THE EFFECTIVENESS OF THE WATER SUPPLY SYSTEM AT CHAVANI VILLAGE, SOUTH AFRICA

By

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DECLARATION

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ABSTRACT

Most countries of the world are experiencing water crises because water as a natural resource is no longer as freely available as it used to be. The main contributing factor is technological advancement and associated economic expansion that have put a lot of pressure on water resources. The demand for water has greatly increased and this has created serious challenges to the sources of water. The study was carried out in Chavani village under the Nkhensani Tribal Authority. The aim of the study was to find out about the state of water supply system at Chavani Village South Africa. The study followed an exploratory research approach. The data collected include both qualitative and quantitative data. The total population of the study was 103. The sampling procedure included probability and non - probability sampling. Structured questionnaires were distributed to 60 households which were
Selected using cluster sampling, 24 learners from Shinguwa high school was selected for focus group discussions using stratified sampling. There were 12 females and 12 male's .Lastly 16 community members were selected for focus group discussion in a meeting called by the chief on a voluntary basis. A one–on–one semi structured interview were conducted with the ward councilor, the traditional leader and the village water community leader Key informants observations, focus groups, interviews, and questionnaires were used to source out information about the water situation in Chavani village.

Among the key findings is that: a third of the respondents buy their water from those neighbours who have boreholes.Fetch water from springs and rivers. Communal taps are opened 1-2 days per week. Women and children of school going age were the main collectors of water. A majority of the respondents have been involved in a meeting, usually called for by the community leaders, to discuss the state of water in their community. Villagers complained that buying water was costly. They also lamented the inadequacy of communal taps, the long distance travelled to collect water, and having to collect water from an unclean source such as a well. These factors restricted them from fully engaging in agriculture.

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The youth were concerned by the fact that they still had to collect water after school thereby adding an extra burden on them instead of them focusing on their books. The villagers complained that there were many broken pipes resulting in water leakages and bewailed for the lack of technical knowhow to maintain their water infrastructure. Many believe that 'very little' progress has been made to solve the water problem in the community. The study recommends that the current old water infrastructure must be repaired and more boreholes sunk so that every street must have a communal tap. Civic campaigns to educate communities on water harvesting and its conservation should be made. There will be need to train people on the technical aspects of maintenance of water infrastructure involving community members, Government, NGOs, entrepreneurs and other relevant stakeholders. Concerted effort must be made by all relevant stakeholders to ensure that community members have access to water in an equitable manner to enhance community cohesion.

Key words: Domestic water, rural area, water scarcity, Water supply projects, water resource, women.

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To my friends God created time for his dealings with man. He cut out a piece of eternity, measured it, and called it time. Time as god measured it has a beginning and an ending. We are somewhere on Gods timeline. The question is where? Don't judge each day by the harvest you reap but by the seeds that you plant. We can all achieve our goals in life it doesn't matter how long it takes to achieve them.

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ABBREVIATIONS AND ACRONYMS

CSIR	Council for Scientific and Industrial Research
DAWF	Department of agriculture water and Forestry
IDP	Integrated Development Plan
FBW	Free Basic Water
IPCC	Intergovernmental Panel on Climate Change
IWRM	Integrated Water Resource Management
MDG	Millennium Development Goal
NGO	Non – Governmental Organization
NWRS	National Water Resource Strategy
NWA	National Water Act
RDP	Reconstruction and Development Programme
SADC	Southern African Development Community
SANCO	South African National Civic Organization
SAWS	South African Water Services
SPSS	Statistical Package for Social Science
UN – WWAP	United Nations World Water Assessment Programme
VDM	Vhembe District Municipality
VLOM	Village Level operation and maintenance
VWC	Village Water Committee
WHO	World Health Organization
WMA	Water Management Authority

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CHAPTER 1: INTRODUCTION

1.1 Background

The availability of water for domestic and industrial use is currently far less than what it was 2000 years ago when the world population was less than 3 % of its current size. Almost 1 billion people in the world have no access to improved water, meanwhile 2.5 billion people are without adequate sanitation (Gehrig and Rogers, 2009). Most countries of the world, experience water crisis simply because water as a natural resource, is no longer freely available as it used to be. Globally, water has become a scarce resource and in places where water is available physically, it is polluted and it cannot be utilised for domestic purposes (King, Letsoalo and Rapholo, 2003). The scarcity of water has created competition between different water users such as the economic sectors and even among different countries of the world (World Water Day 2007). Technological advancement and associated economic expansion are some of the things that exert a lot of pressure on water resources (Dasouqi, 2010).

The demand for water increased dramatically in the past decade due to the growth in manufacturing industries. Population growth leads to an increase in human activities that increase water demand and pollution. High levels of water pollution limit the availability of water to the continuously growing population. These place a burden on the countries of the world both for primary treatment costs and the secondary impact on the economy (Sibisi, 2010). Developing countries are not exempted from such challenges.Water scarcity is critical in developing nation's where the majority of the population found. There are parts of the African continent where there are water crises because water demand exceeds water supply (Glass, 2010). In 2010 alone, only 61% of the population in Africa had access to safe water and 31% to adequate sanitation (WHO/UNICEF, 2012). The African population is expected to increase and this will have

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an effect on the water supply and management (Dasouqi, 2010). According to World Bank African Strategy (World Bank, 2011) Africa has an opportunity of transformation and sustainable growth. As it is at the take off stage and much of this changes are taking place in cities and it will result in economic growth (Dasouqi, 2010).

Water scarcity in developing countries is one of the most political and social issues. The scarcity of the resource leads to conflicts and would increase with time. People believe that they are deprived access to a vital resource (Gasteyer, 2009). Some of the factors that lead to insufficient water supply inadequate infrastructure and leakages occur due to lack of maintenance. Other factors include low rainfall and high evaporation during summer (Abrams, 2009). Furthermore water scarcity has a negative impact on crops as it can lead to crop failure.

South Africa is generally semi-arid, receiving an average annual rainfall of 465 mm compared to the world's average annual rainfall of 860 mm (Pitman, 2011). For that reason water is in short supply yet it plays an important role in the environment and people's lives. South Africa has a number of perennial rivers that are the main source of water for the country. Some of these perennial rivers are shared based on riparian rights with neighboring countries. For instance, South Africa shares water from Limpopo River with Botswana and Zimbabwe; water from Orange River with Namibia and Lesotho as well as water from Crocodile River with Swaziland and Mozambique (King, *Letsoalo and Rapholo,* 2003). In 1994 the South African government mandated the Department of Water Affairs and Forestry (DWAF) with the responsibility of managing water supply and sanitation in the country (Muller, 2002). The department came up with a number of policies to govern water utilisation and availability in the country. The National Water Policy (NWP) was adopted by the Cabinet of South Africa in 1997 with the objective of managing the quality, quantity and reliability of the Nations water

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resource (DWAF, 2006). The fundamental objective of the department was to achieve equitable access to water and ensure sustainable use of water by implementing measures that protect water resources. The Water Service Act 108 of 1997 states that water service authorities have a duty to provide water services to all consumers in their jurisdiction and to ensure that there is efficient, affordable, economical and sustainable access to water in the areas. Changes were made to the water policy of South Africa to address issues of equity, distribution and efficiency in water use as stated in the National Water Act (NWA No. 36 of 1998).

The South African government has an overall responsibility to ensure that water as a natural resource is allocated equitably and that water is used to the benefit of the public interest as stated in chapter four of the NWA (DWAF, 2004). Another important section of the NWA deals with the water resources reserves. These are the basic human needs reserve and the ecological reserve (NWA, 1998). The human needs reserve provides for individuals served by water resource authority in question and includes water for drinking, food preparation for personal hygiene. The National Water Resource Strategy (NWRS, 2004) states that water has to be used to achieve social equity economic efficiency and environmental sustainability (DWAF, 2002). The DWAF has been able to implement its water policies in the country but challenges remain due to high levels of poverty, inequality and high number of people who cannot access water (King, 2003).

It is reported that in 1994, only 60% of the South African population had access to clear clean water (DWAF, 2009). By 2008 the proportion of the South African population that had access to clean water had gone up to 88% (DWAF, 2009). While the progress is impressive, rural areas still lag behind (Rosenfeild, 2010). The rural poor are often exposed to the ravaging effects of polluted rivers and are the least able to protect themselves from these problems.

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Water shortage is serious threat to the level of agricultural productivity and ultimately general development of the country (King, 2003). Agriculture is the backbone of rural economies and without sufficient water; communities suffer a great deal (World Water day 2007). Rural communities of South Africa are responsible for providing agricultural products to feed the increasing population. They also provide raw materials for industries and it is for this reason that serious efforts should be made to ensure that water resources are well managed and access issues are improved. There is also serious competition between agriculture and industrial uses for water. The increasing competition for water among the water users coupled with a decline in decline in the supply of water (Hassan and Crafford, 2006).

Limpopo Province is a water scarce province and is dependent on surface water for irrigation (DWAF, 2004). The province is one of the major producers of vegetables in South Africa (M'marete, 2003). The water is not sufficient to meet the ever increasing demand so ground water is now also being utilised. Water availability is limited by the underlying bed rock and the aquifers that are unevenly distributed making it difficult for certain areas to utilise ground water (DWAF, 2006). Limpopo Province is also an implementer of the national water policy that certifies that water belongs to the people although nationally, DWAF is the national custodian of all water resources as it has the responsibility of protecting the water that is utilized. For that reason the available water is distributed among the different sectors with 53% used for irrigation services and the remaining 47% is divided among other sectors such as the mining industry which utilizes 8% of the water, the urban area has a share of 24% and power generation and forestation and international obligations sharing the remaining 15% (M'marete, 2003).

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In March 2010, the Vhembe District Municipality in Limpopo Province held a national water week under the theme "Working together we can save water" (Razwedane, Shivambu, Tshwenang, 2010). The main purpose was to highlight the challenges faced by the country with regard to water scarcity and to explore measures to be used to save water. There is concern that the boreholes which have been installed to solve the problem of water scarcity in the Vhembe District are drying up due to lack of sufficient rainfall (Razwedane, *et al.,* 2010).One of the challenges that affects the district is illegal water connections by community members. The Vhembe District Municipality (VDM) Integrated Development Plan (IDP) 2012 indicated that there is a water backlogs which was estimated at 38 204. Households were receiving water below the Reconstruction and Development Programme (RDP) standard.

Makhado municipality which is one of the 4 municipalities which fall under the Vhembe District Municipality has inadequate infrastructure to meet the water demand in the village. According to the Makhado annual report for the year 2007/2008 the municipality does not have sufficient funds to repair the deteriorating water infrastructure. Water supply in Chavani village under Makhado municipality is below (RDP) standard (IDP, 2009). Households are entitled to 6000 litres of water per month at no cost to them (DWAF, 2007). Community members in Chavani collect water from the taps situated 200 m from the household, they carrying plastic containers on top of their heads (Fortin, 2006). Most households in the communities under Makhado municipality do not have access to water at household level in some areas boreholes are drying out (IDP, 2009). Water shortages have a drastic impact on the quality of life of people in rural areas, as water scarcity usually reduces access to good hygiene and lead to diseased and poverty.

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Programmes meant to bring water to the South African communities have been put in place. These include the national water and sanitation programme which is one of the largest national programmes in South Africa. Its main aim is to ensure that people have access to water and have access to sanitation services (Muller, 2002). The key elements of the programme include the capital works programme which provides infrastructure to meet the basic water supply needs. The policy on free basic water states that there should be no barrier to achieve access by all too sufficient water in the country (Muller, 2002). South Africa like many other countries has experienced a mixed bag of water projects with cases of successful water projects and others that have failed (Parry-Jones, Reeds, and Skimer, 2002). Currently there are projects to ensure that water is accessible for domestic, agricultural, and industrial purposes. The United Nations World monitoring day with the objective to raise public awareness and the importance of water quality in people's lives (UN – WWAP, 2010).

1.2 Statement of the research problem

It is a fact that water is key to the eradication of poverty and underdevelopment and that South Africa is experiencing serious water problems to the extent that Gauteng, the industrial heartland of the country has water demand outstripping its supply (Mckenzie and Wegelin, 2008). The supply driven approach put in place between 1960 and 1970 and supported by non-governmental organisations (NGOs) and international organisations aims at solving the problem. However, as has also been noted by Rosenfeld, (2010), many informal settlements and rural communities around South Africa still lack basic services among which access to potable water always triggers service delivery riots. For the Millennium Development Goal (MDG) to be successfully achieved there is an urgent need to address the water-related problems in the rural areas (Mehta, 2005). The Department of Water Affairs and Forestry (DWAF) invested in

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alternative ways to conserve water and has developed management strategies to alleviate the problem but many rural areas like those in Limpopo Province are still without access to safe water resources (Mckenzie *et al*., 2008).

The South African Constitution clearly states that water is a human right, and that right is not exclusive. It includes even the communities under the Nkhensani Tribal Authority who have been without potable water for the last 16 years (Gabru, 2005). In particular, Nkhensani Tribal Authority which consists of the following villages Chavani, Bokisi, Nwaxinyamani, Mbokota and Riverplaas areas has been experiencing different water problems but generally people do not have easy access to water and currently most of the residents depend on those who have private boreholes in their yards. Water pipes are found at a distance of not more than 200 m from the households (Statistic South Africa, 2009). Yet water taps have run dry and some community members resort to buying water from those community members with boreholes. Those who cannot afford to pay for the water, draw some from unprotected local springs that are also sources of water for domestic animals and livestock. Taps have run dry and community members buy water from those with boreholes and those who cannot afford to pay for the water, get it from one of the local springs which is not protected. Domestic animals drink from the same source.

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Some community members have to walk long distances to Ritavi River to do laundry. Meanwhile there are only 48 flush toilets in the community with a population of 8871 (Statistic South Africa, 2009). Solving the water problem could improve sanitation. Therefore it is important to investigate the water situation in Chavani village under Nkhensani Tribal Authority. This will help in removing the barrier that makes it impossible for the household to cultivate land for food production purposes. The problem investigated in the study relates to water access for domestic use, the collapse of water supply infrastructure, and its impact on the community of Nkhesani Traditional Authority in Vhembe District of the Limpopo Province.

1.3 Significance of the study

The study is important to the Department of Water and Environmental Affairs, the traditional leaders (chiefs), ward councillors, and the community of Nkhensani Tribal Authority and as well as the local municipality as it will be able to address a number of water-related challenges facing these areas and surrounding areas.

New evidence to the diversity of water supply problems in the rural areas of South Africa will be provided. The study will also reveal to both Vhembe District Municipality and the province at large the situation that communities face in rural areas. It is envisaged that this will stimulate intervention in water development that focus on poverty alleviation. As the old adage goes, water is life – so without water, there is no life.

This study will contribute to the solution on the problem that is experienced in the area and help communities to participate in coming up with solutions that respond to their water needs. Water as a natural resource is a key to success, it can help in reducing poverty in the rural areas. When communities have access to water they are better able

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to engage in agricultural activities. Research gaps will be created for further studies to be carried out in the same area.

1.4 Research objectives

The objective of the study is to find out about the state of the water supply system at Chavani Village in Limpopo, South Africa. The specific objectives were to:

1. establish the water supply situation and challenges in the Nkhensani Tribal Authority
2. assess the community's perception on solving the problem
3. assess the effectiveness of the existing interventions to solve the problem
4. recommend possible sustainable arrangements to solve the problem

1.5 Research questions

1. What is the history of water supply in the area?
2. What are the obstacles hampering achievement of the goal of access to water?
3. What is the impact of the shortage of water on the communities?
4. What kind of approaches can be adopted to solve the problems of water in rural areas of Nkhensani Tribal Authority?
5. What are the roles and responsibilities of the councillors, traditional leaders (chiefs) and the municipality and communities in solving the problem?

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1.6 Operational definition of key terms and concepts

Water cycle: A natural and continuous process in which water changes from one state to another from underground it is redistributed in the landscape (Hirji, Jonhson, Macro, Chiuta, 2005). Community: Group of people who have some sort of social cohesion structure. A community can be a remote rural village. Communities are often classified as rural, peri-urban or urban. In the context of this study, communities are considered to be rural villagers.

Community participation: A process through which stakeholders influence and share control over development and management initiatives and the decision and resources that affects them. In this study community participation is defined as the involvement of citizens in a wide range of administrative policymaking activities including the determination of levels of services budget priorities and the acceptability of physical construction projects in order to orient government programmes towards community needs, build public support and encourage a sense of cohesiveness within society (Fox and Mey, 1995).

Climate change: A change in the sum total of the weather experienced in an area over years which is attributed directly or indirectly to human activity and alters the composition of the global atmosphere in addition to climate variability observed over comparable time period (Agnew and Anderson, 1992).

Elnino : The warming of eastern and central pacific ocean waters which bring about change in global weather patterns by affecting air and ocean temperatures and is associated with below average rainfall in Southern Africa (Hirji *et al.*,2005).

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1.7 Organisation of the research

Chapter 1 provides the background of the study containing orientation to the study, statement of the research problem; research questions, research objectives, operational definition of key terms and concepts and finally the organisation of the research proposal.

Chapter 2 presents literature reviewed on water projects that have collapsed. It focuses on water problems experienced in the world, sub–Saharan Africa; South Africa down to Limpopo Province

Chapter 3 presents the research methodology of the study which included a description of the study area; the research design; the population and sampling procedures; data collection methods; data analysis; and ethical considerations for the study.

Chapter 4 presents the findings and discussions in the form of analysis of the qualitative data using narratives in conjunction with tables and graphs. Pictures are also used to achieve visual impact.

Chapter 5 presents the findings and discussions of quantitative data tables; graphs and pie charts are used.

Chapter 6 provides the conclusions and recommendations aligned to the research objectives. A broad summary is also provided.

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CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

Water is essential to life promoting the wellbeing of society through its different beneficial uses (Barrow, 2006). To develop community projects there is a need for water. People need water for a wide range of activities which could result in poverty alleviation. For instance water is needed for sanitation, agriculture, domestic purposes, agriculture and industries rely heavily on water. However there is a challenge as water projects that have been started to supply water to rural areas are collapsing.

Therefore the objective of this study is to establish the water supply situation and challenges in the Nkhensani Tribal Authority. It was essential to assess the community's perception on how the problem of water could be solved. Assessing the effectiveness of strategies aimed at solving the water problem in the community. The study also intends recommending possible sustainable arrangements to solve the problem. The purpose of this chapter was to review literature about water projects in South Africa and from other developing countries. Knowledge about water, criticisms of water projects and recommendations from different sources of information from the world, Sub-Saharan Africa and South Africa was reviewed in order to gain a better understanding of the problems related to water scarcity.

2.2 Water uses in the world

Water is a key natural resource for human survival. Water is used in both the input and the output phase of the economic process. Its use is useful in the economic production of goods and the provision of services. The primary sector use water in agriculture, forestry and mining. In Chavani village water is used for agriculture to a minimal extent, building, and domestic purposes, brewing of traditional beer and livestock rearing. In the secondary sector, water is essential for construction,

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manufacturing and electricity generation. Water demand and competition increases with industrialization, pollution, natural disasters and drought (Leigh, 2012).

2.2.1 Constraints on water availability

According to Uitto and Biswas, (2000) third world countries are faced with a variety of complex problems. These problems should be addressed to ensure that everyone has access to clean water and sanitation services. Wright, Gundry, and Conroy, (2009), stated that water authorities have made an effort to provide people with protected boreholes. Nevertheless, many people in developing world are still depended on untreated rivers, springs or boreholes for drinking water and domestic purposes. Standpipes are available to households at a distance of 200 m from their homes (DWAF, 2004). However water is not always available when it is needed for use by households.

According to Rosegrant, Ringlerand and Zhu, (2009) new water constraints will affect water availability for agriculture. Makgope and Butterworth, (2001) reported that studies conducted on water supply constraints indicated that an improvement in water supply for vegetable gardening. These reports concur with reports by Perez de Mendiguren and Mabelane, (2001) who reported improvements in water supply actually led to improvements in vegetable gardening, livelihood and food security. Improvement in water supply also led to Improvement in building projects. Communities were able to engage in irrigation of fruits. Water scarcity limits the future development.

2.2.2 Water scarcity in the world

In developing countries water supply is still a major challenge, as it does not meet demand. Water supply in developing countries is limited since availability depends on precipitation. (Merz, Gopal and Weingartner, 2009) report a shortage of water for domestic use and agriculture. According to Hirji, *et al.,* (2002) the amount of available water for human consumption in South Africa is limited and some rivers

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and streams are almost dry. According to Donkor and Yilma, (2003) the availability of water is determined by the amount of rainfall the country receives at a particular time. The variation in the annual precipitation is unpredictable. This is supported by Madzwamuse, (2010) rivers flow during rainy seasons and they are dry during times of drought.

Water has become a vulnerable resource due to effects of climate change. There is an increase in the demand for underground water as households and other sectors in the country drill boreholes to access the scarce resource. These has a negative impact on ground water as people pump more than what the aquifers can provide. This has resulted in outstripping supply. All these affect the water table through a decrease in the amount of water underground.

2.2.3 Maintenance practice of infrastructure in the rural areas

One of the factors affecting water as a resource is lack of regular maintenance of infrastructure especially in the rural water supply projects. Obi, Momba, Sannie, Igumbor, Green, Muscle, (2007) report that equipment and hence failure was one of the major challenges as approximately 60% of the operators who responded to the questionnaires indicated that tools were not regularly serviced. This led to failure of the equipment and hence poor water quality. Lack of maintenance and sustainability of water supply is also affected in the situation where infrastructure is not managed well resulting in high rates of water loss per capita due to internal leakages in houses and the deterioration of pipeline infrastructure (Leigh, 2012). The rural schemes that were initiated proved to be unsustainable due to faults in the design of the projects. There is also a lack of in-service training and no motivation for operators from management.

Van Niekerk and Dupisan, (2006) indicated that infrastructure water supply is generally in a reasonable state but it is deteriorating. Local communities do not always have the knowledge, tools and other resources to repair damaged water

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pumps. According to Gomez, (2000) the main objective of all water supply networks is to keep water in the community to a minimum requirement. When water projects are designed estimates of the population are made over time but after some time the project fails to meet the flow pressure requirement. This might be as a result of higher demand due to an increase in population or industrial development and human activities.

When a project has been running for a certain period of time, the pipes deteriorate. While some of these problems can be resolved through the regular maintenance of water pipes, slowly the system can be affected by corrosion and other problems that arise during the construction of other buildings in the area. The study further indicated that for a water supply project to overcome obstacles, it is important that the pipes be repaired on a regular basis. When the pipes are old, there should be provision for the replacement of such pipes. When the population in the areas increases, provision should be made to increase the pressure of water to accommodate increase in water use. There is general consensus amongst the various researchers for a repair of tools and machinery. However, there is still a gap to be filled in this section more specifically, with regard to finding out how these problems should be handled in the communities. It is vital to include members of the community in coming up with solutions to such problems.

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2.2.4 Issues related to community participation

Full public participation and involvement of users in planning and implementation of water projects is regarded as essential. Several studies have stated that community involvement in all aspects of water resource management has been one of the pillars of success in many regions of South Africa (Hinji, 2002). Wilson, Malakoana, and Gouden (2008) argue that poor involvement of local communities creates problems more specifically at sub national water service provision. Louw, (2003) says that community members must be involved in coming up with programmes. These

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programmes can be used in providing monitoring and evaluation of water projects once they are implemented. The service providers should make use of implementing the bottom up approach for development to take place in accordance with the needs of various communities. After all the main objective of community structures is to make sure that there is service delivery.

When community members are involved in water delivery projects they feel that they have ownership of their lives and their involvement can help in sustaining the water projects (Benhin, 2006). If a water project has to be successful relevant stakeholders together with the beneficiaries which are the water users need to be involved and work as a team from the beginning to the implementation and operation of the water project. This is supported by the case study conducted in the Highlands of Kenya community members who were involved in the planning to the running of the water project. Both men and women worked together to make the project a success (Were, Roy and Swallow, 2008).

The Department of Water and Forestry (DWAF) 2005 stated that without public participation the goals of water resources management cannot be achieved. According to Wilson *et al.,* (2006) in a study done in KwaZulu-Natal, it was discovered that it was difficult to include members of the community in the discussions about water. There was lack of participation in eThekwini Municipality. When people attend the meetings their main objective was to complain rather than helping in coming up with solutions to the problem. There was no form of communication between the service providers and the community. Furthermore, DWAF (2005) stated that without public participation, the major goal of supplying water cannot be achieved. A case study done in Kenya in 2007, and was presented in Nairobi came up with the following recommendations for factors that led to the collapse of water projects in the community. It is advisable for the service providers to start their projects at grass root level rather than implementing without consultation (Kimani – Murage and Ngindu, 2007).

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When community members are included in decision making they know that they have ownership of the project. It becomes easier to explain the importance of managing water as a scarce resource. Members of the community who are in leadership positions are willing to be trained on water management as they realise that it is important to have certain skills about water delivery. They also find it necessary that water operator should undergo training. Strachan, (2004) indicated that community participation is essential but at present the involvement of communities in the running water projects is limited. Meanwhile there are various challenges that are experience as the demand for water exceeding the supply of water (CSIR, 2010).

2.2.5 Challenges brought by rapid change in the demand for water

The availability of water in the world is of greater concern to the water authority .It is advisable for the countries of the world to manage this limited resource as effectively and efficiently as possible so that there is sufficient food even for future generations. Rosegrant, Cai, and Cline, (2003) stated that global food security is faced with challenges of water in the world as its food security availability is declining. In the near future countries of the world have to learn to reduce their consumption of this scarce resource. Leigland, (2007) in the report for Imawesa policy water is one of the leading causes of poverty and hunger. It is advisable that the land and its water should be used sustainably. The agricultural sector is dependent on the availability of water for productivity to take place.

Rain-fed cropping represents the backbone of agriculture (Leigland, 2007). However there is a problem which is associated with rain-fed agriculture as there is a possibility that the amount of rainfall might not be enough. There have been recurrent dry spells that limited or lead to poor crop production at times. As a consequence of this is that the country can experience crop failure. As climate varies

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constantly it can affects the availability of food in the world. Man can only do what nature permits for if there is drought, for farmers it means productivity is going to decline. Despite capacitating the communities throughout the world in water management and conservation, countries of the world are faced with a water crisis for the taps are increasingly running dry. If the taps are running dry, is the world managing the scarce resource well? The countries will reach a stage where water as an economic good becomes expensive in response to its supply and demand.

2.3 Drying lands in sub-Saharan Africa

More than half of Africa's population is without safe drinking water and two third of the population do not have access to adequate sanitation. Thirty nine water privatisation schemes in Ghana and South Africa are further depriving poor people from access to potable water. In sub-Saharan Africa, there are both successful water projects and other projects that have failed. The purpose of this section is to review the literature under the topics: water as an economic resource; water shortage related problems; climate change and the plight of women in Africa.

2.3.1 Water as an economic resource in sub- Saharan Africa

The growing scarcity of water implies that water must be treated as an economic resource instead of treating it as a common free good. Economic water scarcity exists when a population does not have the necessary monetary means to have access to an adequate source of water. Van Niekerk and Du Pisani, (2006) state that the South African government expects community members to pay for the water service in line with the policy for water users. This is a tall order as rural communities are either not able to or are not prepared to pay the funds asked for. Meinzen-Dick and Rosegrant, (2001) state that water pricing is essential as it assists in recovering the costs incurred when building and operating the water resource. When payments are made available for the utilisation of a water resource the authorities can create

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incentives that could assist in water conservation. According to Manyanhaire, Matewa, Svotwa, and Munhuwa, (2009) local authorities were prepared to supply water in the area of study but there was resistance on the part of the community to pay the rates .The main reason raised by the community is that before the closure of the mine water was freely available.

Parry-Jones *et al., (*2002) state that many projects are faced with problems that emanate from community members who are not willing to make contributions for the service that is provided. When members of the community are tasked with the responsibility of collecting fees for the amount of water that is utilised in a particular month, only a little amount is collected. This creates a problem as the money does not cover the costs that were incurred when the project was implemented. In other instances, money will only be collected when problems arise. For instance, when the water pump is not working as a result of wear and tear it is then that those who are responsible for collecting money in the community collect funds so that the water pump can be fixed. Lack of financial assistance during the running of the project is one of the factors that can lead to the collapse of water projects. Lack of funding therefore is one of the major obstacles to achieving the goal of supplying water to the rural communities as pointed out by the above studies. If that is also a problem in these villages, the study seeks to find out from the members of the community how this problem can be solved. In case the villages are experiencing other different problems regarding the sustainability of water projects, this warrants investigation. If invaluable information is gathered appropriate feedback to relevant stakeholders will be done in order to minimize the failure of projects in the communities.

2.3.2 Water shortages related problems in sub-Saharan Africa

A study done by Manyanhaire *et al.,* (2009) revealed that when a country does not have enough water and adequate sanitation, such a country's population can suffer from water borne diseases. People mainly affected by this problem are the poor who are mostly women and children. On the other hand sub-Saharan Africa is one of the

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regions which are affected by different types of diseases which are associated with the shortage of water. The quality of water is often poor as a result of pollutants in the water. The main source of pollutants was stated as waste material and sewage runoff. This is the main cause of diseases in developing countries. Typhoid and cholera affect rural areas as there is lack of sanitation. Infectious diseases such as cholera, typhoid, and hepatitis occur where the water is available in short supply.

Donker, (2003) in his argument supports other researchers in that there are diseases caused by water-related problems and this affects the sustainability of economic development. This also undermines investments and all the plans that have been put in place to alleviate poverty. When people are sick in the country, it leads to lower energy levels and this causes a decrease in the level of production as the labourers become sick, thereby affecting productivity. When the productivity level declines there is loss of income and people die at a younger age. According to Hirji *et al.,* (2002) sub-Saharan Africa is one of the regions where per- capita food production has declined in the past two decades. The regional economy has not been performing well because of drought.

Craswell (2006) argues that rural areas are faced with problems which are not encountered in urban areas. It is expensive to supply rural households with water as they live in dispersed settlements. People who live in rural areas are either unemployed or if they are working, their income is low which makes it difficult to fund and maintain water projects which are made available to them. In a study done by Schoch, (2007) it was observed that an average distance travelled to collect water was sometimes too far more than 200 meters. The diversity of water problems in the community needs to be explored as water affects also the youth in the community. There is need to establish from the younger generation in the community what problems are accompanied by the short supply of water. The African continent is vulnerability to climate change (Madzamuse, 2010).

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2.3.3 Climate change in sub-Saharan Africa

The climate of the world changes from one decade to the other .Human activities have an impact on climate as it is natural and has varied from one decade to the other. There is concern that human activity is leading to a situation where climate change might occur too fast. South African Water Services (SAWS, 2005) stated that climate change is the natural cycle through which earth and its atmosphere are going to accommodate the change in the amount of energy received from the sun. According to Hartfield and Prueger, (2004), climatic change has a significant implication for agricultural production and management practices that affect water quality. Mzezewa, Misi, and Van Rensburg, (2010) state that for crops to grow in a particular year the growth depends on the availability of sufficient rainfall. If the country does not receive enough rainfall during the year, there is a decline in crop yield for that year. The rainfall patterns of a country can affect the availability of food in the country. This is a challenge to the agricultural sector which is responsible for supplying food. Without sufficient water it becomes difficult to raise livestock.

Poor productivity has been associated with shortage of water in particular low and poorly distributed of rainfall across the surface of the earth. During times of drought there is no guarantee of food security, as drought has an impact on the productivity of crops and can lead to crop failure per annum due to water constraints. The World Health Organisation (WHO), (2000) states that the climatic change has different consequences that affect sub-Saharan Africa. When climate change the food produced by the agricultural sector may decline drastically by the year 2050. Semi-arid regions are the first to feel the impact as agricultural produce declines and communities experiencing water borne diseases. According to Segenu, (2006) women and children are vulnerable to the effects of water shortages.

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2.3.4 The plight of women in Africa with regard to water

It becomes difficult in the African continent to separate women from water as they are the ones who are chiefly responsible for the availability of water for household use. When there is a shortage of water in the community, they are the first to suffer the consequences. According to Nandita, Prosun, Gunnar and Gustafsson, (2003), it is important to link women to water in more than one way. Firstly, they have been regarded as the beneficiary of water projects, particularly when referring to domestic water supply schemes.

Secondly, they are responsible when it comes to the management of water as they are the first to participate at community level since they possess the major interest in the local water availability. A study by International water and sanitation centre (IRC) revealed that of the 88communities studied in 15 countries, it was found that water projects which include women from the community were sustainable than when women are excluded (Wijk-Sijbesma, Mukherjeen and Gross, 2001).

Berntell, (2008) suggested that involving women in the planning for the supply of water in different parts of the world will lead to environmental sustainability (Rust and Hanise, 2009). The author further indicated that women have more knowledge about water quality, availability and its reliability in the community. Acknowledgement of the work that women and girls do in the community is important but are they the only people who are involved in collecting water? The answer is that they may not be the only ones, but the truth is that most of them do take part.

Uitto and Biswas, (2000) supported the fact that planning and decision making should include all affected parties in order to foster direct participation of affected interests. In a study conducted in Senegal, hundreds of thousands of women stated that they spend hours searching for clean water every day. Manyahaire *et al.,* (2009) state that in Zimbabwe in the district of Makonde the distance covered by women generally to be 1.4 km in the wet season to 2 km in the dry season.

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When the country is experiencing drought it was possible for women to travel for 5 to 6 km for domestic water. The burden of carrying water had other effects on women. The study revealed that women experienced problems such as of the spine and pelvis and this created problems in pregnancy. It was also discovered through research that periods of water shortage coincide with food shortages (Pedro, Garzon and Strosser, 2012).

2.4 South African water situation

South Africa is one of the countries located in the drought belt of the globe. As a result, it has limited amounts of water available per annum. The country is ranked as one of the twenty most deficient water systems in the world (Ashton and Haasbroed, 2002). Water is essential for life on earth and an adequate supply is needed if the country has to meet the amount needed for human consumption and economic development. In this section it is important to focus on the following topics water supply and management, lack of user involvement and water quality.

2.4.1 Water supply and management in South Africa

Water is one of the natural resources that come from nature and it flows naturally on the earth's surface and when it rains it is life (Gehrig and Rogers, 2007). Without clean water people, animals and plants die. When a country has water, development takes place as human activities are dependent on water. Throughout history, water has been utilised as our potable resource, for cleaning, industrial and agricultural purposes. Therefore water management is of importance in a country like South Africa since it is available in short supply. The South African water law chapter 3 part 3 of the South African National water Act (NWA) of 1998 deals with the reserve which consists of two parts, basic human needs and the ecological reserve.

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the fact that water resource management is not understood by policy makers and planners. The challenge in rural areas is to ensure that there is adequate infrastructure.

2.4.2 The quality of water in South Africa

The quality of potable drinking water depends largely on the source of water used and the level of treatment that is available (Peason, Roberts, Osoge, Ivanova, Mayer and Mescheke, 2008).The majority of the people in rural areas depends on ground water which is untreated and prune to faecal contamination. Fosso-Kankeu, Jagals and Dupreez, (2008) indicated that water that is collected from boreholes and standing water pipes is stored in the households in plastic containers and by the time the water is used for domestic purposes is already contaminated.

The DWAF (2006) in a guideline for water supply states that underground water which is less exposed to evaporation is often of better quality and provides a cyclical surface water supply. Nieuwoudt, (2000) stated that the water which flows from Fish and Sunday River's is not suitable for domestic use as the water is highly polluted and contains salts and the water cannot be utilised for irrigation purposes. The research conducted in Port Elizabeth supports the findings about the Fish and Sunday Rivers.

Water is vital to life, it promotes the economic and wellbeing of the society through its diverse and beneficial uses but if the water is contaminated it becomes deadly to the users. Fosso-Kankeu *et al.*, (2008) state that people continue to use untreated water from springs; rivers and ground water as the main sources of water in the rural communities. Many developing countries are faced with a shortage of fresh water and water which is readily available for human consumption is polluted (Lehloesa and Muyima, 2000). One of the threats that developing countries are facing is the deterioration of the quality of water which is accompanied by inadequate water supply.

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2.5 Water supply in the Limpopo Province

Limpopo province is situated in the extreme north of South Africa. Although the province is one of South Africa's richest agricultural regions it is dry and is not able to supply enough water to meet the needs of the province (M'Marete, 2003). The province is dependent on surface water for industrial development and irrigation purposes (DWAF, 2006 Limpopo water summit).

2.5.1 Water-related problems in the Limpopo Province

There are many problems that have to be dealt with before everyone in the country can have clean potable water. Many people in the third world countries are still depended on streams, wells, and boreholes. Limpopo province is not excluded from such as Obi *et al.* (2007) state that Limpopo and Mpumalanga provinces are depended on surface water from rivers and dams. The DWAF (2006) support this and adds that communities do not have reliable sources of water as Limpopo Province is a water scarce province. The province depends on surface repetitive water for industrial and irrigation requirements. Ground water is also utilised for various activities but it is difficult to access because of the underlying bed rock which does not allow water to pass through (DWAF, 2004). There are porous rocks which allow water to pass through but they are only found in few areas.

Hemson (2004) reported that when the poor communities of the world are eager to overcome poverty, their quest for better life is hampered by the backlogs in the supply of water. In places where taps of water have been installed the taps are running dry. According to the census of 2001, Limpopo Province was not successful in overcoming its backlogs of water supply instead it has increased by 13% from 1996 to 2001. DWAF (2007) states that in 2006 3, 4 million people were without

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access to potable water. Despite all efforts that have been put in place to insure that there is enough water for the majority of the population in South Africa the country still experiences a backlogs which was estimated to be 6, 97 million people in April 2007. When the study was conducted, Limpopo Province was leading with a backlog of 24% as compared to the Western Cape with the least backlog of 3 % (Hemson, 2004). The number of schools which were without water was 672. (Limpopo Province growth and development strategy, 2004) states that the vision of the province is to achieve economic growth and to meet the basic needs of people in provinces. Therefore to be able to improve the quality of life in the province, communities should have access to clean water although it is relatively scarce.

2.5.2 Water management and demand in the Limpopo Province

The prosperity of the country depends on the availability of water. When a country has water, it utilises the water for development purposes. Water and other natural resources are essential for economic growth and to improve the quality of life. The DWAF (2004) believes that proper management of water is vital for transformation. The study done by Haigh, Fox and Coleman, (2010) state that IWRM aims to improve aspects of water resource management, and to be able to fulfill this aim, it is imperative that it looks into the way water is collected from different sources of water in the country while taking into consideration how the water is stored after it has been collected. When there is poor management of water, pipes can burst resulting in the loss of water being distributed to the community. The problem affects both urban and rural areas. The study points out the necessity for the rehabilitation of the water networks to help in getting to the root cause of leakages.

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2.5.3 Climate change and water supply in rural communities of the Limpopo Province

Lack of water to cater for the growing population in developing countries is a crisis. King Ramkisoon, Clues-Godt and Adeel, (2007) say that the provision of water remains the responsibility of the government. Yet the supply of water in the Limpopo Province remains inadequate. This is indicated by the findings in a study conducted in Tshikombani in the Vhembe District where members of the community wanted to bridge the gap of water supply in their village. To solve the problem, villagers took an initiative which was beneficial to the community of Tshikombani. Funds were collected from the villagers to go towards paying for accessing water from the mountain stream (Malzbender, Goldin, Turton and Earle, 2005). This is an exceptional community that managed to install a self-financed water supply system. Other Villages in the same district are not fortunate enough to have such a stream nearby. When they have such a stream, it is difficult to raise funds as some of the community members might not cooperate in raising funds for such a venture. Other areas in the Province receive water from the local authorities.

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Ladki, Seshoka, Faysse, Levite and Van Koppen, (2004) state that in 2003 there were 18 boreholes and only three were provided with electric pumps. At the time the study was being conducted only one was working. The other eleven water pumps were operated by hand and they were not functional. The remaining four water pumps were on unfiltered boreholes. Lastly, the study revealed that the Seokodibeng village in the Sekhukhune District has four reservoirs but only one is functional. Although the other reservoirs are in good state they are not utilised to supply water to the village. Given the different situations of water problems in the province it is important to conduct a study in the Chavani area in order to understand their main problems that have led to the collapse of the water supply in this village.

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Ziervogel, Taylor, Thomalla, Takama and Quinn, (2006) state that floods and drought are the main features of South African climate. Limpopo Province is a particularly dry province and is unable to meet its water needs from local supplies. Various dams are under construction including the Nandoni dam which has been completed in the Vhembe District. The dam has been contracted for irrigation and domestic purposes. According to Ziervogel *et al*. (2006), water is a limited resource in the Mohlotsi and Ga-Selala village and the problem affects the households in the area. There is inadequate rainfall in the area which has an impact on harvest as crops fail and the price of food increases.

Makhado Municipality as the water service authority around Chavani indicated that in some areas under Makhado villages there were boreholes which were drying up; most rural communities do not have access to clean water at household level (IDP, 2012). According to Fortin, (2009) there was a reservoir which was built to supply water to the community of Chavani village the water was pumped from the reservoir to the borehole in the village. However when the study was conducted in 2005 the community of Chavani were experiencing water problems. It was stated that pipes were destroyed by municipal workers who were building a larger reservoir in the village.

Furthermore, another pipe was damaged by one of the household when digging the foundation for their house as the stand is located next to the reservoir (Fortin, 2009). The studies conducted in Chavani indicated that there was a gap that had to be investigated with regard to the water situation in the village. Finding out how the community copes given the scarcity of water in the area and what was done to solve the problem. According to the Vhembe Municipality (IDP, 2007) there are two forms of water that is utilised in the district. The area mostly depends on surface water and ground water. Community members indicated that they were willing to engage in agricultural activities but they do not have sufficient water to plough as a result the land is not cultivated. Agriculture is the life blood of rural economies yet the community of Chavani cannot engage in such activities as a result of scarcity.

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2.6 Conceptual framework

The study focus is on factors that led to the collapse of water projects in the rural areas. There are various factors that affect the availability of water in the rural areas of South Africa. Based on the importance of water as a resource, the conceptual framework of this study will focus on water as a resource which affects the whole community. Whenever there is a shortage of water in the community, conflicts arise in the communities. Water shortages are associated with a wide spread water borne diseases.

Water Resource: Water is a limited resource which has unlimited use. There are various economic activities which lead to the demand for water in the country. Industrial development and farming compete for the use of this scarce resource. There is a need to address problems which are related to water scarcity for without water where communities live, the health and livelihood of families are affected (Manyanhaire *et al*, 2009). When the standard of living of communities improves so is the demand for water. To be able to address the obstacles with regard to water supply it is important to include community members as they are a key constituent in the paradigm of water supply and development.

Gender Dimension: The dimension of gender is important as one cannot write about water-related problems without including women and children. These are the beneficiaries of water projects and they should be included in their rightful place when discussing water issues (Parry-Jones, 2002). As they play a vital role in the provision of water to the households. They are also knowledgeable with regard to the quality of water and its source in the community yet they are not involved in the technical side of maintenance and operation of the water pump in the communities where they live (Malzbender *et al.*, 2005). Institutional arrangements and management of water are pivotal in addressing the problems of water in society. Therefore there is a link between gender and the social side of the community, the institutional arrangement is also linked to the technical dimensions which affect the water supply.

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Social side: Water has a social value in all the sectors of the economy and institutional arrangements are influenced by gender involvement in coming up with solutions to the problems that emanate from a shortage of water in the community. Social institutions are interrelated to the technology that is used to insure that water is readily available when it is needed for different activities in the rural communities.

Technical Dimension: The introduction of technology that is user friendly is essential for the management and maintenance of equipment. Technological equipment installed should be appropriate for such an infrastructure and meanwhile the technicians who are responsible for maintenance should have relevant skills and work closely with the communities (Nealer, 2009). When communities are not involved in the maintenance and operation of the equipment such as the water pump, Inefficiencies might arise as community members might feel that they do not own the project. This might lead to project failure (Louw, 2003). The technical dimension of water is interrelated to institutional arrangements together with the management of water. This relationship relates also to the community as technicians have to work in harmony with the communities.

Community Participation: Participation is one way in which beneficiaries and stakeholders come together to make decisions with regard to the planning, implementation, monitoring and decision making (Donker, 2003). When communities are involved, they feel ownership of the project. When addressing problems, communities are able to look at the relationship that is there between water resource, gender, institutional arrangements, technological developments and the communities themselves. Water development should be based on community participation involving all relevant stakeholders, community leaders, the youth, men and women. Planners and policy makers at all levels must work together to achieve the goal of having a running water system in the area. Figure 1.1 below is a visual representation which was designed for the conceptual framework.

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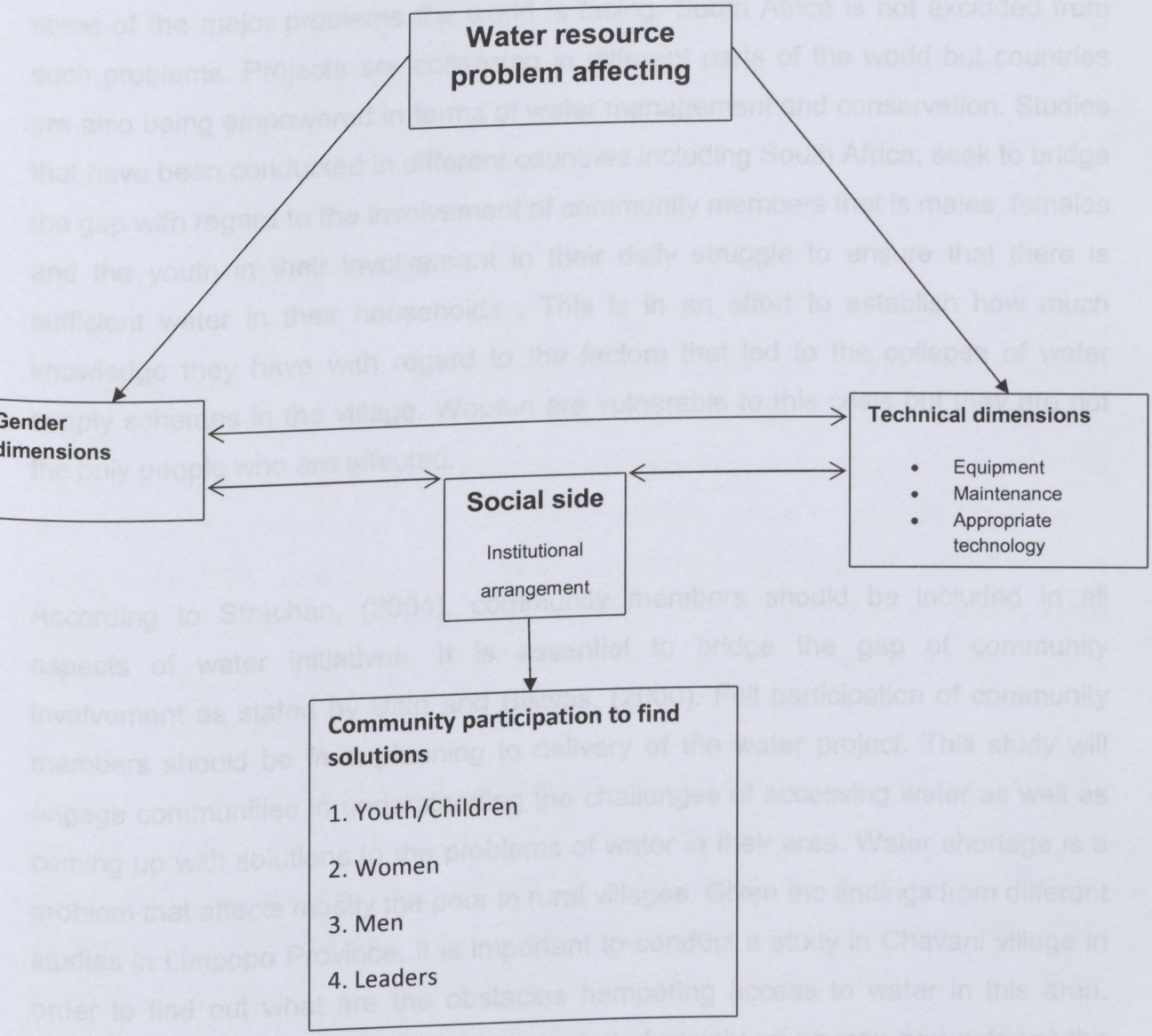
Figure 1.1 Conceptual Frame Work



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2.7 Summary

The argument from different studies is that water is a vulnerable resource that has to be sustained and managed as it is life giving and it is needed for development to take place in a country. Climate change and global warming have been cited as some of the major problems the world is facing. South Africa is not excluded from such problems. Projects are collapsing in different parts of the world but countries are also being empowered in terms of water management and conservation. Studies that have been conducted in different countries including South Africa; seek to bridge the gap with regard to the involvement of community members that is males, females and the youth in their involvement in their daily struggle to ensure that there is sufficient water in their households . This is in an effort to establish how much knowledge they have with regard to the factors that led to the collapse of water supply schemes in the village. Women are vulnerable to this crisis but they are not the only people who are affected.

According to Strachan, (2004), community members should be included in all aspects of water initiatives. It is essential to bridge the gap of community involvement as stated by Uitto and Biswas, (2000). Full participation of community members should be from planning to delivery of the water project. This study will engage communities in understanding the challenges of accessing water as well as coming up with solutions to the problems of water in their area. Water shortage is a problem that affects mostly the poor in rural villages. Given the findings from different studies in Limpopo Province, it is important to conduct a study in Chavani village in order to find out what are the obstacles hampering access to water in this area. Studies that were conducted have concentrated mainly on women and girls yet the water issue affects everyone in the community. This study seeks to involve everyone in the community.

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CHAPTER 3: RESEARCH METHODOLOGY

3.1 Introduction

Research methodology pertains to the process of collecting quality and relevant information through the use of various appropriate data collection methods. The purpose of this chapter is to show how these techniques were employed to interact with respondents in their natural setting so as to gather the required data for the purpose of the study.

3.2 Description of the study area

The study was conducted in Chavani village which falls under the Makhado municipality. Vhembe District has 4 local municipalities which are Thulamela, Musina, Mutale and Makhado. Makhado municipality is situated in the town of Makhado at the foot of the Soutpansberg mountain range in Limpopo Province of South Africa. The area covered by Makhado Municipality is 16,000 km^2 in a fertile region where Tropical fruits are produced. Chavani is part of the Nkhensani Tribal Authority, which is made up of 5 villages, namely Riverplaas, Mbokota, Bokisi, Chavani and Nwaxinyamani.

The Nkhensani Tribal Authority is situated 40 km from Makhado on the way to Giyani and 10 km from Elim. The village lies below Ribolla Mountain. The climate is subtropical with mild moist winter and wet warm summer. The area experiences rainfall between October and March. There are perennial rivers flowing into the Ritavi River (Klein Letaba) to the south. The current water sources of water for Chavani village are the Albasin dam and the Middle Letaba dam. Community members are engaged in livestock rearing especially cattle and cultivation for maize and ground nuts.

However there is insufficient land for grazing as more land is allocated to community members to build their houses. The area has relatively limited supply of water which

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does not meet the required minimum (RDP) for water. According to the RDP requirements water provision should be within 200 m from the household. Most of the villagers in the Vhembe district are served by communal taps, boreholes and various water sources such as underground water sources which include fountains and springs. The population of Chavani was about 8 871 (Statistics South Africa, 2009).

Table 3.1 below shows the different sources of water in the Limpopo Province, Vhembe district, Makhado municipality and Chavani village.

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Table 3.1: Water situation in the study area

	Limpopo Province	Vhembe District	Makhado Municipality	Chavani village
Piped water inside dwelling	123849	44906	7865	18
Piped water inside yard	383353	81770	39026	733
Piped water on community stand: distance 200 m from a dwelling	192852	137676	22426	170
Piped water in community stand: distance greater than 200 m from a dwelling	285588	7737	31410	514
Borehole	64851	7561	2415	52
Spring	26646	5433	2250	97
Rain – water tank	3269	147	164	6
Dam/pool/stagnant water	23562	642	816	27
River/stream	75637		1522	3
Water vendor	21826	847	319	-
Other	48930	469	5314	254
Total	**1223717**	**287188**	**113527**	**1874**

Source: (Statistic South Africa 2009)

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3.3 Research design

The research design is a set of guidelines and instructions to be followed in addressing the research problem. Mouton (1998) states that research designs are a blueprint of how the researcher intends to conduct the research. The design focuses on the logic of research, looking into the importance of evidence required to address the questions adequately.

This study combined the use of qualitative and quantitative designs which Saunders et al., (2012) consider a simple mixed method research design in order to acquire a more complete understanding of the impact of the shortage of water in the Nkhensani Tribal Authority. As adapted from Saunders et al. (2012) Fig. 3.1 shows the layers of research design/research onion.

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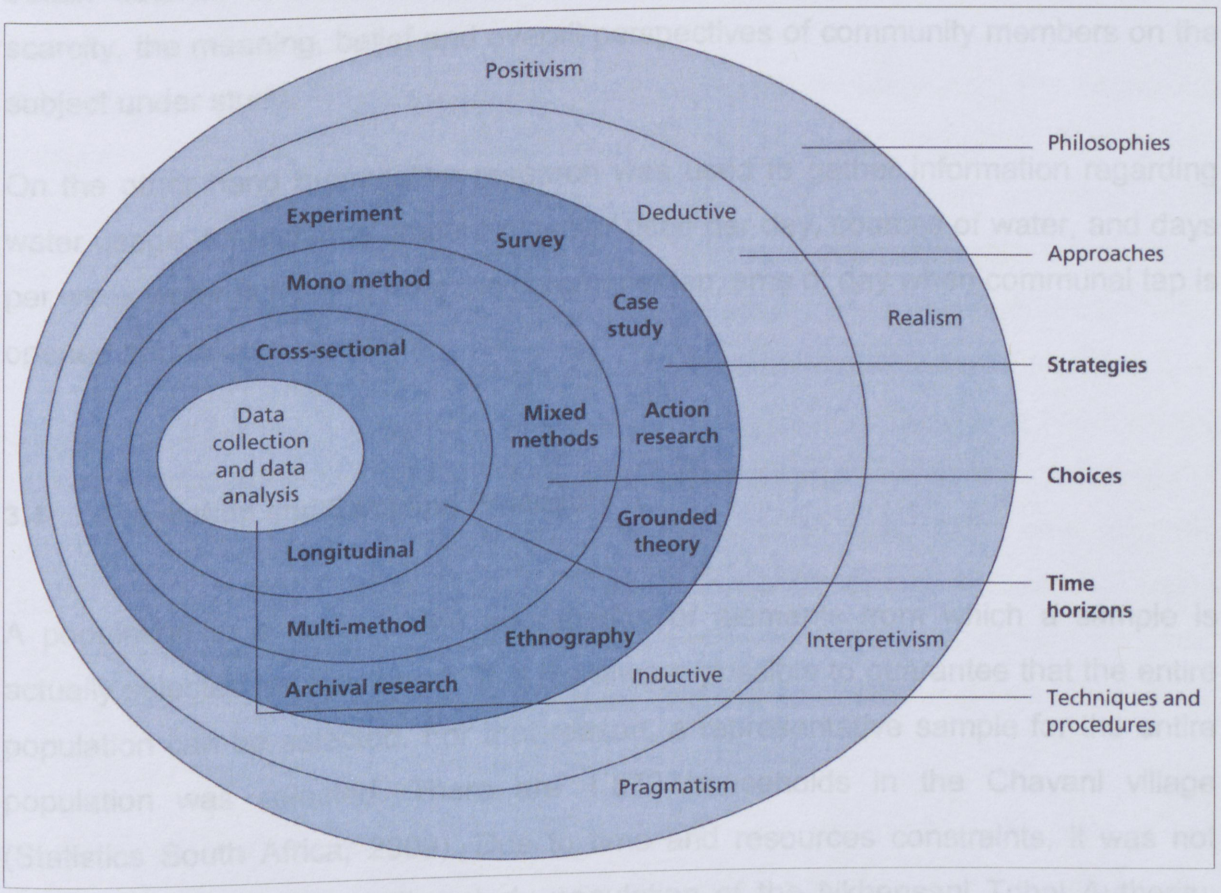
Figure 3.1: The Research Onion



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On one hand, qualitative research was adopted for this study because of its flexibility in enabling to get a deeper understanding of the subjective nature of the water situation in the area from the community's perspective. Thus the study managed to obtain detailed information from the respondents on the phenomenon of water scarcity, the meaning, belief and overall perspectives of community members on the subject under study.

On the other hand quantitative research was used to gather information regarding water usage, for instance amount of water used per day, sources of water, and days per week water is fetched from the communal tap, time of day when communal tap is opened and related variables.

3.4 Population and Sampling Procedure

A population in a study is the aggregation of elements from which a sample is actually selected for a research. It is not always possible to guarantee that the entire population can be selected. For that reason, a representative sample for the entire population was selected. There are 1,873 households in the Chavani village (Statistics South Africa, 2009). Due to time and resources constraints, it was not possible to include the entire study population of the Nkhensani Tribal Authority. Therefore, the study targeted community members and key informants such as the chief and councillor to participate in the study.

The respondents in the study included community member's males and females as well as high school learners as primary sources of information for the study. This is on the basis that those groups are directly affected by the shortage of water in the area in which they live. Members of the community who are responsible for operating the water resource infrastructure were also interviewed. The ward councillor and the traditional leader ("the Chief") were interviewed as they are knowledgeable about the extent of the impact of water situation and related issues in the village. The water personnel from Makhado municipality who have insight into the programmes and

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policies on water were also included. It was essential to include the Village Water Committee (VWC) since it works closely with the community and is well informed about the water problems that are experienced in the community.

The study combined non–probability and probability sampling. The sampling procedure that was used was stratified sampling and cluster sampling. Twenty four learners were selected from Shinguwa High School using probability sampling. A list was compiled for learners who come from Chavani village. Learners were further divided into different blocks, Chavani consist of six blocks which are Mountain View, Xichulu, and Maphanyi, Wisani and White city and Phandlule. A list of learners from different blocks was compiled. They were further divided into two strata one for male and the other one for females. Numbers with three digits were written on a piece of paper and they were put in two different bowls for each block - one bowl for male and the other one for female. Learners who chose a paper with the last digit being one or two were included in the study; every learner from this block had an equal chance of being included in the study. Four learners were selected from each block two from each stratum that is two males and two females.

Furthermore sixteen community members were also required to participate in the focus group discussions which included both males and females .To that end, the chief called a meeting where he explained the purpose of the meeting to the community members. Once that was done community members who wanted to take part in focus group discussions were selected on a voluntary basis. Names and contact numbers were written on a paper to help with locating the respondents.

The respondents who formed the population that responded to the questionnaires were selected from the households. Community members who were selected to participate in focus group discussions were not part of the respondents who completed the questionnaire. Chavani village consists of six blocks and all the blocks have the same characteristics with regard to the shortage of water. Three blocks were purposively selected for the study. The blocks which were selected were White

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city, Mountain View and Wisani because of the proximity to each other which provided the convenience to transverse the areas with ease. Twenty households in each block responded to the questionnaire. This was done so that all the important areas of the village were covered. As such, areas which often receive water were part of the study together with those areas which do not receive water at all. Table 3.2 below shows the respondents who took part in answering the questionnaires.

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Table 3.2: Category of respondents of this study

Category	Numbers	Data collection tool	Purpose
Villagers Male, Female Adults and Youth	60 households	Structured questionnaires	For an 'insider' perspective. These are the beneficiaries.
Villagers, Male and Female	2 Focus groups with 8 members in each group =16	Interview guide	To confirm or dispute findings from the household questionnaire.
High School Learners	3 Focus groups each with 8 members in each group = 24	Interview guide	To have a learner perspective and areas of consensus/disagreement
Chief	1	One on one interview	Key informant
Ward councillor	1	One on one interview	Key informant
Village Water Committee	1	Unstructured interview and an interview guide	in-depth views on water situation
Total	103		

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3.5 Data collection techniques

A letter was written to the Nkhensani Tribal Authority to ask for permission to conduct research in the area (see Appendix 1). The local chief called a meeting where all structures of the community leaders were present and explained the purpose of the research to all who were present. The chief then informed the community members about the research that was to be conducted in the village. Another letter was sent to the Department of Education to ask for permission to include high school learners from Shinguwa High School who stay in the Chavani area (see Appendix 2). The following method was used to collect data:

3.5.1 Direct observation of water sources

Direct observation. This method is distinguished from participant observation in a number of ways. Firstly direct observations do not typically try to become participants in the context; they strive not to be biased. Permission to take photos was sought from members of the community who came to collect water. A consent form was signed by members of the community who agreed to be photographed. While observing people coming to collect water from the well, spontaneous unstructured questions were asked.

3.5.2 Unstructured interview for leaders

One on one interviews were arranged between the researcher and the traditional leader in the village, a ward councillor and a member of the village Water Committee. In this instance, an interview guide was used. Unstructured interviews were also arranged for machine operators and personnel from Makhado Municipality.

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3.5.2 Semi – structured questionnaires for community Members

The study used semi-structured questionnaires for community members. As such, the questionnaire had open-ended and close-ended questions.

3.5.3 Focus group discussion for community members and learners

A meeting was arranged for focus group discussions at the tribal office in Chavani and an interview guide was used. Members of the community who participated in focus groups discussions were divided into two groups; one for women and another one for men. Each group had eight members. Another venue was arranged for high school learners and their discussions were conducted at Shinguwa High School. The learners were divided into three groups – one for males the other one for females and a third group for mixed gender. The choice of three different groups was to obtain the various perspectives of different groups regarding the problem and unpack areas of contestation and areas of agreement.

A semi-structured interview guide designed for the focus groups allowed the respondents to explore the issue of water in the area of study (De Vos, Strydom, Foucher, 2002). Follow-up questions were asked to probe responses where there was lack of detail. The use of multiple sources of data collection was used to increase the reliability of findings. Thus, this form of data triangulation facilitated obtaining various pieces of information from different perspectives. In this study, therefore the concept of triangulation was used to designate a conscious combination of quantitative and qualitative methodologies (De Vos *et al.*, 2002).

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3.6 Data analysis

Data collection goes hand in hand with analysis in order to build a coherent interpretation of the data (De Vos *et al*. 2002). Data analysis was guided by initial concepts to develop an understanding and modifying the data.

3.6.1 Data analysis for direct observations

Firstly, data was preliminarily analysed on the research site during observations. This helped to write down the information while it was still fresh. The second phase involved data analysis away from the site. After every observation, data was analysed at home where different cases were compared with regard to the similarity principle. To that end, data with similar themes were grouped together. It also involved looking at pictures and writing down important information using thematic analysis. This meant going back and forth to find out and to understand dynamics of the water situation in the area. Thus, the contrast principle was important in this regard. Raw data was eventually transformed into a standardised form.

3.6.2 Data analysis for Interviews

Data analysis for interviews was done away from where the interview was conducted using thematic analysis. A table with the different themes that emerged from the discussions was designed. This method was used to search for mutual exclusivity between the emerging categories of information. The following columns were included a local chief, a ward councillor and the village water committee member. Ticks were allocated for each theme provided the interviewee's response was related to such a theme.

3.6.3 Analysis for questionnaires

Priori codes were designed for the questionnaires of community members. Each response for closed-ended questions was given a code. The questions were edited

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and given a unique number in the identified file. Data analysis was first done using an excel spread sheet in which different codes under each question were entered into a spreadsheet. When that was done, the data was further analysed using the Statistical Package for Social Science (SPSS) version 20 of 2011. As such frequencies were generated in order to reflect calculated proportions from the information, tables which showed percentages were presented under specific headings. Pie charts were also used to present the different responses that emanated from the questions.

3.6.4 Procedure followed to analyse data for focus group discussions

Members of the focus groups did their discussions while a scriber was selected to write down the information in order to note the conversation for similarities/differences that emerged from the different groups. One question was handled at a time. If there were additions every group was given a chance of adding until all the points were exhausted .All data from the focus group discussions were analysed on site using thematic content analysis.

Data analysis continued away from the scene where themes were developed under each question. Statements which were closely related to certain themes were put together. A table with the different themes was created. The following headings were used. The first two columns were for community member's male and females. The third and fourth column was allocated for male and female learners. The last column included both male and female learners. Ticks were allocated on a particular theme provided the group responded to such a theme.

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3.7 Ethical considerations

Ethics is typically associated with morality as both deal with matters of rights and wrong (Babbie and Mouton, 2005). Details regarding informed consent, voluntary participation, no harm to participants, anonymity and confidentiality, deceiving subjects and honesty with professional colleagues. Which were observed in this study is elaborated below.

3.7.1 Informed consent

Each participant was given a letter which had a consent form that explained the purpose of the study. The respondents read and voluntarily signed the form before filing in the questionnaires. Written consent was also obtained from the respondents consenting to pictures being taken of them for the purposes of this study.

3.7.2 Voluntary participation

As the code of ethics of research states that, respondents must participate voluntarily, the selected households participated on a voluntary basis and they were not forced to participate in the study. The concert form which states clearly that participation is voluntary was attached to the questionnaires that were given to all the stakeholders and households.

3.7.3 No harm to participants

The research did not cause any known injury to the respondents that were selected to be participating in the study during all phases from design, implementation and results. The respondents were assured of this upfront. The questions were appropriately worded so as to not cause any psychological injury. Additionally, the

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study did not involve any physical contact with the subjects. This is consistent with what Babbie and Mouton, (2001) claim that regardless of whether they volunteered for the study or not, no harm should be done to participants.

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3.7.4 Anonymity and Confidentiality

Respondents were informed of their rights for confidentiality and protection of their identity. The researcher's findings in the study are presented honestly without distortion.

3.7.5 Deceiving subjects

As a researcher it is important to identify yourself to the respondents, explain the purpose of the research. I introduced myself as a researcher to the participants.

3.7.6 Honesty with professional colleagues

This study reports all the findings in a complete and honest fashion without misleading others about the nature of the findings. All the findings were disclosed relating to the study whether negative or positive.

3.8 Summary

This Chapter looked at the research design, population, sample and data collection and analysis methods used in the study. Both qualitative and quantitative research techniques were used. Data was collected using observation, semi-structured questions for focus groups discussions and one-on-one unstructured interviews with the necessary justifications. Chapter 4 will present the findings.

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CHAPTER 4: PRESENTATION OF FINDINGS & DISCUSSIONS

4.1 Introduction

Triangulation a combination of both quantitative and qualitative techniques was used in this study. This section presents findings from the data collected using qualitative techniques. The technique used, is the focus group discussion. A neutral venue was arranged for community members to engage in focus group discussions and interviews. Two groups turned up for the discussions, a group of eight males and another of eight females. Learners from Shinguwa high school had their group discussions at the school. Twenty four learners were selected for the group discussions. These were divided into three groups of eight. One group had males only, the other had females only and the third group had both male and female learners.

4.1.1 Current water situation in Chavani village

The problems that were of particular concern to the community were problems related to the exorbitant cost of water and the access time to the communal water taps. The community members mentioned that water from the communal taps was only accessible between 0900 hours and 1600 hours, time during which formally employed community members have to be at work. Another challenge that was mentioned by the community members was that of the small number of communal taps that are sparsely distributed such that community members have to travel long distances to collect water hence some community members opt to use unsafe water sources like wells that may be nearer. These problems greatly challenged agriculture. Community members expressed the concern on the amount of money spent on accessing water arguing that it could be used productively on other means to improve their livelihoods. The youths' main concern was that they had to use time that should be dedicated to their books to collect water after school. Villagers were also concerned that the water was neither clean enough nor sufficient for household purposes.

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4.1.2 Possible solutions to the water crisis in the area: villagers' perspective

When asked about their perceptions of the water supply challenges and suggested solutions, villagers in the focus group discussion felt that there is a need to call a meeting to discuss the issue. They also felt that new boreholes must be installed and old ones fixed. They also suggested repairs of damaged water pipes and expansion of the pipeline system to improve water distribution.

4.1.3 Institutional arrangements

In discussing the current institutional arrangements for the water supply in the area, villagers painted a picture of a web of players and activities involving:

- Communal taps being opened twice per week
- Some community members having connected water pipes to the well which is on the Ribolla mountain
- Water being distributed by trucks from the municipality
- Collecting water from different wells in the community
- Buying water from neighbours who have boreholes

4.2 A learner's perspective on the water situation

4.2.1 Introduction

Because learners are relevant stakeholders as collectors and users of water, focus group discussions were held with male and female learners at Shinguwa High School. Below are some of the perceptions of the learners on the issues regarding the water situation at Chavani.

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4.2.2 Current water situation in the area

When asked about their thoughts regarding the water supply situation and challenges in the Nkhensani Tribal Authority, the learners mentioned a shortage of water supply in the communities. There was also a challenge for those who had to buy water from borehole owners, as these boreholes were only accessible at specific times that were not always conducive for the learners who have to attend classes. Other challenges mentioned by the learners included very poor water supply from the taps, few water taps, broken water pipes (see Figure 4.1) and the sparse distribution of water taps leaving other community members having to travel over long distances to collect water or resorting to fountains. The learners were concerned that the community leaders could not find a solution to the problem as evidenced by the persistence of the problem.

SOURCE: Primary Data

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Figure 4.1: A broken water pipe



SOURCE: Primary Data

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4.2.3 Challenges and possible solutions to the water crisis in Chavani village

Learners expressed their thoughts and concerns regarding the water situation. Those learners who came from homes/ households that had to buy water from borehole owners revealed that they could not always afford to buy water and there were times when they would have no water for food preparation and had to go to school on empty stomachs. The boreholes are not accessible during the holidays and this presents a challenge to the water users. Blame also went to the community members for poor management. Below is a learner's expression of concern on the water problem:

In the areas where we live, we meet different challenges but we all complain about the water supply. Sometimes they don't open water for two months and we must buy water (Learner 1). The learners offered some solutions to the water problems bedevilling the community. One of the solutions looks within and identifies a key stakeholder as encapsulated in the following excerpt: We must fix our water pipes and the mayor must make sure that we get water and they must hire someone who will always be at work and supply us with water (Learner 2). Other suggested solutions included the sinking of more boreholes, installation of more water pipes and pumps to improve water availability. The youth were prepared to raise money for the installation of water taps in each homestead or five taps in each zone/ area. The youths mentioned that they had even considered a non- governmental organisation that supplied household with one tankful of water per week as a way of avoiding having to travel long distances from water.

4.2.4 Institutional arrangements

When it came to discussing the current institutional arrangements for the water supply in the area, the learners mentioned that some people had to buy their own taps. Those with boreholes were trying to help those who did not have access to water. Community members are well aware of the days and times when water is accessible in their different areas. The tribal office was identified as useful and the

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community members in general were helping each other. Some households buy water for R1 per 25 litres while others have to fetch water from the fountains. Those who are fortunate enough to stay in the blocks where communal taps are in working condition, collect water from the taps. The municipality also delivers water weekly to the community. The community members also contributed money and connected pipes to the well up the mountain which supplies them with water.

4.2.5 Perceptions of learners on the effectiveness of the existing interventions

According to one of the learners, water, which was previously unavailable, became available every alternate day following petitions by the community to the relevant authorities. A community vote of no confidence resulted in the changing of the personnel responsible for water supply. Having outlined the prevailing situation, the learners suggested the installation of water tanks in each zone/area. They also suggested that trucks could be used to bring water from other sources to fill up the tanks. Another suggestion from the learners was that water taps be installed in each street to ensure that community members get access to running water within reasonable distances. The learners also suggested a meeting with the mayor where they could present the challenges regarding water supply and expressed faith in that if the mayor is made aware of the challenges, she could help come up with ways to lessen the water supply challenges.

Some learners felt that there is need to call for a meeting in the village to discuss basic techniques on saving water and conservation such as not leaving their taps running after use and educating those with flush toilets or bathrooms to use water wisely. Water should be in the hearts and minds of everyone. It is also recommended that each member of the community should always use water wisely and show concern and regard water as a precious resource. Others believe that government strategies are not effective and result in scanty distribution of water such that even truck delivered water is poorly distributed and some community members

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end up travelling long distances for the water. The learners applauded the municipality's initiative to repair water taps and to provide truck delivered water.

Most of the comments highlighted issues concerning nepotism with regards to water supply issues. One of the learners made the allegation that community leaders first considered their home areas when making plans for water supply disregarding other areas. The learner alleged that Maphanyi community was serviced by water delivery trucks while the neighbouring community Phandlule was not provided with the same service. As a solution to the alleged problem, a different learner proposed selecting the person responsible for water supply from none of the affected villages in order to avoid favouritism in water supply and to ensure that all areas are awarded the same privilege. In general, the learners were concerned about the water situation.

4.3 The perspective of community members from Nkhensani Tribal Authority

4.3.1 Water situation

Villagers reported serious water shortages. People are suffering because of water shortage. The old borehole that supplied water to the community was no longer working. They pointed out that during summer there is a lot of water in the rivers that the villagers use for washing, bathing, and for watering their livestock. However when it is hot the water evaporates.

4.3.2 Challenges and institutional arrangement in the village

The villagers' perspective of the challenges in the area:

- Boreholes that supplied water in the village were destroyed.
- Pipes that supplied water from the dam were damaged.

Different institutional arrangement came up in the discussion which included the following arrangements:

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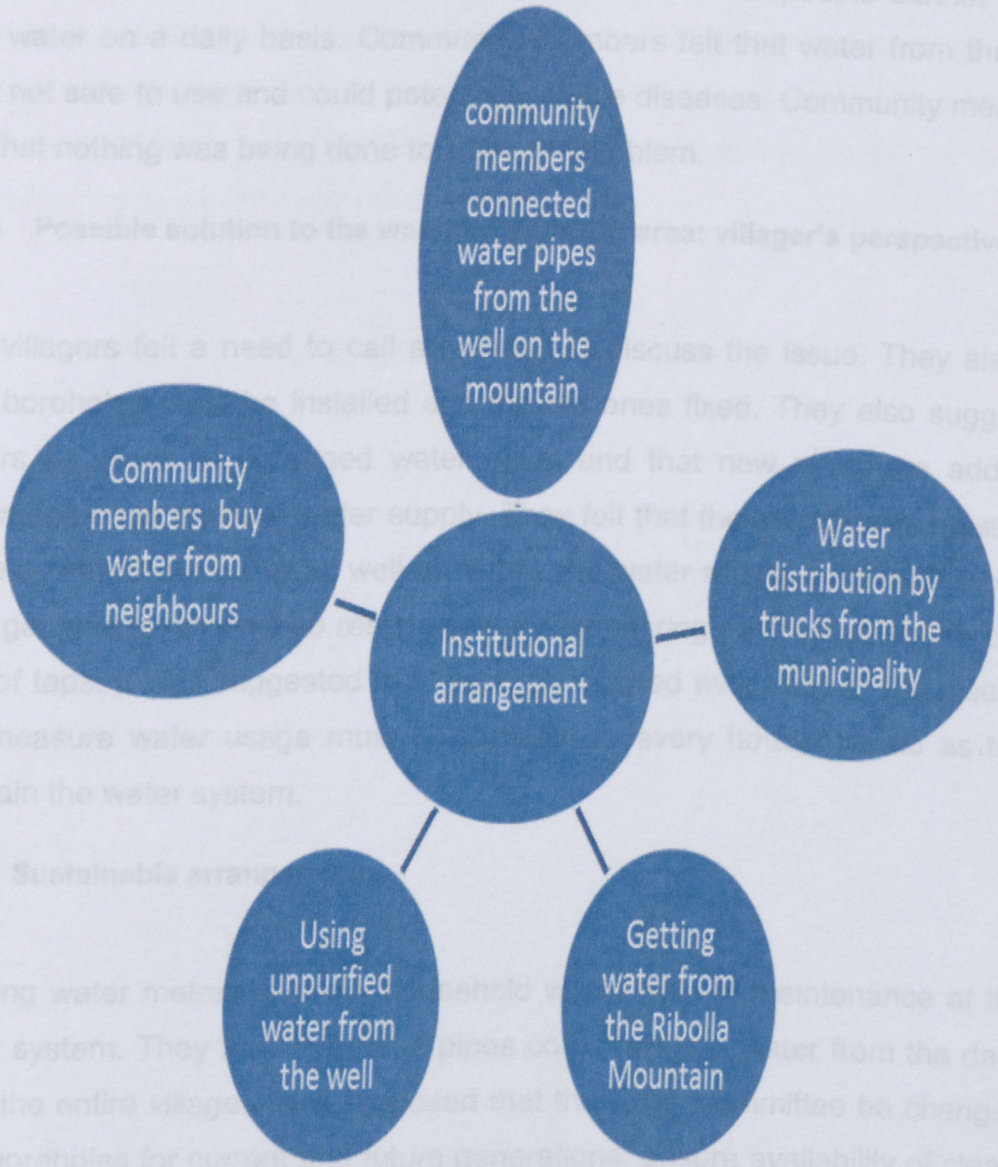
Figure: 4.2 Institutional arrangements



Source: Primary data

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4.3.3 Effectiveness of the existing interventions

The existing intervention is not effective because some people cannot manage to buy water on a daily basis. Community members felt that water from the mountain was not safe to use and could potentially cause diseases. Community members also felt that nothing was being done to solve the problem.

4.3.4 Possible solution to the water crisis in the area: villager's perspective

The villagers felt a need to call a meeting to discuss the issue. They also felt that new boreholes must be installed and the old ones fixed. They also suggested that repairs be made to damaged water pipes and that new pipes are added to the existing pipes to improve water supply. They felt that the municipality must also play a role by supplying water as well as renew the water supply system.The community must get people who will be responsible for monitoring communal taps to cap up the theft of taps. It was suggested that water be opened every day of the week. Metres that measure water usage must be installed in every household so as to help to maintain the water system.

4.3.5 Sustainable arrangements

Installing water metres in every household would help in maintenance of the water supply system. They also felt that if pipes could be fixed water from the dam would get to the entire village. They proposed that the water committee be changed. Build more boreholes for current and future generations; ensure availability of clean water; Installing water taps on each and every street or house; Make connections from the wells on the mountain to the water machine that can channel water to houses and taps on the streets; Water taps should be opened every day, on time and delay closing. Trucks should deliver water to the community at least three times in a week.

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Table 4.3 below summaries the key themes that emerged based on the perspectives of the key stakeholders who participated in this study. Evidently from the responses, all stakeholders identified that they are experiencing water shortages, damaged pipes are a problem, and current interventions can be considered to be ineffective. Sinking of more boreholes, fixing the pipes and borehole as well as installing water taps were viewed by many to be some of the solutions to the problem as overwhelmingly identified by the stakeholders.

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Table4. 3: Key themes that emerged from the study by respondent group

Water situation	Male leaners	Female learners	Male and female learners	Community Males	Community Females	Tallies
Described as bad/with no solution	√	√		√		3
Suffering as a result of the bad situation				√	√	2
Experiencing water shortages	√	√	√	√	√	5
Challenges						
Numerous broken pipes			√	√		2
Lack of access to water			√			1
Time of opening communal tap is not appropriate		√				1
Water situation	**Male leaners**	**Female learners**	**Male and female learners**	**Community Males**	**Community Females**	**Tallies**
Lack of money	√	√			√	3
Community members cannot engage in agricultural activities	√					1
The distance that is travelled to collect water is long	√					2
Perspective						
Damaged pipes have not being fixed	√	√	√		√	4
Municipality must arrange trucks to deliver water	√		√		√	3
Institutional arrangement						
Communal taps are opened twice per week	√		√			**2**
Water is collected from the well	√			√	√	3
Community members buy water from those who have boreholes	√	√	√	√		**4**
Municipality trucks deliver water		√				
Water situation	**Male leaners**	**Female learners**	**Male and female**	**Community Males**	**Community Females**	**Tallies**

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			learners			
Intervention						
Not effective	√	√		√	√	4
Effective			√			1
Suggested solutions to the problem						
Hold meetings to discuss water problems		√	√			2
Ensure better water management	√		√			2
Fix the pipe and borehole	√	√	√	√	√	2
Install water taps	√	√	√	√	√	2
Water situation	**Male leaners**	**Female learners**	**Male and female learners**	**Community Males**	**Community Females**	**Tallies**
Source funding for the fixing of boreholes and water pipes		√	√			2
Open water tap daily		√				1
Sink new borehole	√		√	√	√	4

Source: Primary data

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4.4 Observation at wells

Each well that was visited had a name associated with a particular family.

4.4.1 Observation at Makhaveni well

The first well visited is called Makhaveni which is a surname of a family which dug the well right next to their home. Among the adults, one male and three females collected water. Among the youth, one male and two females; and among the children, two boys and one girl came to fetch water. It took adults about 30 minutes to collect water. As for the youth it took about 30 minutes to one hour to do the same. For young children they needed as much as two hours. The reason being that when they go home the water is heavy so they have to take breaks along the way. Their family sizes ranged from 4-10 and collection times ranged from 2 to 7 times per week. All respondents claimed that they did not boil their water before use. The young girl (see Figure 4.3) said she carries water on top of her head and came twice every day after school to collect water.

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Figure4.3: Girl fetching water from a shallow well



Source: Primary data

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While observing, some questions were asked such as whether children have sisters or brothers at home who also collect water. They said some of them refuse to collect water hence they are responsible for collecting water. The boy aged 13 said at times he falls asleep at school after collecting water in the morning before coming to school. From the same observations, it became clear that children as young as 9 years come and collect water. Some carry the water on their heads while others make use of wheel barrows which carry up to 3 water containers of 25 litres each.

Besides observation, some respondents were also interviewed at the well.

Case 1: A woman was collecting water; she claimed to collect 125 litres of water 3 times per week for a family of six. She does laundry for the family once a week just next to the well. However she does not do the baby's laundry there she collects another 50 litres of water for the baby's laundry. It takes her about 20 minutes to travel to the well.

Case 2: The girl comes from a family of five. She is in Grade four and collects water after school. She does not have a wheelbarrow. She claimed she can manage to collect water twice a day.

Case 3: Another girl responded at the well. She also comes from a family of six. The girls and their mother are responsible for collecting water. Laundry is done at home. They collect 150 litres of water for laundry once a week. They also collect water on Saturdays and Sundays only for the whole week because she attends school during the week. She claimed that the water is kept in a container for the whole week and it is not boiled before it is used. When they have money, they buy from water vendors but when they do not have money, they go to the well. On Saturdays, government-sponsored water tanks sometimes deliver water to their households. During that time, they fill up every container they have. They normally collect water from the well in the morning. She also claimed that there is a lot of water in the well and the water is usually clean in the morning.

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not allowed to accumulate it took up to eight minutes fill up a single container and 25 minutes to fill up three such containers.

Case 5: Respondent five came from a family of ten with three females responsible for collecting water. The interview revealed that the community members collected water during the mornings and the evenings.

Case 6: Respondent six came from a family of seven. From this respondent's family, the people responsible for collecting water were the mother and two children aged thirteen and ten. They arrived around 6H00 only to leave at around 10H00 because the queue was long. They use 100 litres of water per day. When they have to do laundry, they come to the well and do their laundry there. Alternatively, they collected ten 20/25 litre containers just for laundry alone.

Case 7: Respondent seven came from a family of eight using 100 litres of water per day. They also bought enough water to fill up a 20 or 25 litre container for R1. The respondent claimed that the family did their laundry at the well once a week. It took 30 minutes to walk down to the well and up to an hour to walk back. In all cases, time spent fetching water was more than an hour irrespective of the size of the family and gender of the collectors.

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Table 4.4 Differences and similarities between the cases observed.

Source: Primary data

Respondents	Gender of water collectors	Number of people responsible for collecting water at home	Time spent going to the well and coming back from the well	Number of days in a week for collecting water	Quantity of water collected per week	Number of people in the household
Case 1	Female	2	1 hr.	3 days	425 litres	6
Case 2	Male	2	1hr30min	7 days	350 litres	4
Case3	Female	2	2 hrs.	3 days	450 litres	5
Case4	Male	2	1hr30miN	2 days	450 litres	4
Case 5	Male/female	3	1hr	7 days	900 litres	10
Case 6	Mother/children	3	2h30min	4 days	700 litres	7
Case 7	Female/male	2	1hr30min	7 days	700 litres	8

Source: Primary data

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4.4.2 Observation at Hlengani well

The well was situated on a mountain. There were three wells in the area but the third was nearly dry, refer to figure 4.5 below. The other two wells are in close proximity to each other. The one had clean water while the other was polluted. Water quality is of paramount importance. The quality of water of the two wells (Figure 4.6) is not the same. Though the reason for the difference is not known, it could be that the one well is protected while the other is open.

Figure 4.5: A well which has dried out on the left and the one which has water on the right



Source: Primary data

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Figure 4.6: The clean and dirty wells



Source: Primary data

Meanwhile a pipe was connected from the well to bring water down the hill. To siphon the water from the well, one of the children had to use her mouth to draw the water through a pipe. Once it started flowing, it was then connected to another pipe that carried the water to a 210 litre container down the hill. The women worked together to collect water. Some filled up a big container, while others brought wheel barrows to collect water from the big container, saving them the walk up the hill. The women stored the water at home in plastic containers. The children who did laundry at the hill reported that three women were responsible for cleaning the well. Every

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Saturday, girls younger than 14 years could be seen doing some laundry at the foot of the hill without adult supervision. The figure 4.7 below shows children doing laundry next to the well.

Figure 4.7: Children doing laundry



Source: Primary data

4.4.3 Observations at Ramanyimi and Magoro wells

Mr Phosa, an entrepreneur in the area sells water for money. He connected a pipe from a well situated on mount Ribolla. It takes about 30 to 45 minutes to walk up the

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hill to where the pipes were connected. The initiative he took to connect pipes from a well on the mountain implies water scarcity also affects males. Following connections made to Ramanyimi well that could not provide enough water, Mr Phosa went on to connect pipes to Magoro well. The water scarcity presented Mr Phosa with an opportunity to help the community get access to water while he also made money as a water vendor. He sells water to people around the village for R1 per 20 or 25 litres and R20 for a 210 litre container. Sometimes he delivers water to the households using his bakkie. He employed a lady to sell water. He claimed to sell enough water to fill up to 10, 210 litre containers per day and estimates that there are on average 15 people who come with 20/25 to buy water from him. Mr Phosa started selling water in the year 2011 and has never run out of water.

Figure 4.8: Mr Phosa, the entrepreneur





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Figure: 4.9 Water connections from the mountain



Source: Primary data

4.4.4 Observations made at Magoro well of Mountain View

A community discussion revealed that community members were aware of the water shortages in the area and had connected pipes to bring water down to the villages. In 2007 both male and female community members came up with an initiative to solve the water problem where each community member contributed eighty rands which was used to buy pipes. The male community members connected the new pipes. Initially, the Magoro well was dug by a farmer. Currently the same well that was dug with the aim of advancing agricultural activities in the community is the main source of water for the Mountain View community. However, only those community members who contributed money to buy the water pipes benefited from this well and those who did not stole the pipes. The community members lacked funds to constantly repair the pipes and the water got polluted.

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4.5 Local leadership's perspective

4.5.1 Water supply situation in Chavani village

According to the community leadership, the water situation was "very poor" in the area. They asserted that the major water sources used by the various community members were boreholes as well as the municipality deliveries that came once or twice in a month. They also mentioned that the one borehole that supplied water to Maphanyi community was challenged by occasional diesel shortages.

4.5.2 The major challenges associated with water supply

One of the main challenges the community leaders mentioned was that of diesel shortages and poor borehole maintenance. When boreholes were well maintained they supplied enough water to provide for the neighbouring Phandlule community. The other challenge they that was mentioned was lack of transport for municipality deliveries of water. It was also mentioned that the water operators were sometimes not available to open the water taps. It was also alleged that the community leaders often used resources for their own communities, disregarding others.

4.5.3 Possible solutions to the water crisis

According to the community leadership, there is lack of monitoring of the infrastructure. They suggested that there is a need to improve this aspect by those who are supposed to do so. They also urged that resources should be channeled to the relevant community and that there should be transparency between the municipality and the community. They also emphasised that communication channels should be opened such that the information reaches all the relevant stakeholders including the community. In an attempt to resolve the situation, the councillor, the chief and a delegation from the political party, sent a delegation to the

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municipality. The leaders noted that presently there are people who are conducting a survey in the area for the building of a reservoir which was included in the budget for 2012/2013. Implementation of the project will be in 2013 and it is expected that the project will be completed between 2015 and 2016.

4.5.4 Impact of water on the various stakeholders in the community

According to the community leaders, schools also experience water shortages such that schools even fail to water the flowers and grass and when there is no water at all the students are sent home even before normal knock off time. The leaders also mentioned that businesses that make use of water also suffer and this has been said to hamper progress. They also mentioned that there were areas which were used specifically for agriculture but have since been given to community members to build houses. The leaders claimed that water shortages have resulted in a decline in farming activities in the area and the functioning of businesses has also been affected.

4.5.5 Factors that led to the collapse of water projects in the community

According to the community leaders, a water project would have been implemented two to three years back had resources not been used elsewhere. However, the elders mentioned that the main cause of the collapse of the project was a lack of maintenance of the numerous leaking pipes.

4.5.6 Possible institutional arrangements to solve the problem

The leaders emphasised that if all stakeholders work together with the chief and Speak with one voice; they can solve the problem of water scarcity in the area.

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4.6 THE CHIEF'S VIEWS

4.6.1 Water supply situation in the area

The chief also maintained that the water supply situation in the area was very poor.

4.6.2 Major challenges associated with water supply

The chief also felt that the community lacked functional water sources. He also mentioned that since 1994 people have always been waiting in long queues to buy water from one old borehole or buy from those who had their own private boreholes.

4.6.3 Possible solutions to the water crisis in the area

The chief's suggestions towards resolving the water situation included the renovation of the old pipeline and sinking more boreholes to supply the community with water. He also mentioned that community leaders are trying their best to make sure that the only reservoir should supply water once a week to each block in the village.

4.6.4 Impact of water on the various stakeholders in the community

The chief mentioned that people were living in a desperate situation. There are challenges affecting the school, learners, parents and the community as a whole. To solve the problems, he mentioned that it is necessary to write a motivation to Makhado municipality to propose renovation of the old pipeline and construction of more dams in the area.

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4.7 THE COUNCILLOR'S VIEWS

4.7.1 Water supply situation in the area

The councillor had this to say as encapsulated in the excerpt below:

It is not good that some blocks do not receive water at all. We want water reticulation. According to the Integrated Development Plan water reticulation should have been implemented in October 2012. But it will be implemented as soon as pipes are connected from the Nandoni dam.

4.7.2 The major challenges associated with water supply

The councillor mentioned that there are three boreholes that supply water to the community three times per week from 8:00 hrs to 16:00 hrs in the afternoon. The councillor also mentioned that community members also get water from the wells on the mountains and communities who live in Mountain View connected pipes from the well on the mountain, citing these as the major water sources. However, according to the councillor, the major challenges were the water pipes which were reported to be too old and in a state of disrepair the two water pump machines which have been electrified but not in use.

4.7.3 Possible solutions to the water crisis in the area

The councillor mentioned that water was not delivered regularly because the municipality had a limited number of trucks. She also mentioned that water deliveries were irregular and could skip a week. She noted that when the water trucks come to deliver water they do service all the areas which do not have water.

The councillor also spoke about the team from the Department of Water Affairs and Forestry which is conducting an investigation in order to find out the extent of the problem as well as another team which will come and implement the project based on those findings.

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4.7.4 The impact of water scarcity on the various stakeholders in the community

According to the councillor, water scarcity reduced farmer productivity. The councillor also extended that water scarcity also affected other water users such as business owners and women who have to either buy or travel long distances to fetch water. The councillor went on to mention that illegal connections and lack of maintenance of broken pipes led to the collapse of the water supply system. Some of the mayor's suggestions included connecting pipes to the well on the mountain, truck deliveries of water, implementation of the water reticulation project and finally she suggested that community members who had no access to water could buy water from those who owned boreholes. Table 4.5 is a summary of the themes that emerged based on the perspectives of leaders in the community.

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Table4. 5: Key themes that emerged from the study by Leaders in the community

Local leader ship's perspective	Village water committee leader	Chief	Councillor	Tallies
The water situation				
Described as bad/poor	√	√	√	3
There are different sources of water borehole, well, communal taps and trucks deliver water	√	√	√	3
CHALLENGES				
Numerous broken pipes	√	√	√	3
Times for opening water by the water operator	√			1
Lack of maintenance	√			2
Lack of diesel to operate the water pump	√			1
Community members cannot engage in agricultural activities	√	√	√	3
Local leader ship's perspective	**Village water committee leader**	**Chief**	**Councillor**	**Tallies**
The distance that is travelled to collect water is long		√	√	2
Electrified water machines not being used			√	1
Factors that led to the collapse of water project				
Damaged pipes have not being fixed	√	√	√	3
Lack of maintenance	√	√		2
Leaking pipes	√			1

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Resources aimed at solving the problem scheduled else where	√			1
Illegal connections by households			√	1
Institutional arrangement				
Community members buy water from those who have boreholes	√		√	**2**
Municipality trucks deliver water	√		√	**2**
Impact on various stakeholders in the community				
Farmers cannot engage in agriculture	√	√	√	**3**
Businesses are affected		√	√	**2**
Schools knock off early	√			**1**
Suggested solutions				
Investigate the problem	√		√	2
Ensure better water management				
Renovate old pipes and boreholes		√	√	2
Transparency between the municipality and the community	√			1

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Team work	√	√		2
Sink new boreholes		√		1
improve monitoring of the situation	√			1
Channel resources to the relevant people	√			1
Reservoir to supply water		√		1
Water reticulation according to the IDP	√		√	2
Connect pipes to the well on the mountain			√	1

Source: Primary data

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4.8 Discussions

There were areas of convergence between the views of the learners and community members who participated in this study. Both the challenges and the suggested solutions were similar. It was interesting to note that women were more pessimistic about the effectiveness of current interventions claiming that nothing was being done to solve the problem. Yet it is the responsibility of the local government to supply water in areas where there is no access to the resource. The Department of Water Affairs and Forestry (DWAF, 2005) states that local government has the responsibility to provide municipal services to all communities within its area of jurisdiction yet the community of Chavani does not receive water regularly from the Makhado Municipality.

The roles and responsibilities of water services authorities towards communities that have not yet served with potable water include identification of unserved communities and their existing water sources and provision of alternative water sources where needed. Water quality monitoring and liaison with the affected communities to propose possible intervention strategies to improve water availability (WHO, 2004). This is further supported by the Water Service Act (No. 108 of 1997) section 5(4) which states that in emergency situations, a water service authority must take reasonable steps to provide basic water supply to any person within its area of jurisdiction and must do so at the cost of the authority (DWAF,2005).

According to the study conducted by Schoch (2007) water delivery was reported to be unreliable at Nsikazi and at times communal taps were closed before people could obtain water. The situation is closely related to Chavani village, members of the community said the time that is used to open and close the communal tap does not accommodate those who go to work. In Gutschwa there is water for 2 to 3 days and the community members only get water from 14 hours in the afternoon to 18

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hours in the evening per day or every second day. Meanwhile in Chavani they get water twice a week and the water is open from 8 hours in the morning to 16 hours in the evening. The water that is collected is stored at home. When water is stored in the containers and the time they use the water while it is stored in plastic containers present the communities with a health risk (Fosso-Kandeu, Jagals and Dupreez, 2008). According to Malzbender, (2005) women and girls in communities collect water for cooking, bathing, cleaning, livestock and growing vegetables. They also ensure that the family is healthy by fetching enough water that will ensure that they maintain health and hygiene. However, households are exposed to water borne diseases. Uzoma (2002) noted that at any time hospitals are occupied by people who suffer from water borne diseases this is as a result of community wells which may be polluted.

On conducting observations different cases were interviewed and their time of collecting water depended on the weather. Most of the people indicated that they collect water in the mornings and evenings to avoid the heat of the day. People stand in queues from as early as six o 'clock in the morning until 12 o'clock in the afternoon. During the weekend, others arrive as early as five o'clock in the morning. Facuis (2008) indicated that in every place where water is collected regardless of the source of water people have to wait in a queue for long hours for their turn to collect water. Children, boys and girls as young as nine years of age collect water from the well. During the observations, a man came with a wheel barrow carrying about four containers as the queue was long he did not stay he left. This is an indication that water affects all the members of the community even if men are involved occasionally.

Furthermore, Makgope (2001) reported that men are occasionally involved in fetching water however to a limited extent. Unmarried men or wives are not available at all times to collect water. Incidentally, most of the children who collect water are still in primary school. On average, the amount of water used by a family of four

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ranges from 75 to 100 litres per day. The present findings are similar to Sekororo village where there is variability in the quantity of water used by the households per day on average the households use between 75 litres of water to 200 litres per day (Kanyoka, 2008). This is supported by Facuis (2008) who reported that households are in need of 120 litres of water to 200 litres per day. Some of the respondents indicated that sometimes they buy water from the water vendors for up to four rands per day adding up to about one hundred rands per month. However, the free basic water policy guarantees each household a free minimum quantity of potable water. The regulation is based on the assumption that each individual person needs 25 litres of water per day (Gowlland – Gualtieri, 2007). There were variations in the time spent when going to fetch water and coming back from the well. Some of the respondents stay far away from the well while others stay nearby. The time ranged between one hour and of two hours thirty minutes. The community members who have connected pipes from the Ribolla Mountain were faced with some challenges.

In the current study, the respondents identified a few challenges among which heavy rainfall was also mentioned. Ziervogel, *et al.*, (2006) stated that floods and drought are the main features of the South African climate. When it rains in summer shallow wells are easily polluted as the water starts flowing carrying contaminants to the wells that supply water to the community. On the other hand, when cattle go and drink water in the river the well becomes polluted. According to Faniran, *et al.*, (2001) rivers, streams and ground water are the main source of water for rural communities in South Africa. However, the quality of water depends of the location and the environment of a particular area. To support these Faniran *et al.*, (2001) further stated that the water from a spring in Isinuka was not suitable for human consumption in its natural state treatment was needed before being utilised for drinking purposes by households. DWAF, (2006) in a guideline for water supply states that underground, water which is less exposed to evaporation, is often of better quality and provides a cyclical surface water supply. The other problems that communities face includes: having to clean the well 3 times per month. This is

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supported by Edgerton (2011) who stated that private wells are monitored by the owners who are also responsible for ensuring that the water is of good quality.

Besides water being polluted and lack of funds for maintenance purposes it was also reported that community members who did not contribute money stole water at night. This finding is in line with what Parry-Jones *et al.*, (2002) who observed that many projects are challenged by community members who are not willing to make contributions for the service that is provided. Thus, Berntell (2008) suggested that women involvement in the planning for water supply in different parts of the world promotes sustainability. Women are the first to realise that there is no water at home; they also know when there is a problem with the cleanliness of water. There are times when one has to go up the mountain alone to fix the pipes when the water is not flowing properly. At times pipes get damaged and need to be fixed Obi *et al.*, (2007) noted that equipment failure was one of the major challenges.

This is further supported by Mzezewa *et al.* (2010) who reported that sustainability requires operational funds to maintain and manage the water system on a regular basis. To overcome this, the community members sell the water that comes from the well for fifty cents to raise funds in case the pipes are damaged. Generally it can be argued that lack of funds to maintain and operate water facilities lies at the heart of these communities which has deemed it important to make an initiative that benefit them. Louw, (2003) stated that community members must be involved in coming up with programmes that can be used in providing monitoring and evaluation of water projects once they are implemented. Furthermore, Strachan, (2004) indicated that community participation is essential but at present the involvement of communities in the running water projects is limited.

To support this statement, Malzbender (2005) conducted a study in Tshikombani in the Vhembe District where communities needed to solve the water supply gap in their village. They contributed money to provide water to the residents by connecting

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pipes to the stream on the mountain. This initiative provided the community with secure water supply. Facuis (2008) states that it is well known that water is a free resource it flows freely in the rivers when it rains yet it is scarce. Furthermore, communities from Sukuma in Tanzania indicated that no one can be denied access to the water resource regardless of source. This is also the same in Chavani with the exception of the well where community members raised funds to connect their own pipes. While there is plenty of water from the mountain there are also many challenges.

The community leaders alluded to the fact that the water situation is bad which is in line with what the learners and villagers noted. However, they raised certain points which were not stated by the community. According to the councillor there were illegal water connections done by the villagers. They also reported that the infrastructure is old and there is lack of monitoring of the infrastructure. Van Niekerk and Dupisan (2006) indicated that water supply infrastructure is generally in a reasonable state but it is deteriorating and local communities do not always have the knowledge, tools and other resources to repair damaged water pumps. According to the IDP (2012) Makhado municipality has insufficient personnel to monitor projects which have been implemented and they are experiencing challenges of leakages and bust plastic tanks. Community members and other stakeholders were of the opinion that a dam should be able to alleviate the problem. Schoch (2007) states that dams are needed by water users and stakeholders in the Crocodile River system. While significant progress has been made in the world to meet the MDG on water goal it is clear that much work has to be done in order to close the gap that exist in the rural areas of Africa (Rosenfeld, 2010). The impact of water shortages at Chavani village was felt by farmers, business people and school goers. According to Fortin (2006) land that was previously used for farming in the area is now used for residential areas.

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4.9 Conclusion

This chapter presented the views of the community, its leadership, male and female learners as well as those of the councillor and the chief. Rich qualitative data derived from interviews, focus group discussions and observations were considered. All the stakeholders mentioned that the water supply situation in the area was 'bad'. For instance, poor maintenance of pipes, erratic deliveries of water by the municipality, community members having to walk long distances to fetch water, was some of the major challenges that were mentioned. To solve the problem, the stakeholders mentioned the construction of more dams as a long term solution, implementation of the reticulation project, renovate the old pipeline and sink more boreholes, and that there is need for the municipality to monitor the situation on the ground more closely. Stakeholders also urged that more resources be channeled towards the community and that there should be transparency between the municipality and the community with information flowing back and forth. Ground water is a source of water for many water scarce rural areas. Wells that were sunk to provide water to communities eventually dried up due to drought. According to Edgerton (2011) when the community continues to extract water from the same well this adds stress on the aquifers which holds water underground. This was the case in the study area where the wells were drying up.

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CHAPTER 5: PRESENTATION OF FINDINGS & DISCUSSIONS

5.1 Introduction

This chapter deals with the presentation of the interpretation and discussion of data arising from the study on the state of the water supply system in Chavani village in Limpopo Province, South Africa. In particular, this chapter is aimed at investigating the contributory factors that have led to the collapse of the water supply infrastructure in the Chavani village in the Nkhensani Tribal Authority of the Limpopo province. Using a combination of qualitative and quantitative designs, the study acquired an understanding of the impact of the shortage of water in the area. The discussion of results in this chapter is based on quantitative data collected using questionnaires.

5. 1.1 The demographic profiles of the participants

The majority (58%) of the respondents who participated in this study were females (see Table 5.1). The age cohort 15-25 dominated by constituting 67% of the respondents. This was followed by the age groups 26-35 and 36-45, each accounting for 10% of the respondents. The age group of over 55 years accounted for 8% of the respondents. In terms of skew, the distribution weighed heavily towards the youth. In terms of highest educational attainment, slightly more than half (53%) of the respondents did not divulge their status. About a quarter (23%) of the respondents had achieved matric education; 15% had a diploma while a few (2%) attained degrees and 5% had postgraduate qualifications. With regard to employment status, a majority of the respondents, (68%) were still studying (see Table 5.1). Among the respondents, only 7% were working; 8% were housewives, 15% were unemployed while 2% were working on a part-time basis.

Majority of the respondents (78%) have stayed in the area for more than 11years. As shown in Table 5.2, 12% of the respondents had lived for less than 1 year. From a different angle about 88% of the respondents have stayed for more than 2 years in the area, which is sufficient time to know the challenges that beset the community.

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Table 5.1: The demographic profiles of participants: Chavani Village (n=60)

Variable	Category	Percentage
Gender distribution	Female	58
	Male	42
Age distribution	15–25	67
	26–35	10
	36–45	10
	46–56	5
	55+	8
Highest education	Did not answer	53
	Matric	23
	Certificate	2
	Diploma	15
	Degree	2
	Post graduate qualification	5
Employment status	Working full-time	7
	Working part-time	2
	Still studying	68
	Housewife	8
	Unemployed	15

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`Table 5.2: Respondents' duration of stay in Chavani area

Duration	Percentage
Less than 1 year	12
2-5	3
6-10	7
11+	78
Total	100

Source: Primary data

5.2 Sources of water for domestic use

A question was posed to the respondents to name where they got their water for domestic use. A third of the respondents (33%) stated that they buy their water from neighbours with boreholes. This speaks to the challenge of water access in the area. Only 16% have a tap at home. Surprisingly, 18 and 12% of the respondents still fetch their water from the spring and river, respectively. Only 7% of the respondents have access to the communal tap. Those who have their own boreholes constitute 13% of the respondents.

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Table 5.3.Sources of water for domestic use

	Percentages
Tap at home	17
Communal tap	7
Spring	18
River	12
Borehole	13
Buy from neighbours with boreholes	33
Total	100

Source: Primary data

5.3 The collection of water from communal tap

5.3.1 Number of days in a week when water is fetched from communal taps

The question, "How many days in a week do you get water from a communal tap?" was asked only to participants who fetch water from the communal taps. Table 5.4below shows that 43% of the respondents fetch water from the communal tap for 1-2 days per week. A sizeable number of respondents (35%) have to visit the communal tap as many as 5 times per week to fetch water.

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Table 5.4 Number of days per week when water is fetched from communal taps

Days	Percentages
N/A	15
1-2 days	43
3-4 days	7
5+	35
Total	100

Source: Primary data

5.3.2 Distance travelled to collect water from the communal tap

Respondents were asked how far they travel to collect water from the communal tap. About 40% estimated that they travelled less than 200 m to fetch water from the communal tap; 25% are within 300 – 400 m to the communal tap and 10% within 500-600 m and 5% have to travel more than 1 km to the communal tap. Distance is also a factor that determines access to water. The longer the distance, the less access one will have to water (see Table 5.5).

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Table 5.5.: Distance travelled to collect water from communal tap

Distance	Percentage
N/A	20
Less than 200 m	40
300-400 m	25
500-600 m	10
More than 1 km	5
Total	100.0

Source: Primary data

5.4 Time of the day when communal tap is opened for the community to fetch water

The pie chart below (Figure 5. 1) reveals that 58% of the respondents reported that the communal tap is opened in the morning. Ten percent said the communal tap is opened in the afternoon and 2%, in the evening. About 30% of the respondents did not answer this question.

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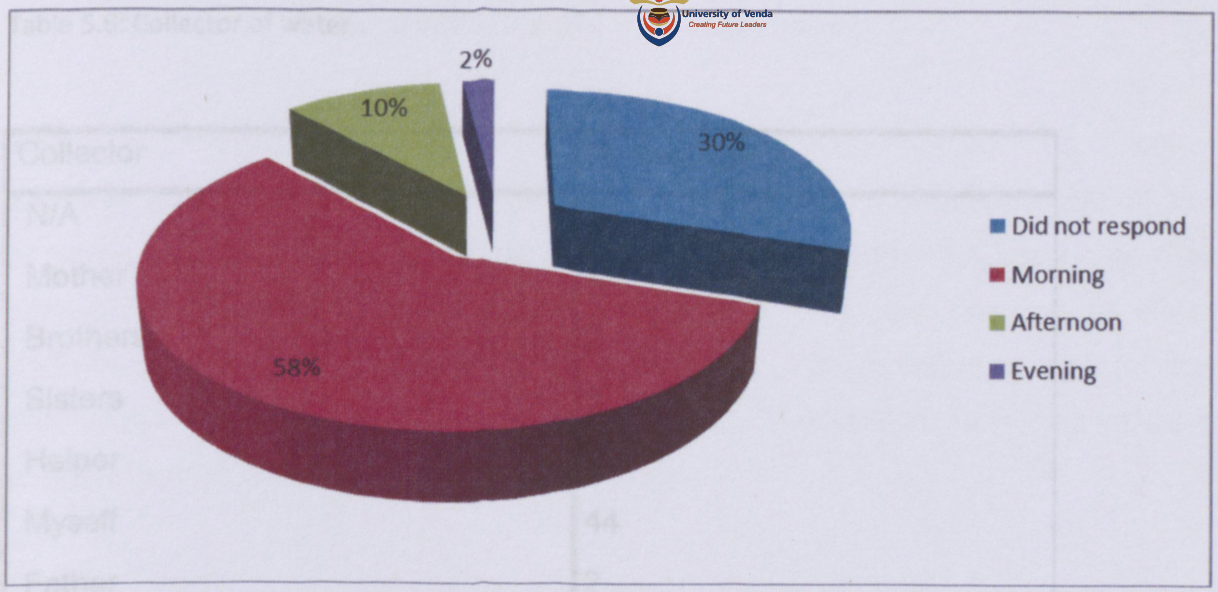

Figure 5.1: time communal tap is opened

Source: Primary data

5.5 Members of the family responsible for collecting water

A question was posed to respondents regarding the person who collects water for the family. Table 5.6 reveals the gendered nature of water collection in the villages of Chavani. Close to a quarter of the respondents (22%) were mothers. Fathers and Boys were only mentioned each by at least one respondent. Forty-four per cent (44%) of the participants in this study fetched water themselves.

The age distribution of those who collected water is shown as Table 5.7 below. The table shows that the age group 15-25 is the one that bears the burden of fetching water with females in the preponderance.

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Table 5.6: Collector of water

Collector	Percentage
N/A	22
Mother	22
Brothers	2
Sisters	3
Helper	5
Myself	44
Father	2
Total	100.0

Source: Primary data

Table 5.7.: Distribution of the collectors of water

		Male (No)	Female (No)
Age distribution	15–25	10	14
	26–35	3	4
	36–45	4	5
	46–56	1	4
	55+	0	1
Total		18	26

Source: Primary data

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5.6 The Cost of 20 litre of water bought from neighbours

The study revealed that 58% of the respondents pay R1.00 per 20 litres of water; 24% pay R3.00 per 20 litres, 13% pays R2.00 and 5% as much as R4.00 per 20 litre of water. The latter case (R4.00 per 20 litre container) informs the issue regarding scarcity of water in the area on the basis of supply and demand or sheer exploitation/greed on the part of the water vendors. Cost, therefore, is a factor that determines who accesses water. For those paying R4.00 per 20 litres, this imposes a heavy burden on them to access a right – water.

5.7 Meeting to discuss the water problem

Participants were asked if they had previously had a meeting to discuss water problems in the community. This helps to appreciate the need and urgency of the matter for the committee. Figure 5.2 depicts that 80% of the respondents have been involved in a meeting to discuss water in their community.

Albeit 80% of the respondents attended meetings, 41% of them believed that the community leaders were responsible for calling meetings to discuss the challenges of water. Thirty per cent ascribe the function to community members; 8% believe the South African National Civic Organisation (SANCO) and only 5% think it is the municipality' s prerogative.

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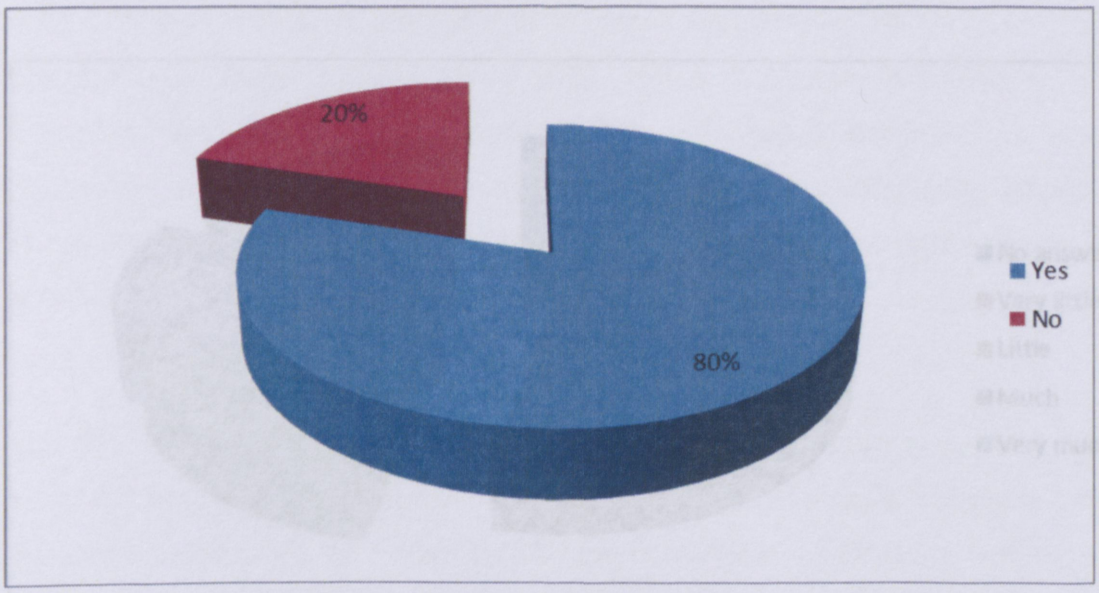

Figure 5.2: Meeting to discuss water problems

Source: Primary data

5.8 Perceptions of community members about the progress made to solve the water problem

Respondents were asked about their perceptions regarding the progress made with respect to solving the water problem. Figure 5.3 below show that 39% of the respondents believe 'very little' progress has been made to solve the water problem in the community; 15% believe 'little' progress has been made. These constitute a combined majority of 53%. Thirteen per cent and 19% believe 'much' and 'very much' progress, respectively has been made regarding resolving the water problem in the village. These make up a third (32%) of the respondents.

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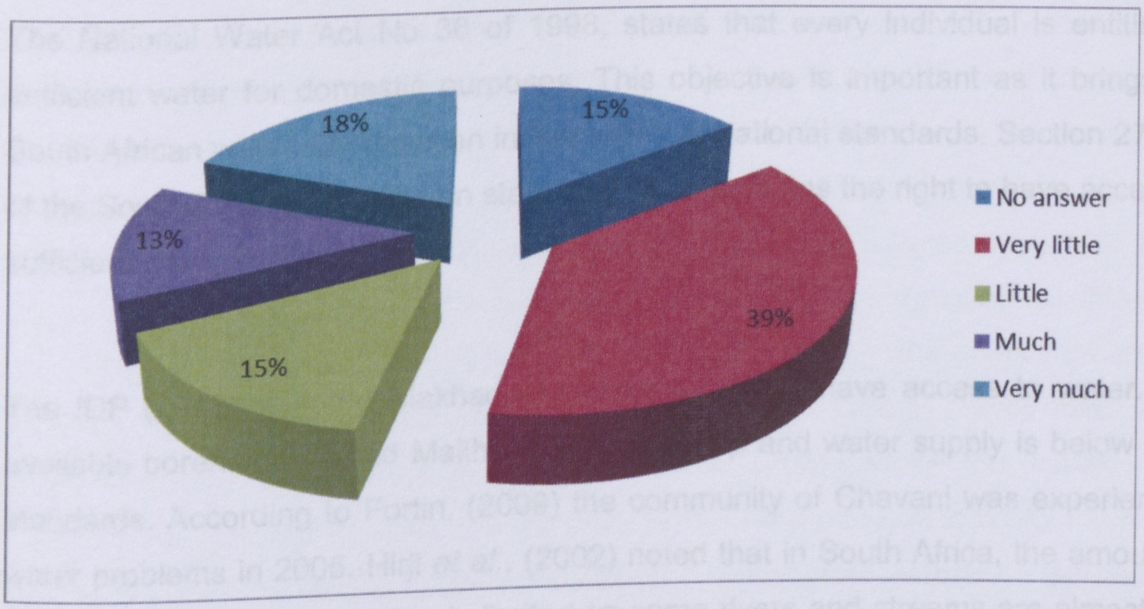

Figure 5.3: Progress made to resolve the water problem

Source: Primary data

5.9 Discussion

There are a variety of water sources in south Africa that provide water to the rural areas each and every source has its challenges and a range of socio-economic impacts on community members such as non – cultivation of land. At Chavani village water is unequally distributed. Certain areas receive water from communal taps while others have to buy water from neighbours who have boreholes. Table 5.3 revealed the different dimensions of where water is collected. Given the progress that has been made in the world to meet the MDG on water, it is clear that much work has to be done in order to close the gap that exists in the rural areas. The findings above are consistent with those of Faniran *et al*. (2001) who indicated that the main sources of water available to rural communities in South Africa are springs, rivers and ground water (Manyanhaire *et al*., 2009). Furthermore, Tapel (2012) indicates that the most important uses of water are for the purposes of cleaning, cooking, laundry and brewing African beer. Chavani village is not excluded from

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such activities. Water is life yet it is a scarce resource in many rural communities. The National Water Act No 36 of 1998, states that every individual is entitled to sufficient water for domestic purposes. This objective is important as it brings the South African water dispensation in line with international standards. Section 27 (1b) of the South African Constitution states that everyone has the right to have access to sufficient water and food.

The IDP (2012) reported Makhado Municipality not to have access to water. The available boreholes around Makhado are drying up and water supply is below RDP standards. According to Fortin, (2009) the community of Chavani was experiencing water problems in 2005. Hirji *et al.*, (2002) noted that in South Africa, the amount of water for human consumption is limited as some rivers and streams are almost dry. The same author also reported that water was a vulnerable resource due to climate change. There is an increase in the demand for underground water. Households and other sectors in the country have resorted to sinking boreholes to access it.

This has had a negative impact on ground water as people are pumping more than what the aquifers can provide. All these factors result in lowering of the water table. This is supported by Madzwamuse (2010) who reported climate change as one of the challenges facing the world. Climate change results in an increase in temperature and changes in rainfall patterns, changes that are expected to affect agricultural productivity in the near future. South Africa is not excluded from the impact that climate will have on the agricultural sector. It is estimated that in 50 years' time South Africa will experience high temperatures, there will be a decline in precipitation of between 5 and 10% which will be accompanied by drought. The reliability of water supply is dependent on the amount of rainfall the country receives during the rainy season (Birongo and Quyen Le, 2004).

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Climate change has a negative impact on the economy of the country. With a decrease in agricultural production, the Gross Domestic Product of the country will decline as the contribution from the primary sector will be low. The decline in the amount of rainfall increases the distance travelled to fetch water in the rural areas. According to Manyahaire *et al.,* (2009) gathering water requires much time and effort, in Zimbabwe in the district of Makonde the distance covered by women is 1.4 km in the wet season and 2 km in the dry season. Table 5.5 above indicated that 40% of water collector travelled less that 200 m meanwhile there were those who travel for more than 200 m only 5 % travelled more than 1 km to collect water this is nearly similar to the findings by Mokgope, et al., (2001) where the distance to a water source is less than 250 m, less than 10 % of the population walks more than 1km to a source of water. Furthermore when a water pump is broken women and children are affected when they have to travel long distances to collect water, the time spent collecting water increases during the dry season (Naidoo, 2008).

The findings above clearly indicate that women and children are responsible for providing water in the households. However in the study done by Mokgope et al., (2001) 90% of water collectors were women. In both studies it is primarily women who collect water. Table 5.6 and 5.7 results are in line with Facius (2008) study which was conducted in Mawindi and Isunura villages of Tanzania where women were leading the way when it comes to water collection. Nandita *et al*., (2003) argue that it is important to link women to water in more than one way. Firstly, as beneficiary of water projects and secondly, as it has been their responsibility to manage water. They are the first to participate at community level because they possess the major interest in the local water availability (Nandita *et al*., 2003). Women play a major role in the provision of water to the households and are responsible for the effective management of water. In Chavani village, women and children take a leading role in the fetching of water from the different available sources. They have to wake up in the morning and fetch water to avoid the heat of the day. These impacts negatively on the learners progress at school.

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Although the participation of youth both male and female differ slightly female youth are still at the forefront together with women (Mayanja, 2006). In the current study, few men were involved in the collection of water. Although only a few men were involved in water collection, this is an indication that water shortages affect everyone in the community regardless of gender. The study conducted in Ghana is in line with the findings in Chavani in that women and children were the main collectors, users and managers of water in the households (Mayanja, 2006).

Water has always been a precious resource, whose demand increases with increase in population (Glass, 2010). According to the WHO, UNICEF access to an improved water source is the ability to obtain at least 20 litres of water per person per day as approved that is within 1 km from the household. According to Leigh (2012) selling water is a political and emotional issue. Rural areas which experience water scarcity like Chavani have seen private households who have boreholes engaging in selling water as a basic need. In Chavani where community members use between 40 litres and 160 litres per day depending on the size of the household such a household has to include water in their monthly budget. Communities who cannot afford have no choice but to collect water from unprotected wells. Gehrig, *et al.,* (2009) state that the amount of water used per day for washing and other household needs is between 50 and 200 litres per day. This is in line with what has been mentioned above. Van Niekerk and Du Pisani (2006) state that the South African government expects community members to pay for the water service in line with the policy for water users.

Water prices should be affordable while the government should be able to recover the costs of providing the service and ensure that there is sustainability in the provision of water (Leigh, 2012). Craswell, (2006) argues that rural areas are faced with problems which are not encountered in urban areas. It is expensive to supply rural households with water as they live in dispersed settlements. People who live in rural areas are either unemployed or if they are working, their income is low which

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makes it difficult to fund and maintain water projects which are made available to them. Although women and children are responsible for collecting water those who are water vendors are man (Kjellen and Granahan, 2006).

This is an indication that water as a scarce resource needs every member of the community to be involved in water-related matters for sustainability in its provision. It is clear that water is a huge concern to the community leaders and members and to the municipality going by these data. The DWAF state that community consultation, involvement and awareness can have an effect on the confidence of communities. From the current finding it is clear that community members are aware of the meetings which are called to discuss water problems in the community (see Figure 5. 3 and 5.4). However, very little progress has been made to resolve the problem. When there is lack of communication among community members a barrier is created between the community and the leadership (Ziervogel, 2006). According to the study done in Sekhukhune district there was a lack of communication which created problems as the channels of communication were not followed. In Chavani the situation is different as meetings are called but there is no progress.

Different studies have stated that community involvement in all aspects of water resource management has been one of the pillars of success in many regions of South Africa (Hinji, 2002). Therefore, it is imperative to involve the community in all aspects of water availability as well as the sustainability of water projects. In the current study it was indicated that community leaders are responsible for calling the meetings. This is supported by a study done by Sichone, Mabiza and Nyambe (2007) who indicated that traditional leaders are concerned with water management and the Chief is at the forefront. In the case of Chavani leaders indicated that there was progress in solving the problem as there were people who had been tasked by the municipality to do feasibility studies in the village to come up with solutions. However, communities are in the dark with regards to the progress made.

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South Africa is facing a water crisis with climate change, droughts and floods and high temperatures having an effect on its availability for potable use in the households (CSIR, 2010). Current findings reflect that that water is opened in the morning which does not accommodate those who have to go to work. The findings related to the number of days the water tap is opened is similar to the findings in the study conducted in the village of Matlou in Limpopo province, the similarities are that in both villages communal taps are opened twice a week. However the study differs from that of Chavani (figure 5.1) in that water is opened in the afternoon only meanwhile in Chavani the taps are opened from 8:00 in the morning to 16:00 in the afternoon. In the area of study the reason for opening water in the morning could be the fact that water collectors are of school going age they can be able to collect water in the morning and afternoon. It is just unfortunate that those who go to work are not accommodated. Taolome village however, only receives water once a week (Makgoka, 2005) and the water that is collected is kept in 20 or 25 litre plastic containers. While the water is kept in containers before it is used its quality deteriorates which might lead to water borne diseases. According to the drinking water quality of South Africa the policy states that all water supplied should be clean and drinkable.

5.10 Conclusion

Although much has been done in the country to address water scarcity the community of Chavani village is still collecting water for domestic use from a variety of untreated sources such as wells and rivers. The community is also spending a lot of time collecting water and money on purchasing water. Women and children especially leaners are involved in water collection. An investigation on the water quality from various types of wells could assist in alleviating water shortages as well as coming up with strategies for improving water quality. Furthermore this will reduce the time spend collecting water from rivers, wells and reduce the amount of money

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spent on purchasing water. Time could be spent productively doing activities such as household chores, homework's and studying for learners.

The municipality together with the community should come together and discuss the water situation in the area. Furthermore the Chavani community has a good opportunity of improving its water situation as they are able to hold meetings to discuss their problems. However it will be advisable that members of the municipalities and other relevant stakeholders such as business men and women and those who are engaged in farming are invited to such meetings. In addition, follow up meetings should be done to check on the progress. Establishing a committee that could provide feedback to the community and all the stakeholders should be put in place. Efforts should be made by all relevant stakeholders to ensure that community members have access to water in an equitable manner to enhance community cohesion.

CHAPTER 6: GENERAL DISCUSSION, CONCLUSIONS & RECOMMENDATIONS

6.1 Introduction

The objective of the current study was to investigate the water supply system in Chavani village under the Nkhensani Tribal Authority. Water crises continue to increase as a result of the growing population (Rosegrant *et al.*, 2009). Although water is a renewable resource, it is a scarce resource in Chavani village hence it needs to be conserved and managed well to ensure sustainability. According to DWAF (2006) communities do not have reliable sources of water. Limpopo Province is a water scarce province. Both surface water and underground water play a major role in supplying water to the community. Water scarcity and shortages put a lot of strain on communities. In this chapter, a general discussion of the study findings is presented followed by conclusions and recommendations.

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6.2 General discussion

The first objective of this study was based on the establishment of the water supply situation and challenges in the Nkhensani Tribal Authority. The study findings show clearly that although a lot of work has been done in an effort to achieve the Millennium Development Goal (MDG) of water supply in the country, much more needs to be done to improve the situation in the rural areas. According to the MDG Summit Report (2010), rural areas across the world remain disadvantaged. Despite overall progress, eight out of ten people are still without improved water source.

In the current study, the communities fetch water from untreated springs and rivers and this poses health threats. The quality of water that is used by the community of Chavani is not known. It is essential that the water should be tested to determine its quality. Not all communities receive good quality water in the country yet adequate supply of good quality water is critical to support human health. According to DWAF (2005) access to safe drinking water is a basic human right and is essential to people's health. Water quality management is one of the challenges facing developed and developing countries. Chavani is not excluded from such challenges. It was also found that in order to avoid water borne diseases, there is need to educate the community about water treatment. Education is essential to improve water quality risks (Ademun, 2009).

Chavani village lagged behind in terms of water supply from the government because communal taps were present in certain areas and absent in others. A reflection of limited water access is that some community members have to buy water from neighbours owning boreholes. Access to water is a basic human right yet the Chavani community is still served at a standard below the RDP standard. According to the policy of Free Basic Water (FBW), the municipality has to ensure that no one is completely denied access to water supply as a result of their inability to pay for the service (VDM, 2012). Our municipalities are responsible for reticulation

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of water at municipality level. However, the municipality cannot address the backlog of water.

A sizeable number of respondents fetched their water from communal taps which were opened twice a week. These are an indication that households are not receiving the minimum amount of water of 20 litres per person day. From an approved source that is within 1 kilometer from the household (WHO, UNECEF, 2012). Meanwhile other villagers have gone an extra mile in trying to ensure that there is water in the village by connecting water from the mountain.

Villagers in Chavani complained that buying water was counter-productive as the money could easily have been deployed elsewhere. Water scarcity in Chavani has a negative impact as community members do not have enough time and energy to engage in economic activities (Sigenu, 2006). The learners' main concern was that they had to collect water after school. Wells are not protected which means that the quality of water undermines the human right of people to have water that is not harmful to their health. Women were at the forefront of ensuring that the well is clean and providing water to their households.

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The second objective of this study was based on the assessment of community's perception on solving the water problem. The respondents believe 'very little' progress has been made to solve the water problem. It was revealed that there were many challenges in the community that needed to be addressed to overcome the water problem in Chavani. The participants were more concerned about the deteriorating infrastructure including boreholes and pipes. The problem that is experienced in Chavani with regard to deteriorating infrastructure is one of the challenges faced by many rural communities. Alabaster (2011) indicated that one of the future challenges related to water supply is increased risk for leakages and deteriorating infrastructure.

The respondents were of the view that new boreholes must be installed and old ones fixed. Repairs have to be made to damaged water pipes, and there is the need to connect new pipes to old ones to increase access. It is important to have continuous monitoring of the infrastructure to ensure that it is functioning as effectively as possible. According to the study done by the CSIR (2007) there increase in the deterioration of infrastructure together with unacceptable quality of services in the municipalities of South Africa.

The respondents in the study felt that the municipality must also play a role by supplying water. Municipalities are responsible for water reticulation and provision of services to all community members under its jurisdiction. The responsiveness of participants in the study indicated that the community knows what could work for them. Furthermore, they felt that teamwork between the community and all relevant stakeholders could help to work towards a common goal.

The third objective assessed the effectiveness of the existing interventions to solve the problem. The findings of this study show clearly that more work can still be done in an effort to ensure that Chavani village water supply is sustainable. Community members are of the view that there is little to nothing that is happening to solve the

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water problem. It was revealed that the government's decisions are not working because some get water and others do not. Taps are stolen in streets. To circumvent this; those who can afford are trying to buy their own taps. The study also highlighted that interventions were generally not effective and people still have insufficient water. Stakeholders painted a dull picture of the situation in their area. Stakeholders need to work hand in hand with the municipalities for a common goal of water provisioning in the community. For development to take place community participation should be prioritised (Ademun, 2009).

The fourth objective was based on the recommendations and possible sustainable arrangements to solve the problem. In this study respondents emphasized the need for the sinking of more boreholes for the benefit of current and future generations and to ensure availability of clean water in the long term; fixing pipes as well as changing the water committee in pursuit of a sustainable solution to the water crisis; connecting water pipes from the wells on the mountain to the reservoir for reticulation to houses and also the provision of taps on the streets.

6.3 General Conclusion

This study noted the multiplicity of challenges facing the village. This then justifies unpacking of the gender dimension regarding water availability in the area. Women were at the forefront of cleaning the wells, repairing pipes and fetching the water. The involvement of women in the initiation and implementation of projects is paramount given the roles that they have been playing as exemplified and demonstrated in this study. Women came out as astute and smart users and preservers of water. The exploration of alternative methods of water conservation and the use of other technologies such as wind pumps must also be considered as suggested in this study. These methods could help in alleviating the burden of fetching water from the learners and children. Whose education took a back sit as they had to ensure that their respective families had water before attending to their school work.

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The problems had been affecting both adults and the youth with respect to the possibility of engaging in agriculture and other productive chores and their studies, respectively. Well users should be educated on proper handling and storage of drinking water. The water should be checked regularly for contamination and appropriate treatment be implemented to assist the community.

It is important to prioritise what the community has identified as challenges in their village in order to come up with the solution to the water problem as stated above. There is need to renew water pipes and boreholes in Chavani village. Upgrading the infrastructure and sourcing out funds to assist the community to address the quality of water that they drink from the well are important aspects worth pursuing in the broader scheme of things.

6.4 General Recommendations

In general, rural communities must be educated on how to store water. Community involvement will help in achieving the common goal of water provisioning in the village. All leaders in the community should work together as a team to achieve a common goal.

Current intervention measures were found wanting. Given that the community feels that very little headway has been made regarding the water situation, there is need to call a stakeholder meeting involving those with an interest in the resolution of the water crises in the area. Of importance would be community leaders, community members, municipality and the NGOs. The meeting would assess the severity of the problem and flag out the challenges in order to assess the community's capabilities in solving the problem and pool resources together.

Concerted effort should be made by all relevant stakeholders to ensure that community members have access to water in an equitable manner to enhance community cohesion. Guarding the water infrastructure should also be prioritised. It

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is recommended that the current old water infrastructure must be repaired and more boreholes must be sunk so that every street can have a communal tap. This will improve water accessibility to the community in terms of cost and distance. This has a knock on effect on the community's wellbeing in that their sanitation will improve while opening possibilities for them to engage in agriculture on a sustained basis. Learners could get more time to concentrate on their studies rather than spend a lot of their time fetching water.

Civic campaigns to educate communities on water harvesting and its conservation should be made. There will be need to train people on the technical aspects of maintenance of water infrastructure involving community members, Government, NGOs, entrepreneurs and other relevant stakeholders.

6.5 Recommendations for further research

The areas of future research should focus on:

- The gender dimensions of water usage for domestic use (time spent fetching water and associated opportunity costs), its preservation, harvesting and use in sustainable agriculture.
- Extensive Investigating on the quality of water from Ribolla Mountain and other wells around Chavani have to be determined.
- A comparative study of water challenges faced by villages under the Nkhensani Tribal Authority.

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7. REFERENCES

Abrams, L. 2009. Water scarcity. www.africanwater.org/drought water scarcity.htm (accessed 13 December 2012).

Ademun, S.R. 2009. Domestic water supply: An Evaluation of the impacts. Challenges and prospects on women in rural Households in Uganda. Msc. Thesis. Lumes, Lund University, Uganda.

Agnew, C. and Anderson, E. 1992. *Water resources in the Arid Realm*. Routledge London and New York:

Alabaster, R. O. 2011. Overview of future challenges related to water supply and sanitation in urban areas. Independent consultant water, sanitation & environment. Stockholm.

Ashton, P. and Haasbroek, B. 2002. Water demand, management and social adaptive capacity. A South African case study In: Turton A and Henwood R ed. Hydro politics in the developing world: A South African perspective. Pp.185-192

Babbie, E. and Mouton, J. 2001.*The practice of social research*. Cape Town: Oxford University press.

Babbie, E. 2005. *The basics of social research*. New York: Chapman University.

Barrow, C.J. 2006. *Environmental management for sustainable development*. 2nd ed London and New York: Routledge

© University of Venda

Benhin, J.K.A. 2006. Climate change and South African agriculture: Impacts and adaptation options. CEEPA. Sea waste. UWC.za/archive/environ. WATER IWRMPL.doc. (accessed 2010 May 05)

Berntell, A. 2008. Water front. A forum for global water issues (3-4).In: Blenckner, S, S, and Peak water – Era of Sharpening Water Shortages. December 2008, published by Stockholm international water institute (SIWI), Sweden. www.siwi.org (accessed 22 November 2011) pp. 4 –14.

Bigas, H. 2012. The Global water crisis: Addressing an urgent security Issue. *Paper for the international council 2011 – 2012*. Hamilton, Canada: UNU – INWEH, pp. 10 – 58.

Birongo, J.M. and Quyen Le, N. 2004. Analysis of water governance in Kibera, Kenya. Roskilde University centre international Master of Science in environmental policy and the global challenges 2004/2005\, pp. 20 -60.

Bless, C. and Smith, C.H. 2000. *Social research methods: An African perspective*. (3rd edition) Cape Town: Juta Education.

Council for Scientific and Industrial Research, (CSIR) 2007. The state of municipal infrastructure in South Africa and its operation and maintenance: An overview. Towards a framework for the maintenance of municipal infrastructure in support of government growth objectives. pp. 4-16.

Council for Scientific and Industrial Research (CSIR) 2010. A CSIR perspective on water in South Africa. - 2010CSIRNReport No. CSIR/NRE/PW/IR/2011/0012/A. www.csir.co.za (accessed 14 November 2012) pp. 15-50

Craswell, E.T. 2006. Water and poverty in South East Asia*:* The research agenda from a global perspective*. Proceeding of the SEARCA Regional conference on water Governance and poverty,* 9 – 10 March 2005, *Manila,* pp.1–10.

© University of Venda

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Creating Future Leaders

Dasouqi, D. 2010. Water scarcity and actor's involvement. The case of the European Union – member state Spain. Bachelor theses school of management and Governance. University of Twete, European Union, Spain. essay. Utwente inl/603201/1Bsc_D_Dasouqi.pdf (accessed 20 October2012) pp. 11-37.

Department of Water Affairs and Forestry (DWAF) 2005. A Drinking water Quality Framework for South Africa. htt://www.dwaf.gov.za. (accessed 03 February 2011) pp. 10–59.

Department of Water Affairs and Forestry 2006. Republic of South Africa Limpopo water strategy and five-year Provincial water sector plan. pp. 2–36.

Department of Water Affairs and Forestry (DWAF). 1997. White paper on a National water policy for South Africa. Pretoria.

Department of Water Affairs and Forestry (DWAF). 1998. National Water Act No 36 of 1998, South Africa.

Department of Water Affairs and Forestry (DWAF). 2002. National Water Resource Strategy. Proposed first edition, summary, August, pp. 37.

Department of Water Affairs and Forestry (DWAF). 2004. Directorate National water resource planning. Internal strategic perspective. Limpopo water management area. Version1, http://www.dwaf.gov.za/documents/ (accessed 24 November 2011)

Department of Water Affairs and Forestry (DWAF). 2004. Internal strategic perspective: Limpopo water management Area.www.dwaf.gov.za/…/LIMPOPO REPORT.pdf. (accessed 11 September 2011)

Department of Water Affairs and Forestry (DWAF) 2005. A drinking water quality framework for South Africa. http://www.dwaf.gov.za (accessed 13 October 2012).

© University of Venda

Department of Water Affairs and Forestry (DWAF). 2006. Guidelines for water supply systems operation and management plans during normal and drought conditions.

Department of Water Affairs and Forestry (DWAF). 2006. Republic of South Africa Limpopo water strategy and 5 year Pro*vincial water sector plan*. (2007 – 2012) pp.2 – 36

Department of Water Affairs and Forestry (DWAF). 2007. Directorate: Policy and strategy Free Basic Water Implementation Strategy. Consolidation and Maintaining version 4.www.info.gov.za/view/Download file Action-? id = 13123/. pp.9 - 29

De Vos, A.S., Strydom, A. and Foucher, C.B. 2002. Research at grass roots for the social sciences and human services professions. Pretoria: Van schaik publisher. pp. 286-299

Donkor, S.M.K. 2003. Development challenges of water resource management in Africa. *African Journal* 1–10.

Du Preez, M., Le Roux, X. W., Potgieter, N. and Venter, S.N. 2008. The genetic relatedness of E. coli associated with post collection drinking water contamination in rural households. *Water South Africa***34** (1):107 – 111

Edgerton, D. 2011. Minnesota water sustainability framework: Domestic use Technical work team report.

Facius, J.L. 2008. Water scarcity in Tanzania – conflict or cooperation? An analysis of the relationship between institutions and local water conflict and cooperation.

Faniran, J.A., Ngceba, F.S., Bhat, R.S. and Oche, C.Y. 2001. An assessment of the water quality of the Isinuka springs in the Transkei region of the Eastern Cape, South Africa. *Journal of Water South Africa* **27 (2)**: 241 – 250.

© University of Venda

Fortin, E. 2006. Emerging discourses in policy – making, tenure reform in the former Bantustans' of South Africa. *Institute of development studies.*www.mpl.ird.fr/colloque_foncier/communications/pdf/fortin.pdf (accessed 13 July 2012) pp. 7-24.

Fosso – Kandeu, E., Jagals, P. and Dupreez, H. 2008. Exposure of rural households to toxic cyanobacteria in container stored water. *Water and health research Unit University of Johannesburg*, Water South Africa.34 (5):631 -635

Fox, W. and Mey, I. 1995. *Public Administration Dictionary*. Cape Town: Juta.

Gabru, N. 2005. Some comments on water rights in South Africa. www.puk.ac.za/...2005volume8no1/2005xix Gabruart.pdf (accessed 20 September 2012)pp. 11-33.

Glass, N. 2010. The water crisis in Yemen causes, consequences and solutions. Global majority.**1**(1): 17-30.

Gasteyer, S. 2009. Water conflict resources management and resolution: Trust, Tools, Technology and Politics. Department of Sociology, Michigan State University. pp. 1-7.

Gehrig, J. and Rogers, M.M. 2009. Water and conflict in corporating peace building into water development. Catholic relief services. *Proceedings of the United States conference of Catholic Bishops*. www.crsprogram.quality.org. (accessed 02 May 2012) pp. 3-24.

Global water partnership. 2004. Integrated water resources management.

Gomez, L. 2000. Participations approach are important as they help build. Discussion paper No. 21. Centre for environmental economics and policy in Africa University of Pretoria. seawaste. uwc.za/archive/Environ. WATER IWRMPI.doc. (accessed 15 June 2010).

© University of Venda

Gowlland-Gualtieri, A. 2007. South Africa's water law and policy framework. Implications for the right to water. International Environmental Law Resource Centre. Swiss National Foundation. IELRC working paper.http://www.ielrc.org/content/w00703.pdf. (accessed 14 December 2012).

Haigh, E.H., Fox, H.E. and Coleman, D. 2010. Frame work for local Government to implement integrated water resource management linked to water service delivery. *Journal of Water South Africa***36** (4):475-485.

Hartfield, J.I., and Prueger, J.T. and Svotwa, E. 2004. Impact of changing precipitation patterns on water quality. *Journal of Soil and Water Conservation***59** (1 - 6): 51-58.

Hassan, R. and Crafford, J. 2006. Environmental and Economic Accounts for water in South Africa. 114-168

Hemson, D. 2004. Beating the backlog: Meeting targets and providing free basic services.

Hirji, R., Johnson, P., Macro, P. and Chiuta, T. M. 2002. Environmental sustainability in water resources management in South Africa. SADC Technical Report to inform and guide water resources policy and investments. Cambridge University press. pp. 6-10.

Hirji, R., Johnson, P., Macro, P. and M. Chiuta, T. M. 2005. Defining and Mainstreaming Environmental Sustainability in Water Resources Management in South Africa. Cambridge University press. pp. 312-447.

Jacobsen, M., Webster, M. and Vairavamoorty, K. 2012. The future of water in African cities: Why waste water? Water Partner Programme. Washington DC.

© University of Venda

Kameri – Mbote, P. 2005. Achieving the millennium development goals in the dry lands. Gender considerations. International Environmental law Research Centre, IELRC Working papers 2005 – 8, Switzerland.pp. http://www.ielrc.org/w0508.pdf. (accessed 13 December 2012) pp. 9-15.

Kanyoka, P. 2008.Water value and demand for multiple uses in the rural areas of South Africa: The case of Ga Sekororo.

Kimani – Murage, E. W. and Ngindu, A. M. 2007. Quality of water the slum Dwellers use: The case of a Kenyan Slum African Population and Health Research Centre Nairobi Kenya.

King, N. Letsoalo, A. Rapholo, B. 2003. Developing Markets for watershed protection services and improved livelihoods in South Africa. Diagnosis for South Africa, Draft 1. Report Number: ENV – P – C 2003 – 059 Pretoria. pp. 12-24.

King, C., Ramkisoon, J., Clusener – Godt, M. and Adeel, Z. 2007. Water and ecosystems. Managing water diverse ecosystems to ensure human well – being. United Nations University.

Kjellen, M. and Mc Granahan, G.2006. Informal water vendors and urban poor. Human settlement Discussion paper series theme: water – 3.United Kingdom, London. International Institute for Environment and Development (IIED) www.iied.org. (accessed 27 November 2011). pp. 9–24.

Ladki, M., Seshoka, J., Faysse, N., Levite, H. and Van Koppen, B. 2004. Possible impacts of the Transformation of water infrastructure on productive water uses. The case of the Seokodibeng village in South Africa. Working paper 74. Colombo, Sri Lanka.pp. 3-20.

© University of Venda

Leary, N., Adejuwon. B. Barros, V., Caffera, S., Chinvanno, S., Conde, C., De Comarmond, A., Desherbinin, A., Downing, T., Eakin, H., Nyong, A., Opondo, M., Wehbe, B., Yin, Y. And Ziervogel, G. 2006. For whom the Bell Tolls: Vulnerabilities in a changing climate. A synthesis from the AIACC project. Working paper No.21 Washington D.C.www.aiacc project.org (accessed 12 August 2011) pp. 5 – 25.

Lehloesa, L.J. and Muyima, N. 2009.Evaluation of the impact of household treatment procedures on the quality of ground water supplies in the rural community of the Victoria district, Eastern Cape. *Journal of Environmental management,* **90**. 144 -152

Leigh, J. 2012. Water tight: Top issues in global water. Deloitte Touché Tohmatsu Limited.www.deloitte.com/assets/Dcom.../PA- es-water tight 04m2012.pdf (accessed 24 May 2012) pp. 2-16.

Leigland, J. 2007. The rise and fall of Brown field concessions but some signs of recovery after a decade of decline. 2nd report for Imawesa policy Limpopo Provincial government. Republic of South Africa. Growth and development strategy. 2004 - 2014. Development is about people.

Louw, S. 2003. The ministry of dry taps? The Department of Water Affairs and Forestry and transition to market-based service provision in South Africa. *Politeia* (22):pp. 93-118.

Madzamuse, M. 2010. Climate change vulnerabily and adaptation preparedness in South Africa.Heinrich Boll Stiftung Cape town South Africa: http://www.boell.org.za (accessed 21 November 2012) pp. 6-20.

Manghezi, A. 2003. Out of Bounds: Land Appropriation and Resistance. *Proceedings of the conference on Imperial culture.*

Makhado Municipality Annual Report. 2007.Makhado Local Municipality (NP344) Vhembe District (DC34) Limpopo Province.mfma.treasury.gov.za/Annual Report/... (accessed 24 November 2012).

© University of Venda

Makhado Municipality Integrated Development Plan review. 2009/10 IDP review Adopted document 2010. www.makhado.gov.za/docs/...2009%20-%20IDP.pdf (accessed 15 February 2012).

Makgoka, S. J. 2005. Comparison of water quality between sources and between selected villages in the Waterberg District of Limpopo Province, South Africa: with special reference to chemical and microbial quality. Masters of Public Health, Department of health and social development, University of Limpopo (Turf loop Campus). Polokwane, South Africa. pp. 20-54.

Malzbender, D., Goldin, J., Turton, A. and Earle, A. 2005. Traditional water governance and South Africa's National water Act"- Tension or cooperation? International workshop on África n water Laws: Plural Legislative frameworks for rural water management in Africa'. January 2005, Gauteng, South Africa. 26-28.

Manyanhaire, I.O., Matewa, J.T., Svotwa, E. and Munhuwa, E. 2009. Water shortage related problems following the closure of Mhangura copper mine in Mashonaland West Province of Zimbabwe. *Journal of Sustainable Development in Africa.***11** (4): 239 -259.

Mayanja, R. 2006. Gender, water and sanitation. Case Study on Best Practices.

United Nations: New York. 10-38

Marisol, E., Blauert, J., Gaventa, J., Gousalves, I., Guijt, I., Johnson. and Ricaford, R. 2000. Learning from change issues and experiences in participatory monitoring and evaluation participation in development series. Canada, Intermediate technology publications Ltd.

© University of Venda

Mckenzie, R. S. and Wegelin, W. 2008. Challenges with the implementation of water demand management initiatives in Gauteng Province. Ronniemewrp.co.za pp. 1-14.

Mehta, L. 2005. Unpacking rights and wrongs: Do human rights make a difference? The case of water rights in India and South Africa. IDC working paper 260 Institute of Development Studies.

Meinzen-Dick, R.S. and Rosegrant, M.W.2001. Overcoming water scarcity quality constraints. International food policy Research Institute. A 2020 vision for food, Agriculture and the environment. Focus 9. Brief 1 of 14. October 2001 http://www.waternetonline.ihe.nl/challengeprogram/AR14%20services%20Olifants.pdf. (accessed 26 November 2010).

Merz, J., Gopal, N. and Weingartner, R. 2003. Potential solutions to water scarcity in the rural watersheds of Nepal's Middle Mountains. http://www.bioone.org/doi/full/10.1659/0276-4741%282003%5B0014%AP (accessed 2009 May 10).

M'Marete, C. K. 2003 Climate and water resources in the Limpopo province. Department of Agricultural and Rural Engineering.

Mokgope, K. and Butterworth, J.A. 2001. Rural water supply and productive uses: a rapid survey in the sand river catchment. Association for Water and Rural Development, Acornhoek, South Africa. Institute, University of Greenwich UK. pp. 7-21.

Morais, D.C. and Almeida, A.T. 2010. Water network rehabilitation. A group decision – making approach. *Journal of Water South Africa,* **36**(4):487 – 493.

Mouton, J.1998.A practical guide to programme evaluation: A case study of the

Thousand schools project evaluation. Independent Development Trust.

© University of Venda

Muller, M. 2002. The National water and sanitation programme in South Africa: Turning the right to water to reality. *African Region*. 1-7.

Mzezewa, J. Misi, T. and Van Rensburg, L. 2010.Characteristics of rainfall at semi – arid ecotope in the Limpopo province and its implication for sustainable crop production. *Journal of Water South Africa***36** (1): 19 – 25.

Naidoo, M. 2008. A situational analysis on the public participation processes in integrated water resources management in the Kat River valley. Msc. Thesis, Rhodes University, Graham's Town, South Africa. (accessed 07 July 2012).

Nandita, S., Prosun, B., Gunnar, J. and Gustafsson, J.2003. Department of land and water resources engineering. Sweden: Stockholm Royal Institute of Technology.

Nealer, E.J. 2009. Municipal Governance and environmental crises threats and thoughts. *The Journal for Transdisciplinary Research in Southern Africa,* **5** (1): 73-8.

Nieuwoudt, W.L. 2000. Water market institutions in Colorado with possible lessons for South Africa. *Journal of Water South Africa,* **26** (1-4): 29.

Obi, C.L., Momba, M.N.B., Samie, A., Igumbor, J.O., Green, E. and Musie, E. 2007. Microbiological, physico-chemical and management parameters impinging on the efficiency of small water treatment plants in the Limpopo and Mpumalanga Provinces of South Africa. *Journal on Water South Africa,* **33** (2): 229 -236.

© University of Venda

Pedro, A., Garzon, D. and Strosser, P. 2012. Water Scarcity and Droughts Policy in the EU – Gap Analysis. *Proceedings of the 3rd European water conference*, 24 – 25 May 2012. pp.16 – 32.

Parry-Jones, S., Reed, R. and Skimer B.H. 2002. Sustainable hand pump project in Africa. A literature review produced under a Knowledge and Research (KAR) project funded by the department for international department for international development (DFID). United Kingdom contact No.R7817. http://www.lboro.ac.uk/department/cv/wedc /projects/shp/index/htm. (accessed 2009 June 06).

Peason, A. L., Roberts, M. C., Osoge. O., Ivanova, I., Mayer J.D. and Mescheke, J.S. 2008. Utility of Ec 3m tm Petri film tm and sanitary surveys for source water assessment in Nyabushozi country South – west Uganda. Journal submitted to the department of Geography and global Health University of Washington USA. p. 279.

Pitman, W. V. 2011. Overview of water resource assessment in South Africa: Current state and future challenges. *Water South Africa* **37** (5).

Razwedane, S.S., Shivambu, M.M. and Tshwenang, N.A. 2010. Vhembe district official newsletter.

Rosegrants, M.W. Cai, X. and Cline, S.A. 2003. Will the world run dry? Global water and food security. *Journal on Environment where science and policy meet* **45**(7): http//www.iss.ni/lay out /set/print/ (accessed 20 May 2010).

Rosegrant, M.W., Ringler, C. and Zhu, T.2009. Water for Agriculture: Maintaining Food Security under Growing Scarcity. Environment and production technology division. International Food Policy research Institute, Washington, District of Columbia: environ.annualreviews.org (accessed 10 June 2011) pp. 205-220.

© University of Venda

Rosenfeld, J.A. 2010. Incremental Improvements to community water supply systems through community Health Clubs in the UMzimkhulu local Municipality, Cape Town.www.linkedin.com/inrosenfeldj. (accessed 01 may 2012).

Rust, U and Hanise, B. 2009. The impact of gender in the rural services environment of S.A Report to the water research commission. Water Geoscience Unit, council for Geoscience South Africa.

Saunders, Lewis, P and Thornhill, A. 2012. Research methods for Business students. 6th edition, Pearson. England

Schoch, D. 2007. South Africa's Water Reserve: Obstacles and Opportunities. A case study of the basic Human needs Reserve and basic water services in South Nsikazi and the Ecological Reserve in the Crocodile Sub – Catchment South Africa. Masters of science, African water issues research unit. Department of Water and Forestry, Wageningen University.
www.anthonyturton.com/admin/.../final_thesis_Danny_Schochl.pdf (accessed 28 October 2012) pp.51-75

Strachan, L. 2004. Sustaining best practices guidelines for rural water services. Tool kit for water services: Number 7.1 March 2004. Department of Water Affairs and Forestry. Pretoria

Schreiner, B., Van Koppen, B. and Khumbane, B. 2002. From bucket to basin: A new water management paradigm for poverty eradication and gender equity. In: Turton A and Hen wood R (eds) Hydro politics in the Developing World. A South African perspective. Pp.127-140.

© University of Venda

Sebola, M.P. 2000. Water supply scheme, scarcity and community development projects. A case study of Taaibo Schgroet village Northern Province. University of the North. Polokwane, South Africa.

Sichone, P., Mabiza, C. and Nyambe, I. 2007. An analysis of the impact of the operationalisation of institutions on rural livelihoods in Zambia.

Sigenu, K. 2006. The role of rural women in mitigating water scarcity. Master's degree in social sciences, in the faculty of the humanities at the University of Free State. Dissertation, University of the Free State, Bloemfontein. South Africa. pp. 52-70.

Statistic South Africa, 2009.

Tapel, B.N. 2012. Social water scarcity and water use. *Report to the water research commission*. African Centre for Water Research (ACWR).

Uitto, J.I. and Biswas, A.K. 2000.Water resource management and policy. Water for urban areas. United Nations: University Press.

UNESCO. Italian Funds – in – Trust for the fourth phase (2010-2012) of the United Nations World Water Assessment Programme (UN – WWWAP) Annual report 1 January – 31 December 2010. pp.. 5-20

United Nations Department of Economic and Social Affairs.2010. The Millennium Development Goal Summit Report.
http://www.un.org/millenniumgoals/pdf/MDG%20Report%20%2010%En%2or15%20r15%20low%2req%2020100615%-.pdf # page=60 (accessed 20 October 2011).

© University of Venda

Van Hofwegen, P.J.M. and Jaspers F.G.W. 2007. Analytical frame work for integrated water resource management. Guide lines for assessment of institution framework.

Van Niekerk and Dupisan, K. 2006. Water resources and water management in the Bahurutse heartland. *Water South Africa*, **32**(1 – 4):445 – 450.

Vhembe District Municipality, 2007 Quality in service IDP 2007/8 – 2011/12 (Approved version)www.vhembe.gov.za/.../reports/...

Vhembe District Municipality, 2012/13-2016/17 Integrated Development plan. A developmental municipality focusing on sustainable service delivery and social – economic development towards and equal society. pp.31-52.

Vhembe District Municipality 2012. A developmental municipality focusing on sustainable service delivery and social – economic development towards an equal society.*2012/13 2016/17 Integrated Development plans.*

Were, E., Roy, J. and Swallow, B. 2008. Local organisation and gender in water management. A case study from the Kenya Highlands Water partners International, Kisumu, Kenya. Copy right, John Wiley and sons Ltd.

World Health Organisation 2000. Global water supply and sanitation assembly report. http://www.who innt/water sanitation health/global assembly/global ITOC.htm. (accessed 2010 May 18).

World Health Organisation 2004. Guideline for drinking quality, volume 1. , 3rd edition.

© University of Venda

WHO UNICEF. 2012. Progress on Drinking Water and Sanitation. Progress on Drinking and Sanitation. United States of America.

World Water Day 2007. Coping with water scarcity challenges of the twenty – first century.

WHO/UNICEF 2012.Progress on Drinking Water and Sanitation, 2012 update. Joint monitoring programme, World Health Organisation and United Nations children's fund/.www.wssinfo.org/ (accessed 14 November 2012).

Wright, J.R., Gundry, S.W. and Conroy, R. 2004. Household drinking water in developing countries a systematic review of microbiological contamination between sources a point of use.Trop. med. Int. 106-117.

Wijk – Sijbesma, C. A., Mukhergeen, V. and Grooss, B. 2001. Linking sustainability with demand gender and poverty. A study in community-managed water supply projects in 15 countries International water and sanitation centre Washington DC and the Netherlands.

Wilson, Z., Malakoana, M. and Gounden, T. 2008. Trusting consumers – Involving communities in municipal water service decision mainly in Durban South Africa. *Journal of Water South Africa*, **34** (2): 141-145.

Ziervogel, G., Taylor, S., Thomalla, F., Takama, T. and Quinn, C. 2006. Adapting to climate and health stresses. Insights from Sekhukhune, South Africa. Copyright Stockholm Environment Institute United Kingdom: www.sei.se (accessed 20 July 2011) pp. 31-54

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APPENDICES
APPENDIX 1: Permission to conduct research from Traditional Council

LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

NKHENSANI TRADITIONAL COUNCIL

P.O Box 135
Elim Hospital
0960

Ref No : 7/3
Enq : Mthombeni M.S
Cell: 072 329 1173

2012-01-17

P.O BOX 1594
MAKHADO
0920

Dear Sir /Madam,

RE: PERMISSION TO COINDUCT RESEARCH : YOURSELF

Your application for conducting a research in our area has been approved by the Chief and his Councillors.

Your co-operation in this matter will be highly appreciated.

Yours faithfully: Chief: ----------

Councillor: H.J. Mgabi ----------

S.A.O : ----------

CO-OPERATIVE GOVERNANCE
HUMAN SETTLEMENTS & TRADITIONAL AFFAIRS
NKHENSANI TRADITIONAL COUNCIL
17 JAN 2012
P.O. BOX 135, ELIM, 0960
LIMPOPO PROVINCE

© University of Venda

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APPENDIX2: Permission to conduct Research from the Circuit

LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF
EDUCATION

VHEMBE DISTRICT

HLANGANANI NORTH CIRCUIT

DEPARTMENT OF EDUCATION
HLANGANANI NORTH CIRCUIT
20 DEC 2011
PRIVATE BAG X335 ELIM 0960
LIMPOPO PROVINCE

REF: 81051671

ENQ: BALOYI F.R

CELL: 079 497 1885/ 072 724 4440 20/12/2011

TO: MPAI N.E

RE: PERMISSION TO COINDUCT RESEARCH : YOURSELF

Please note that the Department has received your letter and takes pride in educators who take care of their professional development. It is within this spirit that the department grants you permission to conduct the research as requested at Shinguwa high school.

Do take note however that this permission is granted within the context and jurisdiction of the Ethics codes, therefore nothing in this letter precludes you from observing all the necessary ethics as you conduct the research.

Wishing you a successful study

Circuit Manager

Baloyi Falaza

..... 20/12/2011

LIMPOPO PROVINCE
PRIVATE BAG X335 ELIM 0960

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APPENDIX 3: Information on implementation of research and procedures.

SCHOOL OF AGRICULTURE

DEPARTMENT RURAL DEVELOPMENT AND PORVERTY ALLEVIATION

PRIVATE BAG X5050

THOHOYANDOU

0950

Email: sonto@classicmail.co.za

Mobile: 0826610333

: 0824924126

My name is Nomasonto Ethel Mpai; I am a registered student of University of Venda. I am conducting research for the purposes of obtaining a Master's degree in Rural Development. My area of focus is on the state of water supply at Chavani. The research will involve community members of Chavani and the different stakeholders in the community. I would like to invite community members and learners from Shinguwa High to participate in the study.

Participation in this research would entail responding to interview questions. The questionnaires consist of one typed page which will take 15 minutes of your time. Participation is voluntary, and no person will be advantaged or disadvantaged in any way. For choosing to participate or not to participate in the study. All your responses will be kept confidential; no information that could identify you would be included in the research report. The responses will not be read by any person, other than myself. You may refuse to answer any questions you would prefer not to, and you may choose to withdraw from the study at any point.

If you choose to participate in the study, please complete a consent form that will be attached and return it with the questionnaire. Please do not hesitate to contact me for any questions that you might have. My contact numbers are: Mobile: 0826610333 or 0824924126 and email address is: sonto@classicmail.co.za

Kind regards

.....

N.E MPAI

© University of Venda

THE STATE OF THE WATER SUPPLY SYSTEM AT CHAVANI VILLAGE SOUTH AFRICA

Researcher's Name: Nomasonto Ethel Mpai

Student Number: 11595912

School: Agriculture

Institute for Rural Development

You are invited to take part in a research study. The aim of this study is to investigate the state of water supply system in Chavani. The researcher wishes to learn more about the water situation in the area.

This study involves some questions with regard to the water situation in the Chavani village that you have to answer. The following information will help you to decide if you want to take part in this study. However before you agree, you should fully understand what is involved. If you do not understand the information or have any other questions do not hesitate to ask.

We would like you to complete a questionnaire, this may take about 15 minutes to complete. The researcher will wait for you to complete the questionnaire and will be willing to assist where ever you need help.

Your participation is voluntary, you can refuse to participate or stop at any time without giving any reason.

As you do not write your name on the questionnaire, you give us the information anonymously. Once you have given the questionnaire back to us you cannot recall your consent. It will be difficult to trace your information therefore you will also not be identified as a participant in any publication that comes from this study.

_____	_____	_____
Name of Participant	Date	Signature
_____	_____	_____
Name of Researcher	Date	Signature

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	Please Initial Box
1. I confirm that I have read and understand the information sheet for the above study and have had the opportunity to ask questions.	☐
2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving reason.	☐
3. I agree to take part in the above study.	☐
4. I agree to the interview / focus group / consultation being audio recorded	☐
5. I agree to the interview / focus group / consultation being video recorded	☐
6. I agree to the use of anonymised quotes in publications	☐

Statement of Consent to be photographed:

* I understand that photographs may be taken during the study.
* I consent to having my photograph taken.
* I consent to use of my photograph in presentations related to this study.
* I understand that if photographs are used for presentations of any kind my name will be used.

I……..consent for my photograph and name to be used in the study.

Name of Participant	Date	Signature
.....	.....	.....
Name of Researcher	Date	Signature

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APPENDIX 4: Questionnaire for individual members

Name of village.....

My name is *Nomasonto Ethel Mpai*. I am doing a research titled: "**Contributory factors to the collapse in the water supply at Chavani village within Makhado municipality, Vhembe district, South Africa**" for my Master's Degree in Rural Development (MRDV) at the Centre for Rural Development and Poverty Alleviation in the School of Agriculture at the University of Venda.

I would like to get your perception on the issues pertaining to water and water-related matters in your area. But before going deep into this, I would like to know a bit about yourself:

Please tell us a bit about yourself. Please note that this will be used for this research only and will not be shared with any third party person or organisation.

1. Your sex

Male	
Female	

2. Your age

15-25	
26-35	
36-45	
46-55	
55+	

3. Where do you stay?

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Mbhokota	
Riverplaas	
Chavani	
Nwaxinyamani	
Bokisi	

4. Your main occupation

Working full-time	
Working part-time	
Still studying	
Retired	
House wife	
Unemployed	

5. Your highest level of education?

Lower than matric	
Matric	
Certificate	
Diploma	
Degree	
Post-graduate	

6. How long have you been staying in this area?

Less than 1 year

2 - 5years

6 - 10 years

11+

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Where do you get water for domestic use?

Tap at home

Communal tap

Spring

River

Borehole

Buy from neighbours who have boreholes

6. How many days in a week do you get water from a communal tap?

1 – 2days 3 – 4days 5+

7. If you collect your water from a communal tap what time of the day is the tap opened for the community?

Morning		Afternoon		Evening	

8. What are the challenges associated with collecting water from the various sources?

.....

.....

.....

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9. Who decides on the time for opening the communal water taps?

.....

.....

.....

10. Who collects water for your family?

Mother		Father		Brothers	
Sisters		Helper		Myself	

11. If you buy water from your neighbour how much does it cost per 20 litre plastic container?

R1.00		R2.00		R3.00		R4+	

12. How far do you travel to collect water from the communal tap?

Less than 200 m

300 -400 m

500 -600 m

More than 1 km

13. How much water do you use per day? Give number of 20 litre containers.

2-3 4-5 6-7 More than 8

14. How does collecting water affect your daily activities?

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15. What other projects face challenges related to water situation? For each list the challenges:

.....

.....

.....

.....

.....

16. What has been done to address the challenges mentioned above?

.....

.....

.....

.....

.....

17. What are your perceptions on the management and arrangement of communal water supply sources?

.....

.....

.....

.....

18. Have you ever had a meeting to discuss water problems in your community?

Yes		No	

19. If the response is yes, who was responsible for calling the meeting?

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Community members		Community Leaders		Municipality		SANCO	

20. How often do you meet to discuss water problems in the community and who is responsible for calling the meeting?

.....

.....

.....

.....

23. What are the solutions to the problem of water in the village?

.....

.....

.....

.....

24. What are your own perceptions of the progress to solve the problem of water in the village?

Very little		Little		Much		Very much	

25. Please suggest possible solutions to the water supply problem in your community.

.....

.....

.....

.....

Thank you so much for your time

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APPENDIX 5: Focus Group Discussion Guide

Name of village.....

My name is *Nomasonto Ethel Mpai*. I am doing a research titled: "**Contributory factors to the collapse in the water supply at Chavani village within Makhado municipality, Vhembe district, South Africa**" for my Master's Degree in Rural Development (MRDV) at the Centre for Rural Development and Poverty Alleviation in the School of Agriculture at the University of Venda.

I would like to get your perceptions on the following:

1. What do you think of the water supply situation and challenges in the Nkhensani tribal authority?
2. What are your perceptions of the major water supply challenges and what do you think should be done?
3. Discuss the current institutional arrangements for the water supply in the area
4. Give your own perception of the effectiveness of the existing interventions
5. What do you think should be done to solve the water supply challenges?
6. What do you recommend as possible sustainable arrangements to solve the challenges?

Thank you so much for your time

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APPENDIX 6: Interview Guide

FOR THE COUNCILLOR / CHIEF AND THE VILLAGE WATER COMMITTEE LEADER

1 .What is the water supply situation in this area?

2. What are the major water supply sources used by the various community members?

3. What are the major challenges associated with each water supply option and for how long has this been going on?

4. What are your perception on what can be done to deal with the challenges and who do you think should take the leading role?

5. What has the community and its leadership done so far concerning the water supply challenges?

6. What are your perceptions on the progress so far in solving the matter?

7. What impact does it have on the various stakeholders in the community? (Women, children, farmers, business people, teachers and other institutions)

8. Can you please suggest possible institutional arrangements that may be used to solve the problem?

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APPENDIX 7: Interview guide for observations

1. How many are you in your family?
2. Who is responsible for collecting water at home?
3. How much time do you spend collecting water?
4. How often do you collect water from the well per week?
5. How many litres of water do you collect per day?

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APPENDIX 8: Attendents Register

NAME AND SURNAME	CONTACT NUMBER	SIGNATURE

DATE.....

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Figure 4.4: Women with babies at a water point



Source: Primary data

Case 4: A boy from a family of four collects water over the weekend when he is not at school. He collects six to nine containers per day on Saturday and Sunday. Whenever they have money, his family buys water from the neighbours. The boy reported that in his family, only boys collect water. Normally, they do their laundry at home and they use 75 litres of water for laundry. It takes 30 minutes to go to the well but up to an hour to travel back home resting along the way. On certain Saturdays when the government-sponsored water tanks deliver water, the boys do not have to go and collect water for up to two weeks. The time for filling up a 25 litre container was observed, when a person allowed the water to accumulate in the well before scooping it then it took six minutes to fill up the container. However, when water was

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