be lacking; for example, the findings from this study indicate that while women play a big role in the handling of water resources, they do not have any say in the decision-making process. This similar shortcoming is observed in the currently introduced institutions under the water reforms, where studies have indicated that that gender representation on catchment and sub catchment councils was highly skewed towards men (Gonese, 2002; Sithole, B., 2001). This is despite that the Dublin principles on which the water reforms are based emphasize that women play a central role in the provision, management and safeguarding of water resources, and thus should be involved at all levels of decision-making (3rd Dublin principle-see Appendix I). Other principles recognising and emphasising the involvement of women in natural resources management like water resources includes the Agenda 21 and the Beijing declaration (1995).

5.3 Ensuring food security and sustaining livelihoods

The majority of people across the three villages derived their livelihoods from agriculture and livestock production, which are water dependent. Water is the essential element in rural livelihoods because of the food security and income options it generates in rain-fed and irrigated crop production, and livestock production. Traditionally, there are no water allocation rules; people are allowed to access as much water as they want and water belongs to nobody and can be taken randomly (Jaspers, 2003).

Having defined food security and livelihoods, we can conclude from the findings that these TWM practices have been quite effective for sustaining food production. With even the little available water resources, people are able to engage in irrigation (both formal and informal), water their livestock, and still be able to trade off some of their produce, and make bricks, among other things. However, this is only during the rain season, when water is abundant. Despite the people's ability to access as much water as they want, a considerable number of the people are still unable to produce enough food at household level, let alone earn enough income from crop and livestock production, to provide the basics of life to all their house hold members. This failure has less to do with the water management practices; it is rather due to the water resources scarcity in this area. This is because the rainfall is very unpredictable in terms of amount and timing; it is also very scarce, yet the majority of the people lack access to affordable irrigation (Shah *et al.*, 2002).

Water scarcity is one of the major limiting factors for food security and improved livelihoods for these rural people, thus it is one of the reasons for the poverty in this area. Poverty has many dimensions, but lack of access to a reliable water supply for household as well as for productive purposes is one central feature of poverty in developing countries, and must be reduced drastically if the Millennium Development Goals are to be met (Merrey *et al.*, 2004). This scarcity of water resources calls for increase of productive water to the people. Thus water resources management should aim at empowering the poor people to improve their livelihoods, and achieve long-term equitable economic growth. A number of researchers have revealed that that making even relatively small amounts of water available for personal and productive uses to poor people living in a very arid place like this can transform their lives (e.g., Polak *et al.*, 2002; Lipton and Litchfield, 2003).

5.4 Integration of TWM with the new modern methods

From the findings, it is observed that the majority of the rural water users was not consulted during the water sector reform, and was thus ignorant of this reform and the structures that the reform introduced; the CCs and SCCs, and the new water act of 1998. Those who had heard of ZINWA are not even ware of its role as the national water authority for regulating and operating the water resources. The process of the water reform was supposed to be participatory, involving the lowest possible level. However, the findings expose that this was not the case as regards the rural stakeholders. Researchers reveal that the consultations leading to the water reform focused more on the major water users; the large-scale commercial farmers and the urban water users, neglecting the rural water users (see Kujinga, 2002; Dube and Swatuk, 2002; Latham, 2002).

While the water reform process and therefore introduction of IWRM was supposed to be bottom-up, it is tending to be top-down, where the government seems to dictate how the stakeholders must participate, without much consultation of the rural stakeholders. The catchment manager of Mzingwane attributed this to the lack of enough funds to consult and inform all the water users about the reform, and also that the donors gave the legislators limited time for the consultation of the stakeholders. Thus the policy makers did not have time to consult the ordinary stakeholders like the rural water users. In addition, the water user boards were not recognised in the new water act, it was only after the pilot catchments that the legislators realised that the sub-catchment councils were too large to be effective (Manzungu, 2004) .The dilemma now remains whether and when are these rural water users ever going to understand the dynamics of the new water management, and what is going to happen to their customary water management practices? Or are they going to remain in the dark?

Looking at how these people have relied on these customary water management practices to survive in such an arid area, suggests that these practices have been efficient in sustaining livelihoods. This is because when people build their livelihoods around water,

they create relationships of cooperation and control in order to acquire and manage water systems, and how to survive times of scarcity. How livelihoods survive under scarcity is related to how people understand water scarcity, organize social action to remedy it, and act to defend their rights (van der Hoeck, 2001). In the case of this study, the chief reserves the Sibasa dam for the dry season. Therefore introduction of new modern methods of water resources management should build on such practices, for effective governance of resources.

Among the targets of IWRM is empowerment of poor people, reduction of poverty, improving livelihoods, and promoting economic growth (Merrey *et al.*, 2004), among others. But as currently understood and used, IWRM often tends to focus on second generation issues such as cost recovery, reallocation of water to “higher value” uses, and environmental conservation. While IWRM focuses on devolving the water management to stakeholders in form of catchment councils and sub-catchment councils, it neglects the possibility of existence of different already existing TWM practices. Ethnic groups differ in their perception and values of the natural resources like water. Catchments and sub-catchments span a large area including people of different ethnicity, and thus different TWM practices. While IWRM proposes a ‘blanket’ framework for water management, the people differ in their perception and values of the water resources.

This therefore calls for recognition and consideration of TWM practices by IWRM; the ‘modern’ legislation should not be imposed in such rural settings that have relied on their customary practices since time immemorial (van Koppen *et al.*, 2004), the existing customary law must not be ignored. The challenge facing policy makers in Zimbabwe and other southern African countries is how to modify these deeply ingrained traditional rules and guide them along a path of evolutionary institutional change towards a system of more sustainable natural resource management (Dore, 1996).

There is a growing number of scientists, development workers, and members of indigenous communities themselves, who agree that some solutions to the problems of poverty and environmental deterioration are to be found by merging traditional with

modern scientific knowledge (IHKSS, 2002). This is because customary law is flexible and open to re-negotiation, as indicated by the findings of this study. In order to achieve any effective management and development in rural areas, it is required to involve the rural stakeholders actively in project activities by respecting their traditional knowledge and customary systems. Traditional knowledge has a sound base as it has been tested and practiced over the years (Mishra, 1998). This is because customary practices are appropriate technology in particular climatic conditions and are practical in the living conditions of people. Moreover, issues emerging from the debate on environmental protection and community empowerment have resulted in a strong need to have a fresh look at these older and time tested practices and utilize their benefits for meeting the present day needs of rural and urban areas (Rima, 2002).

The recognition of these TWM practices by the modern ones should be considered with caution, because it is imperative to remember that most of the customary laws and norms are unwritten and flexible, implying that we are dealing with a very complex phenomenon (Boesen *et al.*, 1999). Furthermore, while strategic policy reforms take time to develop and must be adapted to the local scale, to be successful, a prudent, measured approach may be necessary with countries prioritising all-stakeholders involvement, rather than trying to change everything at once. Thus the people will need a phase to transform and adapt to the new methods.

What's more, the implementation of these new reform driven structures does not seem to be favourably carried out; for example the issue of payment for raw water for irrigation. This new principle of payment for water may seriously distort customary institutions (van Koppen *et al.*, 2004) and would hit the most powerless the hardest. Hence there is need for the policy implementers to clearly explain to the new farmers. This way the impact of such structures will be lessened once the people understand the underlying reasons.

5.5 Effects of the modern water management practices on the traditional practices

The previous sections have shown that TWM have long been in existence and are vital to the rural people in terms of water governance, food production and sustaining livelihoods. Hence it is important to sustain or preserve such practices. In addition, most modern practices are alien to the people, for example the IWRM-driven like hydrological boundaries, CCs and SCCs, and catchment outline plans. This means that the water users have to adapt as they adopt these new structures, especially in cases where they have to completely embrace the new organisation, and forget about their customary one. Moreover, the implementation of IWRM does not give much recognition to already existing water management practices. This means that once IWRM is in full gear, all the formerly and currently existing customary practices will be history. Since traditional practices, traditional knowledge and customary law are passed down from generation to generation, they will die out completely if they are not practiced continuously, or protected (ISW, 2001). The role of customary law and practice in the governance of water resources might be eroded by movements that are taking place in society due to globalisation processes and trends of modernity that contribute to the overall erosion of traditional values.

5.6 Summary

This chapter has discussed the findings according to the specific objectives of this study. It has shown the existence of TWM practices in the rural Mzingwane. This included the chief's jurisdiction over natural resources; rules governing the access of water resources, conflict management, and issues pertaining water resources development and conservation. Hence the water resources management is informed on customary practices. It has shown that this customary law is sustainable as regards sustaining livelihoods and water governance. The chapter has also highlighted that customary systems of governance tend to be more widely utilized by the poor, who constituted the greater percentage of water resource users in the study areas. The chapter also makes a case that there is need for the modern ones like IWRM to recognize and build upon these

TWM practices, otherwise they will become extinct. Thus a better understanding of customary law and policy-relevant recommendations on how to strengthen and build upon customary rights is imperative in safeguarding poor people's rights to water.

CHAPTER 6: CONCLUSIONS AND RECOMMENDATIONS

6.1 Introduction

The focus of this study was TWM. This study was done in three villages transcending two wards in Insiza district. The case study revolved around the Sibasa dam which is a small multi-purpose dam, using informal interviews with key informants and questionnaires for individual household heads in order to address the objectives of this study. The findings reveal that although the infrastructure regarding the water resources was donated by other organisations, the general management of these and the water resources is basically customary.

The previous chapters have described customary practices of managing water resources in the rural Mzingwane catchment, discussing their implications for IWRM whilst taking appropriate account of TWM practices in the Sibasa area as a case study. They have shown how the current water reforms in Zimbabwe have focused on the use of statutory legal systems, neglecting the potential of customary practices that the people have been relying on. This final chapter presents the conclusions, that were made from the assessment of these customary water management practices, and their implications for improved water governance. It also gives the recommendations, that is the proposed best course of action. It also gives the aspects that need further research, and discusses the possible implications of this study for policy and practice.

6.2 Conclusions

Almost six years after the enactment of the new water laws in Zimbabwe, the majority of the rural stakeholders do not have any knowledge of the reform- driven structures like the Water Act of 1998, the CCs and SCCs, let alone the water reform itself. This shows how ineffective the implementation of IWRM has been. The water management in most rural areas is still predominantly governed by traditional systems, based on customary law under the major leadership of traditional leaders. These customary practices include; the

rules governing the water resources, the management of infrastructure, the planning regarding the water resources, management of conflicts, and the rain-making ceremonies. The traditional leadership system is responsible for the planning of the water resources, enforcing the rules, designating specific areas around the water sources, handling of offenders, and citing of any developments.

The customary practices described in this study have been able to sustain both the food production and the rural livelihoods, which are all water dependent. In addition, the fact that these people have relied on these customary practices for managing their water resources for such a long time implies the sustainability of these practices. However, the only limiting factor was the scarcity of water resources in the area, which becomes more acute in the dry season (winter). Thus, if IWRM aims at improving rural livelihoods among other things, it should also focus at increasing productive water to such poor people living in very arid areas.

The attempts to introduce IWRM in Zimbabwe have not yet impacted the rural areas, because the people are still ignorant of the newly introduced water management structures, and are thus still relying on the customary ways of water management. The existence of these customary practices despite six years of the water reform suggests the intensity significance and resilience of these practices. In addition, traditional institutions have the advantage of community presence/involvement and the chiefs have a role to play in natural resources conservation, although modern institutions generally overlook them. There is need to support these at community level by a lower tier management structure.

One such way of recognition of this TWM by the modern ones could be the harmonisation of the institutions. The CC and SCC being the lower tiers for water management structures, present an ideal opportunity to consider modern institutions with the already existing traditional ones. The water reforms only recognize the position of chiefs on CCs and SCCs, but only as water users, and not in their full capacity as traditional leaders. This tends to devalue their potential of the traditional institutions. These traditional institutions have community legitimacy, and the village heads being

social centers present an ideal opportunity for grass-root implementation of programs. Therefore the CCs and SCCs can adopt the traditional leaders as their leaders, below which the water point committees would become the lowest tier. Some scholars might argue that the aspect of traditional leaders introduces an element of dictatorship in natural resources management, arguing that chiefs are not elected by the people. However, this is not the case in the African context of Chieftaincy, because the chief, though not elected by the people is still looked at as a ‘champion’, an individual who still commands loyalty among the people and will frontrun any decisions aimed at natural resource management, water inclusive. This loyalty is also expressed towards the other traditional leaders; the Headmen, village heads and spirit media.

The key point is that ‘modern’ legislation cannot be imposed one hundred percent in such rural settings; the existing customary law must not be ignored. If IWRM attempts to put improved livelihoods of the poor at the centre of its goals, there is need for recognition of these customary practices by the modern ones. However, such an integration or development upon TWM needs to be carried out gradually, to allow time to the rural stakeholders to adapt to these new structures and concepts. Furthermore, there is need to first assess the sustainability of such customary practices before their consideration is embarked on for effective water governance. Such a consideration requires that the groups have a common ground, enabling communication and exchange of ideas and experiences both between and within the traditional and modern systems and structures of water governance/management. This does not mean that traditional practices should be forced into formal science paradigms, as is currently being widely done by policy makers in most of the southern African countries in the currently rampant reforms. In fact, communication and collaboration base on the sharing of a common culture, a common vision, which is, in this case, improved livelihoods through improved water governance is essential.

Alternatively, since some countries like Tanzania have existing dichotomy of the legal systems, Zimbabwe might also adopt such a set-up. Therefore, instead of trying to replace a customary legal system with another ‘modern’ one, it is recommended to develop a

uniform all-embracing legal system that accommodates both systems and allows concerted co-existence. This would be effective in reducing rural poverty through empowering the people, and thus improve livelihoods that are dependent on these customary water management practices, and thus improve water governance.

Further more, many rural livelihoods have and still do survive on TWM practices for the management of their water resources. If the newly introduced IWRM-driven institutions and practices are imposed on these rural stakeholders, the customary practices that these people have relied on will become redundant and eventually phase out and die. Thus there is need to perpetuate TWM practices and their sustainability guaranteed, and this can be done through development of the modern practices on the TWM.

6.3 Recommendations

This study has identified that there is need to recognise the traditional water resources management when introducing the modern ones in order to address gaps between the newly introduced IWRM and the water management at the local user scale. Thus the following practical and academic suggestions are proposed:

There is need to communicate the water reforms to all the stakeholders, through consultations, including the rural stakeholders so that they acquire knowledge about the water Act of 1998 and understand how stakeholder institutions such as sub-catchment councils operate. The consultations preceding the reform process should not neglect the stakeholders in the communal lands. There is need to also inform and explain such proceedings to them so that they understand the reason and significance of the newly introduced structures. This way they will be able to appreciate these new organisations, and they will not feel cheated as was the case concerning the water pricing. This therefore means that when drafting the new national legislation, the government should take time to involve all relevant stakeholders, including the rural water users. Moreover, it is not worthy to rush a project, which at the end of the day will not be so successful. Such

communication will smooth the progress of stakeholders in understanding the necessity to participate in water resources management.

The government should find a way to soften the impacts of some of the modern practices that might conflict with the customary law in any specific area. One way the government can do this is by deciding to consider water that is used by the people in such communal areas in irrigation schemes as primary water use, such that this will not be priced. Alternatively, the government should subsidise the water for the poor rural people who need to produce enough food for improving their livelihoods, especially those farmers in the communal lands. This can be done through cross subsidies, where the block tariffs are used and the urban or rich commercial users subsidise water for the poor rural communal farmers.

Since, according to North (1990), institutions are “path dependent” – evolving by continual marginal adjustments, building upon the preceding institutional arrangements – the researcher proposes that traditional institutions, as they are practiced today, are the logical starting point from which rules could be modified step-by-step and steered towards greater conformity with the principles of integrated water resources management. It is this process by which traditional institutions could be transformed to ensure greater sustainability in natural resource use.

Further more, there is need for investigating the effectiveness of the traditional water systems in meeting the multifarious requirements of the people in the given locality, before their consideration is effected. This is because not all customary practices are effective in terms of sustaining livelihoods and improving water governance.

On the academic aspects, there is need for further research to study other ethnic groups in the Mzingwane Catchment so that their customary practices should also be captured and developed upon by the modern practices. This is because customary practices tend to differ from one ethnic group to another, and are thus informed on ethnic groups. Since this study has focused on the majority ethnic group, the *Ndebele*, there is need to carry

out studies to explore other ethnic groups like the *Venda* and the *Sotho* in the Catchment so their customary water management practices can be documented and also considered and developed upon by the modern ones.

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APPENDICES

Appendix I: Dublin Principles

These Dublin principles were an attempt to concisely state the main issues and thrust of water management. They have been interpreted as a requirement for integrated management of water resources (Miguel & Fernando, 1999). This approach was strongly advocated for in the international conference on water and the environment in Dublin 1992, which bore the Dublin principles. Several countries worldwide have adopted these Dublin principles during the water reforms. The principles then resulted in the fresh water chapter 18 of agenda 21 of the United Nations conference on environment and development and in the influential World Bank policy paper on water resources management (Jaspers, 2003).

These principles are listed below:

- Water is a finite and vulnerable resource, essential to sustain life, development, and the environment.
- Water development and management should be based on a participatory approach, involving users, planners and policy makers at all levels.
- Women play a central part in the provision, management and safeguarding of water.
- Water has an economic value in all its competing uses and should be recognized as an economic good.

Associated key concepts to the above include the management of water resources in an intersectional manner and representation of all stakeholders. Water is also managed on hydrological boundaries and the catchment is the smallest unit for water management.

Appendix II: Questionnaire For Key Informants

Questionnaire number:

Date:

A. Introductory:

1. What is the general rainfall pattern in your area?
2. What would you say about the availability of water in your area?
3. What are the major languages spoken in this area?

B. Water resources management

1. How are the following issues pertaining the water resources addressed;
 - a. Water allocation
 - b. Resolution of water conflicts
 - c. Water resources protection and management
 - d. Infrastructure management.
 - e. Ensuring the water is not polluted (ensuring the right water quality)

C. The Role of Traditional leaders:

1. Identify any traditional water management practices in this village. (Practices that you carry out without interference from the government or any other organization)
2. What is/was the traditional institutional set-up?
3. Were/are these practices effective in ensuring food security at household level?
4. Were/are these practices effective in sustaining the livelihoods of the rural people?
5. Do you think these traditional practices of water management were/are sustainable for effective water resources management?
6. What role was/is played by the traditional leaders in the management of water resources;
 - a. The Chief
 - b. Head man
 - c. The village head
 - d. Spirit medium
7. Were/are there any clashes in these roles?
8. What was/is the role of women and the youth in water management practices

D. Attempts to introduce IWRM (modern water management)

1. Have you ever heard of, or met someone from

- a. ZINWA
- b. CCs
- c. SCCs
- d. The new Water Act

2. Have any of these traditional practices been integrated into the new 'formal' legislative frameworks? (Was the traditional institutional set-up recognised during the water sector reform?)

3.If yes, how are these traditional water management practices/institutions functioning well? (If yes, how? If no, why not)

4.What are the impacts of the newly introduced models of water governance (CCs, SCCs, Catchment managers?) on the traditional water management practices?

5.Do the water users (stakeholders) co-operate when it comes to decision-making in the new model of water governance?

If yes, how?

If no, Why?

6.Do you think these indigenous principles can improve water management if integrated in the modern models?

E. Conservation:

1. Is there any form of conservation of water resources carried out traditionally? (water sources, tree planting, wetland conservation?) Explain how?

Lastly: What do you think is the general effect of the modern methods on the people's livelihoods? Have they changed for the better or worse?

Appendix III: Questionnaire For Individual Households

Questionnaire number:

Date:

General Information

A1. Household information :

1. House Head: Name of House Head:

- | | | | |
|-------------|-----------------|---------|-----------|
| Age bracket | 1. below 15yrs: | Gender: | 1. Male |
| | 2. 15 – 30 yrs | | 2. Female |
| | 3. 31- 45yrs | | |
| | 4. 46 - 60yrs | | |
| | 5. Above 60yrs | | |

Educational level:.....

2. (If respondent is not the head of the house hold) Relation of respondent to the House hold head

1. Spouse
2. Offspring (daughter, son)
3. Brother/Sister
4. Other (specify).....

- | | | | |
|--------------|-----------------|---------|-----------|
| Age bracket; | 1. below 15yrs: | Gender: | 1. Male |
| | 2. 15 – 30 yrs | | 2. Female |
| | 3. 31- 45yrs | | |
| | 4. 46 - 60yrs | | |
| | 5. Above 60yrs | | |

Educational level:.....

3. Details of house hold members:

Age bracket	Number of house hold members	Gender	
Below 15yrs		M	F
15 – 30yrs		M	F
31 – 45yrs		M	F
46 – 60 yrs		M	F
Above 60yrs		M	F

4. Village:.....

Ward

District

5. What language did your grand parents speak?

- 1.Ndebele
- 2.Shona
- 3.Tsonga
- 4.Venda
- 5.Other (specify).....

6. What other language do you speak?

- 1.Ndebele
- 2.Shona
- 3.Tsonga
- 4.Venda
- 5.Other (specify).....

7. What languages are spoken in this village (rank with 1, 2,, starting with the most popular)

- 1.Ndebele
- 2.Shona
- 3.Tsonga
- 4.Venda
- 5.Other

(specify).....

A2. Water resources

1. What is the general rainfall pattern in this village? 1.Regular (give months).....

2. Irregular

2. Does the rainfall always come at the same time of the year? 1. Yes

2. No

3. On average, is the amount of rainfall usually the same every year? 1.Yes

2.No

4. What would you say about the availability of water in your village?

- 1.Scarce
- 2.Enough
- 3.Abundant

5. How does water scarcity affect the following?

- i.Livestock 1.Livestock dies
- 2.Less livestock produced
- 3.People take their livestock to other areas
- 4.Other(specify)
- ii.Crop production 1.Crops die
- 2.Less crops produced
- 3.Other(specify)

6. What are the relevant authorities concerning water resources management (Whom do you address your water related issues to?)? 1.the councilor

2.the traditional leaders

3.others (specify)

B. Livelihoods

7. What are the major sources of livelihoods for this household (please rank starting with main source of livelihood)?

- a. Crop production
- b. Livestock production
- c. Casual labourers (where?)
- d. Trading (specify)
- e. Others (specify).....
- f. Remittances From where: 1.South Africa
- 2.Botswana
- 3.Overseas
- 4.Local city (Bulawayo, Harare..)
- 5.Other (specify)
- From what: 1.Mining
- 2.Farming

3.Other (specify)

2. Do you produce enough food in your household for all the members for the whole year?

1.Yes

2.No

If no, why not?

3. Are these practices effective in sustaining the livelihoods of the rural people (that is, is the income at household level sustainable)? 1.Yes

2.No

If no, why not?

4. In this village, what livelihood strategy (ies) is/are most practiced?

a.Crop production

b.Livestock production

c.Casual labourers (where?)

d.Trading (specify)

e.Others (specify).....

f.Remittances

4. What type of agriculture is mostly practiced in this village (please rank, starting with the most practiced) 1.rain-fed

2.irrigated

3.Both

4.other (specify)

5. Have there been any noticeable changes in these practices over time? 1.Yes

2. No

What changes:1.More people tending to crop production

2.More people tending to livestock production

3.More people practicing both

4.People taking up new livelihood strategies (specify)

6. What are the reasons for these changes?

1.Generally increased water resources

2.Generally decrease in water resources

3. Introduction of modern methods (specify)

4.Other (specify)

7. Have there been any changes in income levels (livelihood patterns) noticed at household level overtime (in the past 5-10years)? 1.Yes

2 No

What changes? 1.increase in income at house hold

2.decrease in income at house hold level

3.other (specify)

What are the reasons for these changes?

a. General decrease of water resources

b. General increase of water

c. New methods of water management practices

d. Other (specify)

C. Types of water uses and priorities

C.1 Domestic use

1. Identify your sources of water for domestic use (drinking, cooking and washing) (Rank, starting with source most used for domestic)

- 1. Dam
- 2. Borehole
- 3. Well: Protected..... Unprotected.....
- 4. Rain
- 5. Other (specify)

2. What is the situation of access to water for domestic purposes; proximity to water source:

- 1. Less than 1 km
- 2. 1 - 3kms
- 3. 3 - 6kms
- 4. More than 6km

3. How reliable is your source of water in terms of quantity?

- 1. All year round
- 2. 6 months
- 3. 3 months
- 4. Other (specify)

4. Are there any rules pertaining access, abstraction and use (that is allocation) of domestic water? 1 Yes

2. No

If yes, what are these rules?

.....

5. Who sets these rules? 1. The community
 2. The traditional leaders
 3. The councilors
 4. Others (specify).....

6. Who handles water-related conflicts concerning domestic water use (especially in times of scarcity)? 1. The Traditional Leaders

- 2. The councilors
- 3. The community
- 4. Ward Tribunals
- 5. Other (Specify)

6. Both traditional leaders and the community

C.2 Livestock watering

1. Identify your sources of water for livestock watering (rank using 1, 2, 3...)

- 1. Dam
- 2. Borehole
- 3. Well: Protected..... Unprotected.....
- 4. Rain
- 5. Other (specify)

2. What is the situation of access to water for livestock watering; proximity to water source:

- 1. Less than 1 km
- 2. 1 - 3kms

3.3 – 6kms

4. More than 6km

3. How reliable is your source of water in terms of quantity

1. All year round

2. 6 months

3. 3 months

4. Other (specify)

4. Are there any rules pertaining access, abstraction and use of water for water for livestock watering? a. Yes

b. No

If yes, what are these rules?

.....

5. Who sets these rules?

1. The community

2. The traditional leaders

3. The councillors

4. Others

(specify).....

6. Who handles water-related problems concerning water for livestock watering (especially in times of scarcity)? 1. The Traditional Leaders

2. The councillors

3. The village court

4. Ward Tribunals

5. Other (Specify)

C.3 Small garden watering

1. Identify your sources of water for small garden watering (rank, starting with the most used water source)

1. Dam

2. Borehole

3. Well: Protected..... Unprotected.....

4. Rain

5. Other (specify)

2. What is the situation of access to water small garden watering; proximity to water source:

1. Less than 1 km

2. 1 - 3kms

3. 3 – 6kms

4. More than 6km

3. How reliable is your source of water in terms of water quantity?

1. All year round

2. 6 months

3. 3 months

4. Other (specify)

4. Are there any rules pertaining access, abstraction and use of water for small garden watering? a. Yes

b. No

If yes, what are these rules?

.....

5. Who sets these rules? a. The community
 b. The traditional leaders
 c. The councillors
 d. Others (specify).....
6. Who handles water-related conflicts concerning water for small garden watering (especially in times of scarcity)?
1. The Traditional Leaders
 2. The councillors
 3. The village court
 4. Ward Tribunals
 5. Other (Specify)

C.4 Irrigation

I. Present Situation

1. Identify your sources of water for irrigation (drinking, cooking and washing)
1. Dam
 2. Borehole
 3. Well: Protected..... Unprotected.....
 4. Rain
 5. Other (specify)
2. What is the situation of access to water; proximity to water source:
1. Less than 1 km
 2. 1 - 3kms
 3. 3 – 6kms
 4. More than 6km
3. How reliable is your source of water in terms of quantity?
1. All year round
 2. 6 months
 3. 3 months
 4. Other (specify)
4. Are there any rules pertaining access, abstraction and use of water for irrigation?
1. Yes
 2. No
- If yes, what are these rules?
-

5. Who sets these rules? 1. The community
 2. The traditional leaders
 3. The councillors
 4. Others (specify).....
6. Who handles water-related conflicts concerning water for irrigation (especially in times of scarcity)?
1. The Traditional Leaders
 2. The councillors
 3. The village court
 4. Ward Tribunals
 5. Other (Specify)

II. Comparing before and after introduction of modern water management)

7. Was there any irrigation prior to this irrigation scheme? 1. Yes

2.No

8. Responsibility of day to day/ general management of canals and other infrastructure:

	Then	Now
1.community		
2.Water Right holder		
3.Water Committee		
4.Traditional leaders		
5.Clan		
6.Family		
7.Individual		
8.Other		

9. How was violation of these rules handled and where appropriate punished?

	Now	Then
1.Denied access to water		
2.Fined (specify)		
3.Taken to the Village court		
4.Other (Specify)		

10 Is there any requirement for anyone who wants to access, abstract and use water?

- 1.Own land title
- 2.Own land (not a with a land title)
- 3.Other (specify)

C.5 Other water uses (for example; brick making,)

1. Is there any other major water use in this household?

.....

2. Identify your sources of water for this purpose (please rank)

- 1.Dam
- 2.Borehole
- 3.Well: Protected..... Unprotected.....
- 4.Rain
- 5.Other (specify)

3. What is the situation of access to water; proximity to water source:

- 1.Less than 1 km
- 2.1 - 3kms
- 3.3 – 6kms
- 4.More than 6km

4. How reliable is your source of water in terms of quantity?

- 1.All year round
- 2.6 months
- 3.3 months
- 4.Other (specify)

5. Are there any rules pertaining access, abstraction and use for this purpose? a. Yes
b. No

If yes, what are these rules?

.....

6. Who sets these rules? 1. The community
2. The traditional leaders

- 3.The councillor
- 4.Others (specify).....
- 7. Who handles water-related conflicts (especially in times of scarcity)?
 - 1.The Traditional Leaders
 - 2.The councillors
 - 3.The village court
 - 4.Ward Tribunals
 - 5.Other (Specify)

D. Water allocation

- 1.How is water use prioritised in times of scarcity? (use 1, 2, 3 .. where 1 = first priority)
 - a.Drinking and cooking
 - b.Gardening
 - c.Livestock watering
 - d.Brick making
 - e.Irrigation
 - f.Others (specify)
- 2.Who is given priority to water access (for example livestock watering or drinking water) in times of scarcity?
 - 1.The Traditional Leaders
 - 2.The councilors
 - 3.Other (Specify)
- 3. Who handles matters concerning competition over water resources in this village?
 - 1.Traditional leaders
 - 2.Councillor
 - 3.The sick
 - 4.Other (specify)
- 4. Are there cases when people are denied access to the water?
 - 1.Yes
 - 2. No

If yes, what are the reasons for this denial?
- 6. Are there any fees/contributions that villagers/community currently pay to access water (specify)
 - 1.Yes (Specify)
 - 2.No

E. Roles and Responsibilities

- 1. Who is responsible for the following regarding your water resources?
 - a. For dams

	Day-to-day operation	Maintenance of the infrastructure	Ensuring the right water quality	Conflict management
1.Traditional leaders				
2.Councilors				
3.Neighborhood police				
4.The community				
5.Other (specify)				

- a. Fined (specify)
 - b. Denied access to water
 - c. Other (specify)
8. What is the punishment for those who don't contribute? Are they;
- a. Denied access to water
 - b. Fined (specify).....
 - c. Other (specify)

F. General Water Management practices

F.1 Traditional water management

1. Identify any traditional water management practices in your area (anything that you do without the intervention of any external organisation)

.....

2. Who is responsible for protection water sources traditionally?

- 1.Chief
- 2.Headman
- 3.Village head
- 4.Kraal head
- 5.The water point committee
- 6.Other (specify).....

3. Who is responsible for water technology management traditionally?

- 1.Chief
- 2.Headman
- 3.Village head
- 4.Kraal head
- 5.The water point committee
- 6.Other (specify).....

4. Who is responsible for ensuring good water quality?

- 1.Chief
- 2.Headman
- 3.Village head
- 4.Kraal head
- 5.The water point committee
- 6.Other (specify).....

6. Are there any rain-making ceremonies? 1. Yes

2. No

If yes, explain (by who, how?)

.....

7. How is ownership of water resources under traditional systems established?

- 1. by digging a canal
- 2. by proximity to a source
- 3. Application (specify whom to)
- 4. Other (specify).....

F.2 Integration of these traditional practices in the modern ones

8. Have you ever heard of, or met someone from (yes or No)

- 1. ZINWA (Zimbabwe National Water Authority)
- 2. Catchment Councils (CCs).....

3. Sub-Catchment Councils (SCCs)

4. The new water Act 1998

9. Was the traditional institutional hierarchy recognised during the water sector reform?

1. Yes

2. No

10. Have these newly introduced models of water governance (CCs, SCCs, Catchment managers) affected on the traditional water management practices?

1. Yes

2. No

If yes, what are these effects?

.....

11. Do the water users (stakeholders) co-operate when it comes to decision-making under the newly introduced catchment and sub-catchment councils?

1. Yes

2. No

If no, Why?

.....

12. Do you think these traditional water management practices can improve water management if integrated in the modern models? (Explain your answer)

.....

Appendix IV: Tables of The Results

Note that the code '99' refers to 'not applicable'

hha	ghh	educhh	totalhh	village	ward	langgp	lang.now	lang.vil	genrain	raintimi	samerain	wravaila	efeclvst	efectcp	authorit	livesour	enuffood	enufinc
4	1	2	5	1	1	1	1	1	2	2	2	1	1	1	1	1	1	2
5	1	1	7	1	1	1	1	1	2	2	2	1	1	1	3	1	2	2
4	1	2	6	1	1	1	1	1	2	2	2	1	1	1	3	4	2	2
5	2	2	0	1	1	1	1	1	2	2	1	1	1	2	2	1	2	2
4	2	4	0	2	1	1	2	1	2	2	2	1	1	1	2	3	1	1
2	1	3	4	1	1	1	1	1	2	2	2	1	1	1	2	1	2	2
4	2	2	0	1	1	1	1	1	2	2	2	1	1	1	2	2	2	2
5	1	3	6	1	1	1	1	1	2	2	1	1	1	1	2	2	2	2
2	2	3	5	1	1	1	2	1	2	2	2	2	3	1	2	7	2	2
4	2	1	7	1	1	1	1	1	2	2	2	1	1	1	3	2	1	2
4	2	2	0	2	1	1	1	1	2	2	2	1	1	1	2	7	1	1
3	2	5	8	3	2	1	1	1	2	2	2	2	3	1	2	7	1	1
3	1	5	1	3	2	1	1	1	2	2	2	2	3	1	3	7	2	2
5	2	1	5	3	2	1	1	1	1	1	1	2	1	1	4	7	1	1
4	1	2	0	2	1	1	1	1	2	2	2	2	1	1	4	7	1	1
5	2	2	9	1	1	1	1	1	1	2	2	1	1	1	2	7	1	1
5	1	3	0	3	2	1	2	1	2	2	2	1	1	1	4	7	1	1
4	2	1	0	1	1	1	2	1	2	2	2	1	1	3	3	7	1	1
2	2	3	2	3	2	1	2	1	2	2	2	2	1	1	2	7	1	1
5	1	1	4	1	1	1	1	1	2	2	2	1	1	1	2	7	1	2
3	1	4	4	1	1	2	1	1	1	2	2	1	3	3	1	2	1	1
5	1	1	6	1	3	1	1	1	1	2	2	1	1	1	2	7	1	1
5	1	1	9	1	1	1	1	1	2	2	2	1	1	1	2	7	1	2
4	2	1	6	1	1	1	1	1	2	2	2	1	1	1	4	1	2	2
4	1	2	5	1	1	1	1	1	2	2	2	1	1	1	2	7	1	1
3	2	2	7	1	1	1	1	1	2	2	2	1	1	1	4	1	2	2
3	2	1	0	1	1	1	1	1	2	2	2	1	1	1	4	4	1	1

practliv	typagric	livechan	whatchag	whyhachng	anyhachng	whatchan	whyl	source	proxdome	liabdom	anyrule	setrules	conflict	source	proximit	reliabil
3	1	1	4	2	1	2	1	2	2	4	1	1	3	99	99	99
3	1	1	2	2	1	2	1	2	2	1	1	1	1	1	2	1
3	1	1	2	2	1	2	3	2	1	1	1	2	1		99	99
1	1	2	99	99	2	99	99	3	2	1	1	1	6	1	1	1
1	2	2	99	99	2	99	99	2	2	1	1	5	6	1	2	1
1	1	1	1	2	2	99	99	3	2	1	1	1	5	99	99	99
5	1	1	1	2	2	99	99	4	2	3	1	1	1	99	99	99
2	1	2	99	99	2	99	99	4	1	1	1	1	1	99	99	99
2	3	2	99	99	1	2	4	2	2	1	1	2	1	5	1	1
5	3	1	2	2	1	2	1	4	2	1	1	2	3	99	99	99
5	3	1	1	2	2	99	99	2	1	2	1	1	3	1	2	2
5	1	1	4	2	1	2	1	2	2	1	1	2	1	5	2	1
1	3	2	99	99	1	2	1	4	1	1	1	4	6	1	1	1
2	3	1	2	2	1	2	3	4	2	1	1	2	1	5	1	1
5	3	1	2	2	1	2	1	4	1	1	2	99	1	1	2	1
5	3	1	1	1	1	2	1	2	1	1	2	99	3	5	2	1
5	3	1	1	2	1	2	3	2	1	1	2	99	1	1	1	2
2	3	1	1	2	1	2	1	1	2	1	2	99	3	1	3	1
1	3	2	99	99	1	1	3	2	2	1	2	99	1	1	2	1
5	1	1	4	4	1	2	1	2	1	1	2	99	1	1	1	1
5	3	1	1	2	1	2	1	1	1	1	1	2	1	1	2	1
2	3	1	4	4	1	2	4	2	1	1	2	99	1	1	2	2
1	1	1	1	1	2	99	99	4	2	3	1	2	1	1	2	1
5	1	1	1	2	1	2	1	4	2	1	1	1	1	99	99	99
5	2	1	2	2	1	2	1	2	1	1	1	2	1	1	2	2
1	1	1	1	2	1	2	1	2	2	1	1	1	3	99	99	99
5	3	2	99	99	1	2	4	5	2	1	1	2	6	1	2	1
5	3	2	99	99	1	2	1	3	2	1	1	2	1	1	2	1

ruleslv	wholvst	conflvst	source	prox	relib	rules	whor	conf	source	prox	relib	rules	set	conf	prior	ctrlsch	cnstc
---------	---------	----------	--------	------	-------	-------	------	------	--------	------	-------	-------	-----	------	-------	---------	-------

99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99
1	5	5	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99
99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99
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99	99	99	3	1	3	2	99	1	99	99	99	99	99	99	99	99	99	99
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99	99	99	5	1	3	2	99	6	99	99	99	99	99	99	99	99	99	99
2	99	6	3	1	2	2	99	6	1	2	1	1	4	5	2	1	3	
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1	1	1	1	2	2	1	1	6	1	1	4	1	4	5	2	1	8	
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2	99	1	5	2	2	2	99	1	1	2	1	2	99	1	2	8	3	
2	99	6	4	1	2	1	1	6	1	2	1	1	4	1	2	3	8	
1	2	1	3	1	3	2	99	3	1	1	4	1	4	5	2	8	3	
2	99	1	3	1	3	2	99	3	1	1	1	1	4	5	2	1	8	
2	99	1	99	99	99	99	99	99	1	4	1	1	4	5	2	3	1	
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2	99	1	3	1	3	1	1	3	1	1	4	1	4	5	2	8	8	
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1	2	1	3	1	2	2	99	1	99	99	99	99	99	99	99	99	99	99
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1	2	1	99	99	99	99	99	99	99	1	4	4	1	4	5	2	8	8
99	99	99	5	1	3	2	99	3	99	99	99	99	99	99	99	99	99	99
1	5	6	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99
1	4	5	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99

ddmgnt	equalacc	violatio	losewr	isposewr	requmts	usex	sourcex	proxmx	reliabx	rulex	setrulx	conflx	prityhh	priority	hcomptn	denyacc	fees	ddmdam
99	99	99	99	99	99	1	3	1	3	2	99	1	1	4	4	1	1	4

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99	99	99	99	99	99	99	99	99	99	99	99	99	1	4	5	2	1	4
99	99	99	99	99	99	99	99	99	99	99	99	99	1	4	1	2	2	4
99	99	99	99	99	99	1	3	1	3	2	99	6	1	4	1	2	1	4
99	99	99	99	99	99	1	5	2	3	2	99	3	1	4	5	2	1	4
8	3	2	2	2	99	99	99	99	99	99	99	99	1	4	1	2	2	1
99	99	99	99	99	99	1	5	1	2	2	99	3	1	4	1	2	1	1
7	3	2	2	3	3	99	99	99	99	99	99	99	1	4	1	2	1	1
3	3	2	2	2	99	99	99	99	99	99	99	99	1	1	1	2	2	1
3	3	2	1	3	3	99	99	99	99	99	99	99	2	3	1	2	1	5
3	3	2	1	3	2	1	3	1	2	2	99	3	1	4	5	1	1	4
3	3	2	1	2	4	1	2	2	1	2	99	1	2	4	5	1	2	4
3	3	2	1	3	4	99	99	99	99	99	99	99	1	4	5	2	2	4
3	8	2	1	2	4	99	99	99	99	99	99	99	1	1	5	2	1	4
8	8	1	1	1	4	1	3	1	3	2	99	3	1	4	1	2	1	4
1	3	4	1	1	1	99	99	99	99	99	99	99	3	4	2	2	1	5
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1	8	4	99	2	4	99	99	99	99	99	99	99	1	4	5	2	1	3
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99	99	99	99	99	99	99	99	99	99	99	99	99	1	4	1	2	1	4

maintnda	wqdams	confldam	ddmbh	maintbh	gdwqbh	conflbh	clashes	paymnt	paychief	payhm	payvh	paysm	rolew	role	designat	polluter	contribu
5	1	1	4	4	5	1	2	1	1	1	1	4	4	3	5	2	2
5	2	4	4	5	5	1	2	1	1	1	1	4	4	3	3	1	2

1	4	5	4	4	4	1	2	1	1	1	1	4	1	3	5	1	2
1	3	1	4	5	5	1	2	1	1	1	1	4	1	3	2	1	1
2	3	4	4	4	5	4	2	1	1	1	1	2	1	1	2	1	3
1	3	5	4	4	3	4	2	1	1	1	1	4	2	1	5	1	2
1	3	4	4	4	3	4	2	1	1	1	1	4	3	1	2	1	2
2	4	1	4	4	4	1	2	1	1	1	1	4	3	1	5	1	2
4	5	1	1	5	5	1	2	2	99	99	99	99	2	1	5	1	2
4	5	1	1	4	5	1	2	1	1	1	1	4	3	1	5	3	3
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5	5	5	1	1	4	1	2	2	99	99	99	99	2	1	3	1	3
2	4	1	1	1	5	1	2	2	1	1	1	4	3	4	5	1	2
5	5	1	3	5	5	4	2	1	1	1	1	4	1	3	3	1	2
4	4	1	3	4	5	4	2	1	1	1	1	4	3	3	3	1	3
4	5	1	4	5	5	5	2	1	1	1	1	2	1	2	2	1	3
5	5	4	3	5	5	4	2	1	1	1	1	2	1	2	3	1	1
4	4	1	1	4	5	1	2	1	1	1	1	2	2	1	2	3	1
1	3	2	3	1	5	1	2	1	1	1	1	2	1	1	3	1	2
1	3	4	4	2	5	1	2	1	1	1	1	2	1	1	2	1	2
4	3	1	4	2	3	1	2	1	1	1	1	4	1	1	5	1	2

heardcc	heardsc	heardwa	trdhier	ceffontwm	coperate
2	2	2	99	99	99
2	2	2	99	99	99
2	2	2	99	99	99

2	2	2	99	99	99
2	2	2	99	99	99
2	2	2	99	99	99
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2	2	2	99	99	99
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1	1	1	99	99	99
2	2	1	99	99	99
1	1	1	99	99	99
2	2	2	99	99	99
2	2	2	99	99	99