

**THE EFFECTIVENESS OF LOCAL GOVERNMENT IN  
WATER USAGE IN EZAKHENI TOWNSHIP**

by

**N.B. MAVUNDLA**

**2014172460**

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**SUPERVISOR: Dr. M.C.E. Schimper (D. Tech)**

(ii)

**Declaration**

I, Nhlanhla Mavundla, hereby declare that this extensive mini-dissertation for the Programme in Governance and Political Transformation at the University of the Free State (Bloemfontein) is my own original work and has not been submitted by me or any other individual at this or any other university. I also declare that all reference materials, used for this study, have been properly acknowledged.

.....

Name

Student number: 2014172460

(iii)

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# CHAPTER 1: ACTUALITY AND MOTIVATION OF THE RESEARCH

## 1.1 ACTUALITY/MOTIVATION

Before 1994 South Africa was racially divided. Black South Africans were underprivileged and they could not access many resources, for example water, electricity, and tarred roads, just to mention a few. Water is one of the most important substances on earth and it is a scarce resource.

Many African people in the country could access water through the following sources:

- a) Surface water - water which falls to the ground as rain or hail.
- b) Rivers or lakes – town or community water supplies are sometimes drawn directly from nearby rivers and lakes.
- c) Springs – found where underground water flows out of the ground naturally without the use of boreholes, wells, or pumps.
- d) Rock catchment areas and rock holes – large rock outcrops contain low areas in which water is trapped.
- e) Excavated dams – are made by scooping out soil to make a large shallow hole.
- f) Rainwater tanks – rainwater which falls onto the roofs of houses is often led via roof guttering through a pipe into a storage tank.
- g) Boreholes and wells – holes drilled into the ground deep enough to find a permanent (long-lasting) body of water.

The water which comes from these sources may be salty, cloudy, smelly, unpleasant or contain germs. Water of this kind would require special treatment to make it potable.

With the introduction of democracy the country adopted a very liberal Constitution, 1996 (Act No. 108 of 1996), which is underpinned by certain values and principles,

one of which is equality. After 1994 the majority of black citizens could access clean water. Without water there is no life on earth.

Despite having access to water, many communities and households remain vulnerable to the consequences of water scarcity. Because of the persistence of vulnerability there are expectations that Integrated Water Resource Management (IWRM) will translate into increased equity, reduced vulnerability and enhanced resilience, succeeding where in the past traditional water resource management has failed. To achieve IWRM water users should focus their activities on resource partition, appropriate land use, optimal water use and governance (Jonker, 2014).

Water is a scarce resource in South Africa. Most of South Africa's water is sourced from the Katse Dam in Lesotho through the Highlands Water Scheme. This means that communities throughout the country rely on municipal water to perform the various daily activities such as cooking, washing clothes, washing their bodies, keeping houses and the community clean, keeping plants alive in gardens and parks, and recreation, for example swimming pools. Water is essential for the healthy growth of farms crops and farm stock and is used in the manufacture of many products, like alcoholic beverages and soft drinks. It goes without saying, therefore, that water usage must be carefully managed. Water wastage is of great concern to government as plenty of water is lost through dripping taps and burst pipes. While communities ultimately pay for water wastage, government still has to foot the bill.

In most economies, decisions to provide goods and services to the community are taken by the public as well as the private sector. This means that the State has a role to play in the economic well-being of a country. In fact, the economic role of the State has become part of our daily lives. Government spends large sums of money to provide communities with services such as clean water, hospitals, roads, defence and security (Khalo, Mafunisa, Nsingo & Makondo, 2007:18-19).

Thus the State is needed to manage the scarce resources and make sure that these are utilised efficiently for maximum results. This means also that the scarcity factor dominates the argument of the role of the State in the economy. Government action

within the national economy is not seen as matter of choice, but of necessity (Visser & Erasmus, 2002:22).

## **1.2 RESEARCH PROBLEM**

The significance of this study lies in the fact that its findings can be used by local government to use and enforce the existing and available laws to prevent water wastage. This will also help government to identify the main water wasters that prevail within communities, e.g. broken community toilets, unsupervised communal taps and car-wash outlets. This study is also important in so far as it will help make people (i.e. communities) aware that water is very scarce and that each person's water wastage combined with that of people will lead to massive water losses and government will have to foot an ever-escalating bill.

The eagerness to conduct this study is also derived from the place in which the researcher lives, that is, Ezakheni Township. It uses water haphazardly and people in the area use water for watering. Many houses' water pipes are leaking and car wash businesses in the area should use water responsible. Many water pipes in the township have burst and are not fixed, many litres of water are lost and nobody takes responsibility in that regard, neither the community nor the municipality.

The researcher consulted the following resources in order to gain more data for the research project:

The Internet, Ilanga newspaper, district magazines and various books.

Water is an important fluid which is colourless, odourless, and tasteless and which forms the world's streams, lakes, oceans and rain and is the basis of the fluids of living organisms. Concise Oxford dictionary (1988) vs. "water" London, Oxford University Press.

Aside from being particularly thirst quenching, water performs a multiple of critical jobs on our parched planet (Atteberry, 2013). Water removes toxins from the body. It flushes toxins and waste from the body through urination and

perspiration. Water helps reduce constipation and aids in bowel movement which ensures that wastes are removed quickly and regularly before they can become poisonous in the body (Apec Water n.d.:1).

Water transports valuable nutrients to the body. Blood, which is 83% water, transports oxygen, CO<sub>2</sub>, nutrients, waste products and more from cell to cell. Urine is also mostly water and as another very important transporter, urine removes waste products from one's body (Cruising Chemistry n.d.:1).

Water regulates body temperature. The most important way water regulates body temperature is through sweat. The normal body temperature is 98.6 degrees Fahrenheit (Cruising Chemistry n.d.:3). The movement of water within the cellular system also transports vital blood plasma which is 92% water (Apec Water n.d.:1).

Water is also important in a diet process. Most people take water for granted. For the human body, water is truly a vital resource. You can go weeks without food but only five to seven days without water. When the water in your body is reduced by just 1% you become thirsty. At 5% muscle strength and endurance decline significantly and you become hot and tired. When the loss reaches 10% delirium and blurred vision occur. A 20% reduction results in death (Cruising Chemistry n.d.:1).

There is no more important nutrition for our bodies than water. No other substance is as widely involved in the process and makeup of the body. A man's body is about 60% water and a woman's is approximately 50%. The human brain is about 75% water. The other tissues are blood 83%, heart 79.2%, muscles 15.2%, and bone 22%. Every day we lose 2-3 quarters of water through urination, sweating and breathing. Since many of the processes within the body rely greatly on water, it is important that we replace our fluids regularly to compensate for this loss (Cruising Chemistry n.d.:1).

Our bodies must maintain a very specific pH level of 7.4. PH values of less than 6.9 and greater than 7.6 are life threatening and therefore it is essential to keep the pH level from deviating too far from normal. Water is a very important reactant in maintaining the pH at 7.4 (Apec Water n.d.:1).

### **1.3 AIM AND OBJECTIVES OF THE STUDY**

The aim of the study is to address the problem of water wastage in the community, especially in Ezakheni Township. In addition, one of the research projects' objectives is to help the affected community by providing adequate information and knowledge on water management. Another objective is to provide the Ezakheni residents in particular and South Africans in general with information on the dangers of not having drinking water.

A further objective is to review the current situation with regard to the governance of water services provision in South Africa and in Ezakheni Township in particular. This study will also describe the skills acquisition and learning offerings in the water leakage programmes and people's view point.

The researcher hopes that South Africans will also learn about the consequences of the continued misuse of this scarce resource by showing them how water scarcity affects people in other parts of the world. Clean drinking water is a luxury in many parts of the country, and as society becomes more and more urbanised, demand increases and supply cannot keep up. The KZN dams are drying up (Ilanga Newspaper, 05 February 2015: 10).

Looking into the following issues may provide answers:

- a) Exploring international and national laws governing water usage;
- b) Exploring the strategies by national and local government to save water;
- c) Exploring people's perception about water scarcity; and
- d) Exploring other means of using water effectively and efficiently.

## 1.4 RESEARCH METHODOLOGY

This study will be conducted in the qualitative research method. The researcher wishes to understand the issue of water wastage as the people of Ezakheni Township understand it. Qualitative research is about exploring issues (Mouton, 2003). It is also about understanding phenomena, and answering questions by analysing and making sense of unstructured data (De Vos, 1998). Qualitative research is designed to reveal a target audience's range of behaviour and the perceptions that drive it with reference to specific topics or issues. It uses in-depth studies of small groups of people to guide and support the construction of hypotheses. The results of qualitative research are mostly descriptive instead of being predictive (Mouton, 2003).

Qualitative research methods originated in the social and behavioural sciences: sociology, anthropology and psychology. Today, qualitative methods in the field of marketing research include in-depth interviews with individuals, group discussions (from two to ten participants is typical); diary and journal exercises; and in-context observations. Sessions may be conducted in person, by telephone, via video-conferencing and via the Internet.

Qualitative data collected through focus groups, in-depth interviews, content analysis, ethnography and evaluation are among the many approaches that are used. Qualitative research in its most basic form involves the analysis of any unstructured data, including: open-ended survey responses, literature reviews, interviews, audio recordings, videos, pictures and social media.

Open-ended questions will be used because they have a number of advantages, for example they:

- a) Enable the interviewer to test the limits of the respondent's knowledge;
- b) Allow the interviewer to make a more accurate assessment of what the respondent really believes;

- c) Allow the interviewer to probe so that he/she may go into more depth if he/she chooses, or to clear up any misunderstanding;
- d) Encourage co-operation and help establish good rapport; and
- e) Because they are flexible (Borg, 1989:277).

Qualitative research is naturalistic inquiry – that is, non-interfering data- collection strategies are used to discover the natural flow of events or phenomena and processes and how subjects would interpret them. Understanding individuals in terms of their own interpretations of reality and meaning. Qualitative research endeavours to describe and analyse the participant's individual and collective social actions, beliefs, thoughts and perceptions. In this way, the qualitative researcher will collect data by interacting with selected individuals in their specific settings and by obtaining relevant documents. Other useful resources will be documentary study comprising books, journals, official documents, magazine articles and Internet sources (Neuman, 1997:426-427).

The researcher will use interactive and non-interactive strategies when collecting data. The researcher will actually meet with participants when collecting data, while interviewing them, conducting case studies or when observing participants. During non-interactive strategies the researcher will not meet with the participants as the researcher studies or analyses the data, documents or when seeking patterns.

Qualitative research can be designed to contribute to theory, practice, policy, and social issues and action (McMillan & Schumacher, 2010:325). This study will focus on basic research as one of the functions of research. The purpose of basic research (sometimes called pure or fundamental research) is to know and explain by testing specific theories that provide broad generalisations (McMillan & Schumacher, 2010:13). Its purpose is to test theory without thought of application of results. Its concern is exclusively with knowing, explaining and predicting natural and social phenomena. In addition, the purpose is to increase the knowledge of basic principles and scientific laws, and to advance scientific inquiry and methodology.

The study aims to be descriptive as well as explanatory. It will provide answers through an in-depth description of the concept of leakages and wastages. On the other hand, the study will be explanatory in the sense that it will aim to establish the relationship between usage and wastage.

The use of mixed method research designs, which combines quantitative and qualitative methods, is becoming increasingly popular because the use of both approaches together can provide a more complete investigation. With mixed method designs, researchers are not limited to using techniques associated with traditional designs, either quantitative or qualitative (McMillan & Schumacher, 2010:25). The researcher is therefore attempting to use both methods to collect data, but the emphasis would be on qualitative method.

#### **1.4.1 Validity**

Validity means that the current procedures have to be applied by the researcher to find answers to a question. Validity in qualitative research refers to the degree of congruence between the explanations of the phenomena and the realities of the world (McMillan & Schumacher, 2010:330). Validity addresses these questions: Do researchers actually observe what they think they see? Do inquirers actually hear the meaning that they hear? According to Leedy & Ormrod, validity refers to whether the research answers its question and whether the search instruments used by the researcher perform the functions they are supposed to perform (Leedy & Ormrod, 2009). Do they collect the desired data? In other words, the research will be valid if the researcher gets the answers he or she wants.

A selection instrument does not need to be just reliable; it must also measure certain attributes that are essential for success in a research study. Where reliability refers to consistency and stability the validity refers to accuracy (Swanepoel, Erasmus & Schenk, 2008:281-282).

### **1.4.2 Data analysis**

Data analysis is a mechanism for reducing and organising data to produce findings that require interpretation by the researcher (Burns & Grove, 1998:744). Once the data has been collected it will be analysed by the researcher by comparing the meaning of the two terms wastage and usage. Data analysis will be featured by objectivity so that the research results will be accepted. The researcher will ensure that the data collection process is not biased. Questions put to the respondents will not be leading questions. The researcher will ensure that the data collected is relevant and applicable to the study.

Data analysis requires that researchers dwell with or become immersed in the data. Data analysis is done to preserve the uniqueness of each participant's lived experience while permitting an understanding of the phenomena under investigation. This begins with listening to the participants' descriptions and is followed by reading and rereading the verbatim transcriptions or written responses. It is critical to identify how statements or central themes emerge and connect to one another if the final description is to be comprehensive and exhaustive (Streubert & Carpenter, 1999:60).

Qualitative data analysis needs to be conducted with vigour and care (Coffey & Alkinson, 1990:89). In phenomenological research, the analysis begins as the first data is collected. The data collection may consist of no more than one interview.

## **1.5 RESEARCH DESIGN/LAYOUT**

The researcher will utilise the descriptive survey method to collect data. Data will be collected through observations, interviews, and document analysis. According to Leedy (1974), the descriptive survey method deals with the situation that demands the technique of observations as the principal means of characteristics as the qualitative research design.

The population of the study area will be carefully selected in order to reflect a representation of Ezakheni residents. The descriptive survey calls for the observation of the population under study, followed by the recording of the findings in

order to discover the meanings of what was observed. According to Wright (1986), observing the population under study does not always imply the physical 'look' or 'seeing' through the physical eye, but there are many ways in which we can 'see beyond' the population under study in the questionnaire.

Observational research often has no clearly defined research problems and questions may arise during the course of the study. For example, a researcher may notice unusual behaviour and ask, "What is happening?" or "Why?". In the case of Ezakheni Township with regard to "water wastage" or "water usage" the researcher tries to observe a phenomenon without interfering too much.

### **1.5.1 Limitations of the study**

Constraint may be felt where certain people may not want to take part or co-operate, or fail to respond to questions or provide certain data.

The cost of transport around the area of Ezakheni may have an impact on the study. Entry to some of the residents' houses may be difficult, because most houses are fenced and have dogs in their yards due to the high crime in the area.

### **1.5.2 Layout of chapters**

The layout of the study is as follows:

## **Chapter 1: ACTUALITY AND MOTIVATION OF THE RESEARCH**

This Chapter provides the actuality and motivation of the research, the problem statement, and aims and objectives of the study, methodology and overview of how the study was carried out.

## **Chapter 2: SPECIFIC PLACES THROUGHOUT THE WORLD THAT EXPERIENCE WATER SCARCITY**

Chapter two reviews water scarcity areas the world over with specific reference to deserts, islands, Botswana, the Seychelles and the United Arab Emirates.

## **Chapter 3: SOUTH AFRICAN LEGISLATION AND INTERNATIONAL POLICIES AROUND WATER USAGE**

In this Chapter international and South African policies are analysed. Furthermore, national laws and strategies around certain challenges already identified are discussed. These challenges include inter alia plant invasion, illegal use of water by commercial farmers and the “save water campaign”. Local government and specific policies to prevent water wastage are also highlighted.

## **Chapter 4: FIELDWORK AND EMPIRICAL DATA COLLECTION PROCEDURE**

Chapter four presents the methodology and collection procedures followed in the study, the research type, data collecting method and planning process of the empirical study.

## **Chapter 5: FINDINGS OF THE EMPIRICAL STUDY**

Chapter five summarises the findings and the results of the empirical study.

## **Chapter 6: SUMMARY, RECOMMENDATIONS AND CONCLUSION**

In this Chapter a summary of the findings is provided together with recommendations and the final conclusion.

# **CHAPTER 2: SPECIFIC PLACES THROUGHOUT THE WORLD THAT EXPERIENCE WATER SCARCITY**

## **2.1 INTRODUCTION**

Chapter one provided an introduction to the study, actuality, research problem and the research aims and objectives. The actuality/motivation and research problem were dealt with and outlined to make the case for this study.

The focus in this chapter is not on South Africa but also on other countries as well. The reason for that is to emphasize the importance of water. Water is a scarce commodity and people's lives depend on the availability and usage of water.

Chapter two consists of the literature review. The literature review will be structured as follows: water scarcity in desert areas; water scarcity at islands; the experiences of Botswana; the experiences of the Seychelles; and the experiences of the United Arab Emirates.

## **2.2 WATER SCARCITY IN DESERT AREAS**

A desert area is barren and very little precipitation occurs. This makes living conditions hostile for both plant and animal life. The lack of vegetation exposes the unprotected surface of the ground to the processes of denudation. About one third of the land surface of the world is arid or semi-arid (Wickens, 1998:05). This includes much of the polar regions where little precipitation occurs and which are sometimes called cold deserts. Deserts can be classified by the amount of precipitation that falls, by the temperature that prevails, by the causes of desertification or by their geographical location.

Deserts are formed by weathering processes as large variations in temperature between day and night put strain on the rocks which consequently break into pieces. Although rain seldom occurs in deserts, there are occasional downpours that can

result in flash floods. Rain falling on hot rocks can cause them to shatter and the resulting fragments and rubble strewn over the desert floor are further eroded by the wind this picks up particles of sand and dust and wafts them aloft in sand or dust storms. Wind-blown sand grains striking any solid object in their path can abrade the surface. Rocks are smoothed down and the wind sorts sand into uniform deposits. The grains end up as level sheets of sand or are piled high in billowing sand dunes. Other deserts are flat, stony plains where all the fine material has been blown away and the surface consists of a mosaic of smooth stones. These areas are known as desert pavements and little further erosion takes place. Other desert features include rock out-crops, exposed bedrock and clays once deposited by flowing water. Temporary lakes may form and salt pans may be left when waters evaporate. There may be underground sources of water in the form of springs and seepages from aquifers. Where these are found, oases can occur.

Plants and animals living in the desert need special adaptations to survive in the harsh environment. Plants tend to be tough and wiry with small or no leaves, water-resistant cuticles and often spines to deter herbivore. Some annual plants germinate, bloom and die in the course of a few weeks after rainfall while other long-lived plants survive for years and have deep root systems able to tap underground moisture. Animals need to keep cool and find enough food and water to survive. Many are nocturnal and stay in the shade or underground during the heat of the day. They tend to be efficient at conserving water, extracting most of their needs from their food and concentrating their urine. Some animals remain in a state of dormancy for long periods, ready to become active again when the rare rains fall. They then reproduce rapidly while conditions are favourable before returning to dormancy.

People have struggled to live in deserts and the surrounding semi-arid lands for millennia. Nomads have moved their flocks and herds to wherever grazing is available and oases have provided opportunities for a more settled way of life. The cultivation of semi-arid regions encourages erosion of soil and is one of the causes of increased desertification. Desert farming is possible with the aid of irrigation and the Imperial Valley in California provides an example of how previously barren land can be made productive by the import of water from an outside source. Many trade routes have been forged across deserts, especially across the Sahara Desert, and

traditionally were used by caravans of camels carrying salt, gold, ivory and other goods. Large numbers of slaves were also taken northwards across the Sahara. Some mineral extraction also takes place in deserts and the uninterrupted sunlight gives potential for the capture of large quantities of solar energy (Wickens, 1998:09).

### **2.2.1. Water supply and sanitation in Abu Dhabi**

The three cities of the Abu Dhabi Emirate within the United Arab Emirates – the coastal city Abu Dhabi itself (more than one million inhabitants) as well as the inland oases Al Ain (0,4 million inhabitants) and Liwa (about 0,1 million inhabitants) – receive their drinking water supply entirely from desalinated seawater. Their wastewater is being treated and reused for the irrigation of green spaces (The National, 2009).

#### **Water resources**

There are two main sources of water in the Abu Dhabi Emirate: Desalinated seawater and groundwater. While groundwater is used for agriculture in Al Ain and Liwa, drinking water is provided almost entirely from desalinated seawater across the Emirate. In 2008, groundwater contributed 71% to the total water demand for all purposes, desalinated water 24% and treated wastewater 5%.

#### **Seawater desalination**

In 2010, there were eight seawater desalination plants in Abu Dhabi owned and operated by eight joint ventures: Tawilah A, Tawilah B, the five Umm al Nar plants and the Al Mirfa plant. These joint ventures between the government and foreign companies, which are allowed to own up to 40% of the shares, are called Independent Water & Power Producers (IWPPs). They operate under Build-Own-Operate (BOO) contracts with the government and their energy is supplied by fossil fuels. In the model green city called Masdar City, four smaller pilot desalination plants that will use solar power are nearing completion as of early 2015.

## **Groundwater**

90% of groundwater in the Abu Dhabi Emirate is saline, in some cases up to eight times as much as seawater. There are only two freshwater aquifers. Natural groundwater recharge is estimated at about 300 million cubic metres per year. Brackish groundwater is mostly used for the irrigation of date palms which are relatively salt-tolerant. Recharge dams have been built on wadis in order to prevent flood water to flow into the sea, recharging it instead to aquifers. Unplanned and uncontrolled groundwater withdrawals, especially for agriculture and forestry, total over 2,000 million cubic metres per year and have resulted in declining groundwater levels and quality.

### **Groundwater recharge**

Artificial groundwater recharge with desalinated seawater was piloted in 2003 near the Liwa Oasis and construction of large-scale recharge facilities has begun in 2008. The objective is to create a 90-day reserve instead of the current 48-hour reserve for drinking water supply, in order to protect the emirate against the risk of terrorist attacks or oil spills that would shut down the entire water supply. Recharge will occur during summer when the desalination plants generate surplus freshwater. Desalination plants in Abu Dhabi use the multi-stage flash distillation technology which uses steam from thermal power plants as an energy source. Their water production thus is proportional to electricity production and reaches a peak during the summer when electricity production is highest to power air conditioning. The recharge scheme is currently under construction and is due to be completed by 2013 (The National, 2009).The researcher hopes it is completed by now.

## **Sanitation**

Approximately 550,000 cubic metres of wastewater is generated in Abu Dhabi every day and treated in 20 wastewater treatment plants. Almost all of the wastewater is being reused to irrigate green spaces. While most wastewater treatment plants are publicly owned and operated, four large new plants have been built by joint ventures under build-own operate transfer (BOOT) arrangements. One such contract for two plants was awarded in 2008, one in Abu Dhabi itself with a capacity of 300,000 cubic

metres per day and one in Al Ain with a capacity of 130,000 cubic metres per day (The National, 2009). Contracts for two other plants were awarded to Biwater under a similar structure. A Strategic Tunnel Enhancement Programme (STEP) is to be implemented between 2008 and 2014 to establish a tunnel that will comprise 40 kilometres of a deep sewerage tunnel and two new large pumping stations to relieve Abu Dhabi Island.

In Masdar City green spaces and agriculture near the city are to be irrigated with grey water and reclaimed water.

### **Water use**

About half of the annual water production from all sources is used for irrigation of green spaces, as well as in agriculture. The other half is used for domestic uses. Freshwater use per capita is about 650 litres per day, including water supplied for the irrigation of green spaces.

As of 2009, in Al Ain "due to constraints on both the transmission and distribution networks, up to 45 per-cent of customers (were) on a restricted (intermittent) supply" (The National, 2009).

### **History**

Abu Dhabi.

Abu Dhabi has witnessed an explosion of wealth and population since its independence in 1971 and the oil boom of 1973. Before, groundwater was the only source of water supply. It was very scarce, since there is little recharge and most of the aquifers are highly saline. It was only through seawater desalination that the growth of Abu Dhabi became possible. Seawater desalination used thermal technologies that couple desalination with power production. Water was provided free of charge. The plants were initially owned and operated by the government through the Water and Electricity Department, and financing was provided by the State from oil revenues (The National, 2009).

### **2.2.2. Water availability in Namibia**

Namibia's climate is hot and dry with erratic rainfall. Within Africa its climate is second in aridity only to the Sahara. Namibia shares several large rivers, such as the Orange River in the South as well as the Zambezi and Okavango Rivers in the North. But these rivers are far away from the population centres and the cost of tapping them for drinking water supply is prohibitive. Only the Cunene River, which is shared with Angola, provides drinking water for four northern regions of Namibia (WHO and UNICEF, 2012).

The total assured safe yield of Namibia's water resources is estimated at 660 million m<sup>3</sup>/year, distributed as follows: groundwater 300 million m<sup>3</sup>/year, ephemeral rivers 200 million m<sup>3</sup>/year, perennial rivers 150 million m<sup>3</sup>/year and unconventional sources such as treated wastewater 10 million m<sup>3</sup>/year. Total water consumption in Namibia was estimated at 300 million m<sup>3</sup> in 2000. The municipal sector used 73 million m<sup>3</sup> (24 per cent). Reuse of water is practised in Namibia in many urban areas such as Swakopmund, Walvis Bay, Tsumeb, Otjiwarongo, Okahandja, Mariental, Oranjemund and Windhoek. In Windhoek, reclamation of water for potable reuse has been practised since 1968. The plant could supply 8 000 m<sup>3</sup>/day, which was about 19 per cent of the average daily water demand of the city in 1997. A new reclamation plant with a capacity of 21 000 m<sup>3</sup>/day was completed in 2002 (Food and Agriculture Organisation (FAO), 2005).

Mining in Namibia makes extensive use of water resources. Particularly along the Atlantic coast there is little alternative to extracting groundwater from aquifers. For this reason the first large desalination plant in sub-Saharan Africa was inaugurated by Areva on the 16 April 2010. The plant is located near Wlotzkasbaken, 30 km north of Swakopmund. Its maximum capacity is 20 million m<sup>3</sup> per year (AllAfrica, 2010) but it will initially supply 13 million m<sup>3</sup>. Its main projected use is to supply the uranium mine at Trekkopje, located 48 kilometres (30 mi) inland (AllAfrica, 2009).

### **Water supply**

Namibia is the only country in sub-Saharan Africa to provide water through municipal departments. The only bulk water supplier in Namibia is NamWater, which sells it to

the respective municipalities which in turn deliver it through their reticulation networks. In rural areas, the Directorate of Rural Water Supply in the Ministry of Agriculture, Water and Forestry is in charge of drinking water supply.

The UN evaluated in 2011 that Namibia had improved its water access network significantly since independence in 1990. A large part of the population cannot, however, make use of these resources due to the prohibitively high consumption cost and the long distance between residences and water points in rural areas. As a result, many Namibians prefer the traditional wells over the available water points far away (AllAfrica, 2011).

### **Financial aspects**

Namibia spends about 3% of its Gross Domestic Product on the operation expenditures of its water utilities. This is by far the highest percentage of all sub-Saharan countries (Banerjee, Skilling, Forter, Bricen-Garmedia, Morella Chfadi. 2009:56). Per capita, Namibia spends about 80US\$ annually on water supply and sanitation, other countries in the region spend between 1 and 10 US\$. Providing access to utility water in Namibia costs 4,000 US\$ per capita on average (Banerjee, *et al.* 2009:60-61).

### **Sanitation**

Compared to the efforts made to improve access to safe water, Namibia is lagging behind in the provision of adequate sanitation. This includes 298 schools that have no toilet facilities. Over 50% of child deaths are related to lack of water, sanitation, or hygiene; 23% are due to diarrhoea alone. The UN has identified a "sanitation crisis" in the country (AllAfrica, 2011)

Apart from residences for upper and middle class households, sanitation is insufficient in most residential areas. Private flush toilets are too expensive for virtually all residents in townships due to their water consumption and installation cost. As a result, access to improved sanitation has not increased much since independence: In Namibia's rural areas 13% of the population had more than basic sanitation, up from 8% in 1990. Many of Namibia's inhabitants have to resort to

"flying toilets", plastic bags into which they defecate, which are flung into the bush after use. The use of open areas close to residential land to urinate and defecate is very common and has been identified as a major health hazard (AllAfrica, 2014).

### **2.2.3. Water availability in Morocco**

Water supply and sanitation in Morocco is provided by a wide array of utilities. They range from private companies in the largest city, Casablanca, the capital, Rabat, and two other cities, to public municipal utilities in 13 other cities, as well as a national electricity and water company (ONEE). The latter is in charge of bulk water supply to the aforementioned utilities, water distribution in about 500 small towns, as well as sewerage and wastewater treatment in 60 of these towns (Ciriec, 2008).

There have been substantial improvements in access to water supply, and to a lesser extent to sanitation, over the past fifteen years. Remaining challenges include a low level of wastewater treatment (only 13% of collected wastewater is being treated), lack of house connections in the poorest urban neighbourhoods, and limited sustainability of rural systems (20 per cent of rural systems are estimated not to function). In 2005 a National Sanitation Program was approved that aims at treating 60% of collected wastewater and connecting 80% of urban households to sewers by 2020. The issue of lack of water connections for some of the urban poor is being addressed as part of the National Human Development Initiative, under which residents of informal settlements have received land titles and have fees waived that are normally paid to utilities in order to connect to the water and sewer network.

## **Water resources**

### **Conventional water resources**

Morocco has about 22 billion cubic metres of conventional renewable water resources per year equivalent to 730 cubic metres/capita/year. Before taking into account drought years of the 1990s and 2000s, the total renewable water resources were estimated to be much higher at around 29 billion cubic metres (World Resources Institute, 2002). However, only up to 20 billion cubic metres per year can

be economically captured (resources mobilisables), including 16 billion m<sup>3</sup> of surface water and 4 billion m<sup>3</sup> of groundwater. Morocco has about 100 dams of various sizes with a total storage capacity of 15 billion cubic metres. It was estimated that in 2004 about 13.5 billion m<sup>3</sup> were withdrawn or about 67% of available resources. 83% of withdrawals were for agriculture and 17% for municipal and industrial uses. However, water resources are not divided equally in space and time, with most of the water resources available in the north and rainfall limited to the winter. In addition, the quality of water resources is degraded through pollution, in particular in the Sebou basin.

Morocco is divided into seven major river basins and a number of smaller basins. The seven major basins from north to south are the Loukkos River, the Moulouya River, the Sebou River, the BouRegreg River, the OumEr-Rbia River, the Tensift River and the Souss-Massa basin. Except for the Loukkos River, all these rivers originate in the Atlas Mountains. There are few inter-basin transfers in Morocco, the most important ones being the Rocade canal from the OumEr-Rbia basin to the Tensift basin near Marrakesh, a transfer from near the mouth of the Oumer-Rbia to Casablanca and a transfer from the Bouregreg River also to Casablanca. There are tentative plans for a large north-south water transfer project with an average conveyance capacity of around 2.74 million cubic metres/day (0.75 billion m<sup>3</sup>/year) over 500–600 km from the Sebou River basin to the water-stressed Tensift basin (Global Water Intelligence, 2009).

Water use for municipal and industrial uses was about 2.28 billion m<sup>3</sup> in 2003, of which 0.7 billion m<sup>3</sup> (31%) were from groundwater and 1.58 billion m<sup>3</sup> (69%) from surface water. Groundwater resources are overexploited in parts of the country, in particular in the Sous-Massa area in the south where irrigation is the predominant water user.

### **Wastewater treatment and reuse**

So far there is limited planned reuse of reclaimed water in Morocco, given that only 13% of the collected wastewater undergoes any treatment. In 2009 there were more than 100 wastewater treatment plants in Morocco, mostly serving small and medium-sized towns located in the interior or the country. The first wastewater treatment

plants in Morocco were built by small municipalities using a wide range of technologies. Because of the limited financial and technical capacities of those municipalities practically all of these 28 plants ceased functioning shortly after they were completed. This triggered a decision in 2000 to gradually transfer the responsibility for sanitation in small and medium-sized towns to the national utility ONEP. In 2009 the latter built or was in the process of building 43 plants, mostly using the stabilisation pond technology, but also one activated sludge plant and a few trickling filter plants. The track record of operating these plants is better than for the plants operated by municipalities, partly because the predominant technology - stabilisation ponds - does not require electricity. Their lower operating costs make them less vulnerable to disruptions in the case of strained operating budgets. In larger cities, only very few municipal utilities (Régies) operate wastewater treatment plants. Their track record at operating them is mixed: A plant operated by the Agadir utility works well, while plants operated by the utilities of BeniMellal and Nador do not function. These plants use the activated sludge technology which requires electricity. The Marakkech utility was constructing a large plant in 2009, and the Fes utility was in the process of bidding for a plant. This process experienced a setback when the French development agency AFD and the European Investment Bank withdrew their financing for the plant, citing non-respect of tender procedures as the reason (Global Water Intelligence, 2009).

Compared to the overall water use in Morocco, reclaimed water can only provide a fraction of the country's increasing water needs. Furthermore, there is no regulatory framework for water reuse and no established system to recover the costs for reclaimed water from users. The country's largest reuse project is currently under construction in Marrakech, where reclaimed water from a 90,000 m<sup>3</sup>/day plant will be reused primarily to irrigate golf courses. The tertiary treatment and the network to distribute the reclaimed water will be financed by private investors. Redal, the utility serving Rabat, was carrying out a study in 2009 to assess the feasibility of wastewater reuse to irrigate green spaces in the city (Global Water Intelligence, 2009). Besides this there have been a few scattered small-scale pilot reuse projects since the 1980s, some of which have been abandoned. Among the sustainable projects is a project to irrigate golf courses in Ben Slimane that has been operating since 1997 with a capacity of 5,600 cubic metres/ day. In 2009 a large reuse project

was planned in Agadir to irrigate a golf course and municipal gardens with 50,000 cubic metres/ day. In 2009 there were also two projects for direct, planned reuse in agriculture in Oujda and BeniMellal. These projects are financed by the National Environmental Fund. In 2009 the water department of the State Secretariat for Water and Environment carried out a national study for water re-use.

## **Desalination**

Morocco is increasingly looking towards seawater desalination as a source to supply its increasing water needs for drinking, industry and mining. The Secrétariat d'État chargé de l'Eau et de l'Environnement has commissioned a study on desalination due to be completed by the end of 2009. Among others, the study foresees a very large new desalination plant in the Casablanca region with a capacity of around 685,000 m<sup>3</sup>/day (250 million m<sup>3</sup>/year), or more than 10% of total municipal water use in Morocco (Global Water Intelligence, 2009).

In May 2014 the national utility ONEE signed a Build-Operate-Transfer contract for a 100,000 m<sup>3</sup>/day reverse osmosis seawater desalination plant in Agadir with a consortium between the Spanish firm Abengoa Water and the investment fund InfraMaroc. The project had been under preparation for seven years. The payment is in local currency and the Abengoa-led consortium was the only one that submitted a bid for the project that other firms considered to be too risky (Global Water Intelligence, 2009).

## **Access**

In 2011, 82% of the population of Morocco had access to an improved water source. Specifically, this means that 59% of Moroccans had access to piped water in their house or in the yard of their house. As of 2004, for 11% the main source of water supply was a public stand pipe, for 5.6% it was a protected well. 1.5% of Moroccans, essentially in rural areas, relied on rainwater harvesting as their principal water source. 7% collected water from springs. Half of these springs, supplying 3.5% of the population, were estimated to be protected. All the above sources are considered as improved water sources by the WHO, thus bringing the total to 82% (Joint Monitoring Program for Water and Sanitation, 2012).

18% of the population did not have access to an improved water source. This share is split up as follows: 1%, both in urban and rural areas, used water from tankers as their main water source. 7% collected water from unprotected public wells and 4% from unprotected private wells inside their home or yard. 2.5% took their water directly from rivers and open reservoirs. Another 3.5% were estimated to use an unprotected spring as their main source of water supply, so that in total 18% of the population lacked access to an improved water source (Joint Monitoring Program for Water and Sanitation, 2012).

In rural areas women wash clothes as shown here on the Dades River. With increasing access to tap water and standpipes this practice has become less common.

Concerning sanitation, 83% of the urban population and 52% of the rural population had access to an improved sanitation facility in 2011. 14% of the urban population used shared latrines, which do not count as improved sanitation. 6% of the rural population used shared latrines, and 38% were estimated to defecate in the open. It is the poorest who have no access to sanitation: A 2004 World Bank study noted that sewerage service is completely lacking in the peri-urban areas of secondary urban centres. Slums scattered across the bigger metropolitan areas are also deprived of access to the sewerage collection network, reinforcing the health risks and poverty stigma in those neighbourhoods (World Bank, 2004).

### **Service quality**

Water supply is continuous in almost all medium and large urban centres. In the city of Layoune, which is served by a seawater desalination plant that has insufficient capacity to supply the entire city, water supply was intermittent in 2010. Only about 13 per cent of collected sewage is being treated before being discharged into the environment (World Bank, 2010).

## **History and recent developments**

### **Private service provision during the Protectorate**

During the French Protectorate, beginning in 1912, water supply and sanitation in many large cities in Morocco were managed under a concession to the private company Société Marocaine de Distribution de Eau, de Gaz et del' Electricité (SMD). SMD, a consortium led by Lyonnaise des Eaux, provided services in Casablanca, Rabat, Salé, Tangiers and Meknes. Since 1950 SMD also managed a vital bulk water transfer project: The supply of water from the Oumer-Rbieriver to Casablanca. Bulk water supply to other cities that were not able to supply themselves from local water sources was a responsibility of a public company called Régie d' Exploitation Industrielle du Protectorat (REIP) created in the early 1930s. The foundations for two important elements of today's water and sanitation sector - private concessions for water distribution in large cities and a national public company for bulk water supply - were thus already laid during the Protectorate.

### **Nationalisation after independence**

After independence in 1956 water distribution systems were nationalised and handed over to public companies in the major cities, the so-called Régies. The bulk water supply system from the OumEr-Rbia River to Casablanca remained in the hands of the private concessionaire SMD. Bulk water supply in the rest of the country was entrusted to a new national water company created in 1972, the Office National de l'Eau Potable (ONEP).

### **New water resources management law and rural water programme (1995)**

In 1995 a new, comprehensive Water Law (Loi 10-95) was passed. Aimed at changing the emphasis of water resources management from supply expansion to demand management it was considered a "paradigm shift" at the time. It foresees measures to promote water use efficiency, better allocation of water resources and the protection of water quality through the application of the user-pays principle and the polluter-pays principle. The law also provided the legal basis for the establishment of river basin agencies for integrated water resources management,

inspired by examples of such agencies in France and Spain, among other countries. In 1996 the OumEr-Rbia agency was established as the first basin agency in Morocco. In 2000, agencies in the country's other six major basins were created. However, the implementation of the basin agencies took many years and they still remain relatively weak entities. More than a decade after having been passed the law it is still not fully implemented.

Also in 1995, the government launched an ambitious Rural Water Supply Programme (Programme d'Approvisionnement Groupé en Eau Potable des Populations Rurales - PAGER) to face the challenge of very low access to potable water in rural areas. The programme is carried out by ONEP, whose responsibility was extended from urban to rural areas through the programme (see also below under innovative approaches and international good practice).

### **Water privatisation in the late 1990s**

Since the Régie serving Casablanca had a poor service record the government decided in the mid-1990s to bring in a private company to manage the city's water, sewerage and power networks. In 1997 a consortium called Lydec, led by Lyonnaise des Eaux (now SUEZ), was awarded the 30-year concession without a competitive tender. The Casablanca concession paved the way for subsequent concessions in Rabat, Tangiers and Tetouan. While the Rabat concession was awarded directly to Vivendi in 1998, the concessions in Tangiers and Tetouan were awarded in 2002 after competitive bidding to Amendis, a subsidiary of Vivendi.

In 2000 the initial 50-year concession of SMD, a subsidiary of Lyonnaise, for bulk water supply to Casablanca was renewed.

### **National Sanitation Programme**

In 2000 the ONEP Law was amended to include sanitation (sewerage and wastewater treatment) in ONEP's mandate. At the same time wastewater tariffs (redevanced'assainissement) were first introduced, albeit at a very low level of less than 1 Dirham/m<sup>3</sup>, and a modest subsidy programme was set up. In 2005 this policy

was reinforced by the more ambitious National Sanitation Programme (Programme National d'Assainissement - PNA).

### **Creation of ONEE through the merger ONEP and ONE**

During a cabinet reshuffle after elections in 2007 the Ministry of Environment and Water on the one hand, and the Ministry of Energy and Mining on the other hand, were merged into a single "Super Ministry". Within the Ministry, a State Secretary remains in charge of water and environment. The Ministry of Environment and Water was created in 2002, grouping together responsibilities that were previously scattered over several Ministries.

In 2009 the Cabinet approved a bill (Loi 40 09) that foresees a strategic alliance (regroupement) between ONEP and the national electric utility ONE. The objective is to extend economies of scale in billing and maintenance, which are already achieved in the concessions and the Regies in the larger cities, to other areas of the country. The bill is inspired by reform proposals that were put forward in various studies, including one by the management consulting firm McKinsey carried out for the Ministry of Interior in 2004. In September 2011 the bill was approved by Parliament and the new entity, the Office National de l'Electricité et de l'Eau Potable (ONEE), was created. The former ONEP became its "water branch".

### **International good practice and innovative approaches**

Among the various activities in water and sanitation in Morocco initiated over the past two decades, the rural water and sanitation programme PAGER has been recognised as international good practice by the United Nations. In addition, an innovative output-based aid project to expand access to water and sanitation was initiated in 2007.

### **The rural water supply programme PAGER**

In 2004 the national rural water supply programme PAGER received the United Nations Public Service Award in the category 'Improvement of Public Service Results'. The project relies on two basic principles: the use of simple technologies and the participation of beneficiaries in all stages of the project from the needs

assessment to design, implementation and evaluation. The US\$1bn programme initiated in 1995 aims to reach 12 million people until 2010. The programme has relieved women and children from the burden of carrying water (United Nations, 2004). A 2001 World Bank evaluation showed that school enrolment in beneficiary communities increased by 16% (Zahoud, 2004).

According to official data and reports by the Moroccan media, PAGER increased access to water in rural areas from 14% in 1995 to 61% in 2004 and 77% in 2006. According to survey data, access to house connections in rural areas increased from 10% in 1995 to 20% in 2004. According to the same survey data, access to an improved water source in rural areas remained constant between 1995 and 2004 at 58 (Joint Monitoring Program for Water and Sanitation, 2008). It remains unclear how the survey data and the data of PAGER can be reconciled.

### **Output-based aid to expand access to water and sanitation**

In 2007, the private concessionaires in Casablanca, Tangiers and Tetouan, as well as the public water utility of Meknes, began to implement water supply and sanitation pilot projects on the basis of an innovative output-based aid approach. The objective is to extend water and sewer connections to 11.300 households in poor, unzoned, peri-urban neighbourhoods. The pilot projects are part of the National Human Development Initiative and are funded through a US\$ 7 million grant by the Global Partnership for Output-Based Aid (GPOBA) administered by the World Bank. It is the first time that GPOBA, which promotes primarily the private sector, provided grants to a public water operator. The average subsidy level per connection amounts to USD 169 for water supply and to USD 606 for sanitation. The average subsidy level per connection is 35 per cent. Operators also developed awareness raising campaigns through teams that go to market places to make people aware of the option to connect to sewers. Under the output-based aid approach investments are pre-financed by the concessionaires or the public utility that are being reimbursed by GPOBA only after a verification process certifies that the households have been connected and receive an adequate service. According to the World Bank, the output-based aid approach has helped to improve processes, overcome financing obstacles and mobilise stakeholder partnership (Chauvot de Beauchene & Mantovani, 2009).

## **Sector responsibilities**

The key actors at the policy level in the sector are the Ministry of Energy, Mining, Water and Environment in charge of water resources management and the Ministry of Interior in charge of water supply and sanitation. At the level of service provision, key actors are the national electric and water utility ONEE, 3 private operators and 13 municipally owned utilities. The country's largest city, Casablanca, is served by the private operator Lydec. In addition to the above institutions, seven basin agencies are in charge of water resources management. These institutions are, however, still relatively weak.

Overall, the sector is characterised by a complex and fragmented institutional framework, which - according to a 2004 World Bank report - "has hindered the formulation of a comprehensive sector-wide vision and the establishment of coherent policy objectives" (World Bank, 2004).

## **Policy and regulation**

The highest political authority in the Moroccan water sector rests with the Higher Council for Water and Climate (Conseil Supérieur de l'Eau et du Climat) under the Prime Minister and the Honorary Presidency of the King. It was created in 1996, replacing an earlier Higher Council created in 1981. It includes representatives of all the Ministries involved in water, representatives of regional governments and water user associations, as well as academics, professional associations and trade associations. Although the council is supposed to meet once a year as per its founding decree, it last met in 2001. Its last previous meeting was held in 1994. According to the same decree the secretariat function for the Council is assured by the Ministry of Public Works. However, all water-related functions were moved from the Ministry of Public Works to the newly created Ministry of Water and Environment in 2002.

Within the government of Morocco responsibilities for water supply and sanitation are shared by various Ministries. The Ministry of Energy, Mining, Water and Environment (Ministère de l'Energie, des Mines, de l'Eau et de l'Environnement) is in charge of water resources management and bulk water supply, while the Ministry of

Interior is in charge of supervising water distribution and sanitation carried out by municipal utilities. Within the Ministry of Interior the Direction de l'Eau et de l'Assainissement (DEA) assists local governments with water and sanitation issues, and plays an active role in planning, implementing, and supporting the operations of basic water and sewerage infrastructure. The Directorate of Public Utilities and Concessions (DRSC), also in the Ministry of the Interior, monitors the performance of Régies and concessions.

Certain sector responsibilities are within the realm of other Ministries. The Ministry of Public Health (Ministère de la Santé Publique, MSP) is the main water quality regulator in the sector, responsible for setting and enforcing public health drinking water standards. The Directorate of Public Corporations and Privatisation of the Ministry of Finance oversees the fiscal aspects of public utility operations, and the contracting of concessions. Furthermore, an Interdepartmental Commission on Prices approves proposals for tariff increases.

### **Water resources management**

The OumEr-Rbia River in central Morocco is the country's longest river. Besides being an important source of water for irrigation, it supplies most of the drinking water for the country's largest city, Casablanca.

Nine river basin agencies are responsible for the management of water resources in Morocco. River basin agencies have a number of important responsibilities. They authorise water abstractions and wastewater discharges for all users, based on a basin master plan (Plan Directeur d'Aménagement Intégré des Ressources en Eau, PDAIRE) that they prepare. They also collect charges for abstraction and effluent discharges. They are also supposed to provide financial help and technical assistance to service providers for the prevention of water pollution and the efficient use of water resources. They also monitor the quality and quantity of both surface and groundwater and are in charge of managing water-related emergencies. Finally, they should increase public awareness about water resources. The agencies cover the following basins ranked in the order of the available water resources in each basin: Sebou River, Moulouya River, OumEr-Rbia River, BouRegreg River, Tensift River, Loukkos River and the Souss-Massa basin, Ziz-ErGheris et Sakia el Hamra-

OuedEddahab. The means available to the basin agencies are largely insufficient to carry out their functions.

### **Service provision**

There are four categories of urban service providers in Morocco: private concessionaires (38% of urban water customers), municipal utilities (31%), the national public company ONEE (28%), and municipalities providing services directly (3%). De jure, according to the municipal code of 1976 (Charte Communale), amended in 2002 and 2008, public services such as water supply, sewerage and electricity distribution are the responsibility of municipalities (communes). There are 1,547 municipalities in Morocco, including 249 urban and 1,298 rural municipalities. As mentioned above, some municipalities have delegated service provision to private concessionaires. In other municipalities the Régies provide these services, often not on the basis of a specific contract. In the smaller municipalities ONEE often provides services, either with or without a contract (Contrat de Gestion Déléguée) with the municipality. In the case of sewers, many smaller municipalities still provide this service directly, although there is a policy to gradually transfer sewer services to ONEE.

The 2008 amendment to the municipal code allowed for the creation of municipal associations (Groupement d'Agglomérations Urbaines).

### **Private concessions**

Water and sewer services in the city of Tangiers on the Straits of Gibraltar are run by the private company Amendis, a subsidiary of Veolia Environnement of France.

Three private multi-utility concessionaires provide drinking water, sewerage services and electricity in Casablanca, Rabat, Tangiers, and Tetouan. Lydec, the concession holder in Casablanca, is owned by SUEZ Environnement (51%), the Moroccan insurance company RMA Watanya (15%) and the Moroccan investment company FIPAR-Holding (19.75%). In addition, 14.25% of the shares are traded on the Casablanca stock exchange since 2005. Amendis, the concession holder in Tangiers and Tetouan, and Radel, the concession holder in Rabat, were subsidiaries of the

French multi-national Veolia Environnement ([www.veolia.com](http://www.veolia.com)). In 2013 Veolia sold its Moroccan subsidiary Veolia Environnement Maroc that holds the concession to the British private equity group Actis Capital for €370 million after requests for tariff increases had been denied by the authorities. The company had also been criticised for failing to reach its investment targets, in particular concerning access to the poor.

A fourth concessionaire provides bulk water to Casablanca.

### **Municipal utilities: Régies autonomes**

Water supply and sanitation in the Mediterranean city of Nador was transferred to ONEP after the municipal utility RADEEN was unable to clean up the Nador lagoon.

Twelve specialised municipally owned public operators called Régies autonomes provide water in 12 medium to large cities. The same operators also provide sanitation in 11 cities and electricity distribution services in 7 cities. The largest of the cities served by Regies autonomes are Agadir, Fes, Marrakech, Meknes and Oujda. Regies also exist in Chaouia, El Jadida, Kenitra, Larache, Safi, Tadla and Taza. Many of these utilities are owned by several municipalities (Régies intercommunales). The Régie Autonome de Distribution de l'Eau et de l'Electricité de Nador (RADEEN) was taken over by ONEP in about 2007 as a result of the utility's failure to properly clean up the highly polluted lagoon of Nador.

### **The national utility ONEE**

ONEE (Office National de l'Electricité et de l'Eau Potable) is an electric utility and a bulk water provider that produces 80 per cent of the country's drinking water and sells much of it to the Regies and the private concessionaires. It also distributes water directly to customers in about 500 medium to small towns. ONEE has also taken over sanitation services in more than 65 of the towns where it distributes drinking water by 2009, and it is expected to take over sanitation services in a total of 191 towns by 2017. Furthermore, ONEE provides water through stand posts to one third of the rural population that has access to an improved source of water. ONEE (Office National de l'Ectricité et de l'Eau Potable) was created through an alliance of the power company ONE and ONEP.

## **Direct service provision by municipalities: Régies directes**

Forty municipalities in small towns serve 3 per cent of urban customers with water (Régies directes) through "non-professional and underfunded municipal departments". They also provide sewerage services in 280 towns (Ciriec, 2008).

## **Associations**

The Moroccan Association for Water Supply and Sanitation (Association Marocaine de l'Eau Potable et de l'Assainissement - AMEPA) is a trade association created in 1997 to "address upcoming challenges and defend the sector's interests". It has organised a number of national and international seminars and congresses in Morocco. It also participates in international conferences. In 2009 it had 120 members, including service providers, contractors, consulting firms and professional associations.

## **2.3 WATER SCARCITY AT ISLANDS**

### **2.3.1 Caribbean water supplies severely threatened by climate change**

Jason Johnson, vice president of the Caribbean Water and Wastewater Association, a Trinidad-based non-profit group, said:

Many Caribbean nations rely exclusively on underground water for their needs, a vulnerable source that would be hit hard by climate change effects. That's the greatest concern. Those weather patterns may change, and there may not necessarily be the means for those water supplies to be replenished at the pace that they have historically been replenished.

Parts of the Caribbean have been experiencing an unusually dry spell that emerged last year. In August 2012, some islands reported extremely dry weather, including Grenada and Anguilla. By July of this year, those conditions had spread to Trinidad, Antigua, St. Vincent and Barbados, according to the Caribbean Institute for Meteorology & Hydrology (Sinking Islands, 2014).

Bernard Ettinoffe, president of the Caribbean Water and Sewerage Association Inc., a St. Lucia-based group that represents water utilities in the region, stated:

Intense rains have been reported in recent months in some Caribbean areas, but that doesn't mean an increase in fresh water supply. Heavy rains mean there's not enough time for water to soak into the ground as it quickly runs off. In addition, the cost of water treatment increases, and instead many islands shut their systems to prevent contamination.

The island considered most at risk is Barbados, which ranks 21st out of 168 countries in terms of water demand exceeding available surface water supplies, according to a 2012 study by British risk analysis firm Maplecroft. Other Caribbean islands high on the list are Cuba and the Dominican Republic, which ranked 45 and 48, respectively. The study did not provide data on a smattering of eastern Caribbean islands that officials say are among the driest in the region.

"There are a number of indications that the total amount of rainfall in much of the Caribbean would be decreasing by the end of the century," said Cedric Van Meerbeeck, a climatologist with the Caribbean Institute for Meteorology & Hydrology. Van Meerbeeck said water supplies would continue to decrease if individuals as well as agriculture and tourism, the region's key industries, did not monitor use.

Van Meerbeeck stated that "climate is maybe not the biggest factor, but it's a drop in an already full bucket of water. "It will have quite dramatic consequences if we keep using water the way we do right now".

Jamaica, Trinidad and Barbados have ordered rationing this year, with Barbados reducing pressure and occasionally cutting off supply to some areas. The island also began to recycle water, with officials collecting treated wastewater to operate airport toilets. Overuse of wells elsewhere has caused saltwater seepage and a deterioration of potable water underground, leading to the construction of hundreds of desalination plants in the Caribbean.

According to John Thompson, director of the Caribbean Desalination Association board, the cost of desalination still remained unaffordable for many governments.

The biggest challenge overall was changing the mentality of water utility authorities who see their role as solely providing clean water.

### **2.3.2 Carteret Islands – The challenge of relocating entire islands**

The Carteret Islands became uninhabitable due to the rise in sea level. A local grassroots movement organises the relocation of the entire island group. Land and financial resources must be acquired and good relations are prepared with host communities. Despite large media coverage about the faith of Carteret Islanders, little external help was received to assist relocation plans (Campbell, 2012:57-59).

#### **Why the Carteret Islands need to be relocated**

The Carteret Islands are a group of small low-lying atolls 86 km northeast of Bougainville in Papua New Guinea. They are only about 1 m above sea level. Lying in a tectonically unstable region, Carteret is subsiding steadily. Storms caused erosion of land and saltwater intrusion in the soil so that the islanders were unable to feed themselves. Boats with food came two or three times a year. But in the long term, it will not be possible for people to survive only by external aid.

### **2.3.3 Understanding Climate Change and El Niño**

Pacific weather conditions are dominated by El Niño Southern Oscillation (ENSO). But what is this climate phenomenon exactly and does it get altered with climate change?

#### **What is El Niño?**

The ENSO cycle is natural climate variability in the Pacific region with cycles of about two to six years. During natural ENSO oscillations the sea level fluctuates by about 20 cm and causes large seasonal variations of precipitation patterns with long wet and dry periods between several years. In El Niño periods the Central and Eastern Pacific Ocean is warmer than average. More cyclones are occurring. In La

Niña periods the Central and Eastern Pacific Ocean is colder than average. ENSO La Niña periods promote rather drought conditions in the South Pacific (Klein, 2014).

### **Water scarcity in La Niña periods**

In La Niña periods many islands experience water shortages. Islands are no longer able to meet the citizens' needs for drinking water. Water scarcity is a vital problem for many Pacific island states. It is defined as lack of sufficient access to safe and affordable water for drinking, washing and livelihood. Since Pacific islands are poorly gifted with surface water and groundwater is too brackish to drink, many countries dependent on rainwater as primary water source. This makes the islands very vulnerable to variations of precipitation patterns (Klein, 2014).

### **How climate change affects ENSO**

Climate change model projections show that ENSO events are becoming more intense and extreme with longer periods of drought and more frequent tropical cyclones. But model projections about rainfall pattern are inconsistent. Some preview an increase in rainfall, others predict reduced amounts of rainfall (Pacific Climate Change Science Program 2011, Power 2012). Though measurements do not show a significant trend for extreme weather events, the IPCC stated that it is very likely that small islands to the east of the dateline experience more frequent and intense and divesting tropical storms during El Niño events (Mimura & Griffiths, 2007).

### **Climate change: Remote islands are struggling**

Pacific islands are characterised by their remoteness. This has a massive influence on the economic development of islands and their capacity to adapt to climate change. Only a few shipping lines connect the dispersed islands with the world and bring merchandise, resources and experts to the islands. Imports and exports and the repairing of damage after disasters are thus extremely expensive.

## **Water shortage in paradise**

Surrounded by sparkling blue sea, many Pacific islands are faced with the risk that freshwater scarcity could turn their islands uninhabitable. Tuvalu declared a state of emergency in 2011 due to water scarcity. During six months it did not rain on the remote atolls. Approximately 1,500 people of the 11,000 inhabitants ran out of fresh water (BBC, 2011; International Federation of Red Cross and Red Crescent Societies, 2011).

## **Why is there water scarcity on Pacific islands?**

One reason for the water crisis is climate change. Nations like Tuvalu are tiny atoll islands with thin freshwater lenses and no rivers or lakes. The warming trend leads to higher evaporation rates, so that more precipitation is required to replenish the freshwater lens. As the sea level rises, more seawater pushes against the freshwater lens of atolls, so that groundwater gets too salty to drink.

Since groundwater is not potable, rainfall collected by roof catchments is often the primary source of freshwater. This makes people very vulnerable to droughts. The region is characterised by dry and wet seasons and strong variation of precipitation patterns due to the El Niño Southern Oscillation (ENSO). Every two to six years La Niña periods with drought conditions occur. With climate change, ENSO events become more intense with longer periods of drought. But during the drought crisis of Tuvalu in 2011, precipitation patterns lay in the range of normal variations (Pacific Climate Change Science Program, 2011). Why was Tuvalu no longer able to meet the citizens' needs for water?

## **Other driving forces for water stress**

The driving force for water scarcity is not only the lack of resources, it is also a question of an increased water demand. The domestic use of water grew due to new lifestyles, cars, washing machines, and imported food. Households got equipped with flush toilets, which increased the water demand by 25-40 % (GEF Pacific IMRW, 2012).

Problems were exacerbated by a high population density. With 333.3 people per km<sup>2</sup> Tuvalu has today one of the highest population density in the world (FAO, 2012). The rapid population growth led to fast urbanization with quickly constructed insufficient water infrastructure. Rain tanks are often leaking. The growing number of family members compromises the water security in drought periods, because water tanks were constructed to cater for a smaller number of family members. Many people have no paid work, so that they cannot afford to buy new water tanks. For households without income, even low fees for water from public cisterns can be too much.

Poor families use the salty groundwater as emergency water source in periods of drought. But nowadays, groundwater is often contaminated by heavy metals from waste dumps and by faecal bacteria from leaking septic tanks. Health authorities on Tuvalu strongly recommend not to drink well water. But in drought periods poor people and islanders far from public cisterns have no choice. Therefore, waterborne and water-related diseases like diarrhoea and cholera are likely to occur.

### **How to cope with the problem of water scarcity**

Disaster risk reduction measures are cheaper than emergency relief. The increase of water storage capacities and sustainable use of local water resources are a high priority for Pacific island nations. Water catchments are improved, communities get equipped with desalination units and dry composting toilets are installed. Educational videos like “Falevatia: A toilet for our future” highlight the benefits of these low-tech solutions: (Klein, 2014).

Public awareness campaigns seek to improve knowledge about water resource management. Since national TV channels do not exist, the radio is the best way to reach people on remote islands. Weather forecasts get improved because in situations of drought they give time for emergency adaption.

Water scarcity could also compromise the food security of islands. Pulaka (*Cyrtosperma chamissonis*) is the main staple of the traditional diet of Pacific islanders. It has a low capacity to tolerate saltwater. Crops die due to saline water contamination, so that the cultivation of salt resistant crops is now promoted.

## **Outlook to the future: Is it too late for domestic adaption?**

Regional governments are aware of the limits of adaption. A growing population competes for the allocation of water resources. It is not certain that islands can cope with less stable precipitation patterns in the future. The IPCC stated in the Forth Assessment Report that it is very likely that low-lying island states are getting entirely uninhabitable long before their full submersion due to the lack of water (Mimura *et al.* 2007).

### **2.4 THE EXPERIENCES OF BOTSWANA**

Botswana is likely to be one of the first countries to face water shortages in the world, The World Economic Forum 2012 has predicted (Africa Review n.d.:1).

Water, food and energy have been identified as some of the world's greatest threats alongside global market upheavals and corruption and drug trafficking.

According to the report, the Botswana Daily News a global water shortage is looming with Botswana likely to be among the first nations to experience the crisis.

“With no perennial rivers under its full control, a drought-prone environment, and dam evaporation rates accelerating with global warming, Botswana has perilously few water resources to meet ordinary demand and support economic growth.”

In February this year, Botswana's Water Utilities Corporation acquired some emergency funds to the tune of about \$40 million to address the supply challenges in its most affected operational areas.

The parastatal admitted to experiencing water shortages due to inadequate supply and the decreased yields of some boreholes.

The southern African region is poorly endowed with water resources, as characterised by erratic rainfall and frequent severe drought conditions, coupled with unfavourable topography in terms of source development and utilisation, the provision of affordable water remains a major challenge.

## 2.5 THE EXPERIENCES OF THE SEYCHELLES

Drinking water in the Seychelles, currently threatened by irregular rainfall and longer dry periods, will be secured through an investment programme backed by EUR 27 million European Investment Bank funding. Planned upgrades to the island's water network will also protect water cleanliness with new sewer facilities and measures to reduce water loss (European Commission Press Release, 2012).

The Seychelles is suffering from water scarcity due to the concentration of rainfall in a short period within each year, its variability across different years, little groundwater availability and limited opportunities to expand storage capacity necessary to transfer water resources from the wet to the dry season. Therefore, the water supply system is highly vulnerable to meteorological conditions, which may be aggravated by greater rainfall variability linked with global climate variations. The underinvestment in water supply infrastructure has generated a decline in water service quality and in the efficiency of their provision, with high water losses and energy consumption. Sewage collection and treatment facilities are also very limited, posing a high threat to both public health and the environment.

The Seychelles water and sanitation programme will help the Seychelles Public Utilities Corporation to alleviate water shortages through renewal and expansion of water supply on the 3 main islands to reduce water loss, improve energy efficiency and increase resilience of water supply to an increasingly uncertain climate and less predictable rainfall patterns. Upgrading existing sewage facilities on Mahé and construction of new sanitation infrastructure on La Digue will reduce the risk of the contamination of groundwater used for drinking water. The scheme will also contribute to improving environmental and natural disaster risk management, and overall water management.

Alessandro Mariani, Ambassador, Head of the EU Delegation to the Seychelles stated that "addressing the drinking water supply situation is of great importance for the population of the Seychelles, as well as for sustaining its economy which is in a very good recovery phase". He also took the opportunity to emphasise the exemplary relations between the Seychelles and the European Union by saying that "they are excellent. The quality of the dialogue between the EU and its Member

States, on the one hand, and the Government of Seychelles is the key for such good relations and results".

## **2.6 THE EXPERIENCES OF THE UNITED ARAB EMIRATES**

The United Arab Emirates is extremely water scarce and cannot support a domestic agricultural sector capable of feeding its population (Future Direction International, 2013).

The country's energy resources and financial wealth enable it to comfortably meet its food and water needs through desalination and trade.

Long-term food and water security and agricultural self-sufficiency are key strategic goals for the UAE government. Critical dependency on desalination and food imports exposes the country to risks from global food price spikes and shortages, and geopolitical and environmental threats.

The UAE has one of the world's most comprehensive plans to support food and water security, but much can be done to improve its sustainability.

The UAE's strategy to develop its position as a regional hub for agri-food trade will support efforts to bolster regional food security.

Opportunities exist for Australia and the UAE to collaborate to improve the UAE's food security and boost Australia's agricultural sector.

The UAE is one of the world's most water-scarce nations and faces a crippling shortage of renewable fresh water. Dubai, its most populous city with more than two million people, relies on desalination plants for 98.8 per cent of its water supply. Without an adequate renewable water supply, the UAE is unable to grow the food needed to feed its population.

Despite the extreme scarcity of water and agricultural resources, the UAE is by many measures comfortably food secure. The country was ranked 30th in the world on the Economist's recent Global Food Security Index. The UAE's oil and gas wealth enable it to comfortably maintain an affordable and accessible food supply through international trade.

The country's reliance on artificial water sources and imported foods, however, makes it vulnerable to crises and undermines its long-term food security. For this reason, the UAE has developed one of the world's most comprehensive food and water security strategies. It recognises that "water is a strategic commodity on par with oil – maybe even more important" and that "without water security, there can be no food security".

## **Analysis**

### **Demand**

The UAE's current population of 9.34 million people is projected to reach close to 11.5 million people by 2025 (United Nations, 2012). This will place increased pressure on the country's already strained food and water resources. Food consumption is currently growing at 12 per cent each year and it is predicted that the value of food imports will increase from US\$3 billion in 2011 to US\$8.4 billion by 2020 to meet this demand. Significant issues with food waste and over-consumption further increase the UAE's food demand. The UAE has one of the world's highest rates of obesity, in part due to the shift towards a globalised diet that began following the discovery of the country's oil wealth. The demand for processed, western foods increases the UAE's reliance on food imports.

Over-consumption is also a problem in the water sector. The UAE is the world's third largest consumer of water, despite its arid climate and lack of renewable water sources. Consumers in the UAE use around 400 litres of water each day, compared to a global average of 250 litres. The UAE relies on its expensive desalination plants to meet this water demand.

### **Supply**

#### **Water supply**

The United Nations defines a country as 'water scarce' if it has 1000 cubic metres of water or less available per capita, per year. The UAE's natural water supply is less than half this level, making it one of the world's most water-scarce nations.

Most of the groundwater in the UAE is found in fossil aquifers that receive little to no water recharge. For every litre of water that flows back into the country's

groundwater reserves from infrequent rainfall, twenty-five litres is withdrawn. This rate of extraction is leading to severe degradation of the remaining water supplies. Renewable water resources have decreased by 42 per cent since 2000 and further declines are expected in the near future. Acute water shortages are expected in the region by 2025.

To meet the skyrocketing water demands of its population, more than 25 desalination plants supply as much as 80 per cent of the UAE's total water supply. While critical to the viability of the state, however, desalination is a costly and energy-intensive process. It is estimated that by 2030, even with improvements in technology, desalination will consume at least 20 per-cent of the UAE's overall energy production.

### **Food supply**

More than 70 per-cent of all water used in the UAE goes into irrigation for agriculture. Even with ambitious plans to cut agricultural water use in half by the end of 2014, expanding domestic production is difficult due to the lack of available water supplies.

Only 6.5 per cent of the UAE's land is suitable for farming and it is difficult to produce economically viable crops in conditions of extreme heat, low rainfall and barren desert soil. Despite being the country's major consumer of water, the agricultural sector contributes only 3 per cent of the country's GDP and employs only 3 per cent of the labour force. The UAE's major crop is dates, along with tomatoes, cucumber and eggplant. The country is close to self-sufficient in fruit and vegetable production. It also produces enough eggs, poultry, fish and dairy products to meet its needs. This production does not meet the dietary needs of the population, however. The UAE relies on imports for its grain, meat, sugar and edible oil needs. Food imports amount to between 85 and 90 per cent of food consumption each year. Its main food sources are India, the United States and Brazil.

There are three aspects to food security: the availability, affordability and accessibility of food. Limitations on agricultural production mean that the UAE's biggest challenge is availability. The country simply cannot produce the quantity of food it needs to feed its population. Food security, however, does not rely solely on the ability to produce food domestically. A strong oil and natural gas industry and

high levels of national and per capita income mean that the UAE can comfortably afford to maintain trade-based food security.

### **Food and water security risks**

Although the UAE has extensive desalination infrastructure and the finances to ensure access to affordable food supplies, its heavy reliance on artificial water and external food sources exposes it to risks arising from volatility in the global food market, geopolitical instability, and environmental threats.

#### **Market volatility**

The global food price crisis was the catalyst that caused Middle Eastern countries to start thinking seriously about their long-term food and water security strategies.

In 2008, rising food demand from emerging economies and crop decimation caused by natural disasters in grain-exporting regions led to diminished grain availability globally. As supply contracted, prices rose. The world food price index increased by 45 per cent during 2008. The price of wheat – one of the UAE's major food imports – increased 130 per cent. Major food producing countries imposed export bans to protect their domestic prices.

The UAE is highly exposed to volatility in world food markets due to its heavy import reliance. As global prices rose and sellers left the market, the UAE's strategic food reserves fell to only 10 days' supply and domestic food prices rose. In neighbouring countries, rising food prices triggered riots in the streets. These incidents demonstrate the potential vulnerability within the UAE to food and water shortages in times of crisis.

#### **Geopolitical risk**

Geopolitical threats in the Middle East exacerbate the risk created by critical dependency on imported food and artificial water supplies. A secure supply of food and water is essential to the smooth functioning and stability of the UAE. Should simmering regional conflicts escalate, some of the UAE's critical trade links could be jeopardised, complicating food accessibility.

## **Environmental threats**

The UAE's desalination capacity is vulnerable to external threats. Four oil spills seriously impacted production between 1994 and 2001, as did red tide algal blooms in 2007 and 2008. If leaks were to occur from Iran's Bushehr nuclear plant this could also contaminate the water fed into the desalination plants (Future Directions International, 2013).

The UAE's domestic agricultural production faces threats from land degradation, sand invasion and recurrent drought. The environmental threats will be exacerbated by climate change. Rising temperatures in the region, which already experiences extreme heat, will damage the UAE's vegetable and fruit crops. Less rainfall could lead to lower organic matter content in soils and ultimately, lower productivity. These issues will also arise in many of the countries the UAE imports its food from.

## **2.7 CONCLUSION**

Chapter two consisted of the literature review. The literature review was structured thus: water scarcity in desert areas; water scarcity at islands; the experiences of Botswana; the experiences of the Seychelles; and the experiences of the United Arab Emirates.

The water scarcity factor is a serious concern not only in South Africa but other countries as well. Water as a scarce resource should be protected, because the lives of many families and children depend on it.

Chapter three will discuss the following: international policies around water; South African policies around water; national laws and strategies; dealing with water loss due to alien plant invasion; dealing with the illegal use of water by commercial farmers; cooperation with neighbouring countries; local government and strategies; and save water campaigns.

# **CHAPTER 3: SOUTH AFRICAN LEGISLATION AND INTERNATIONAL POLICIES AROUND WATER USAGE**

## **3.1 INTRODUCTION**

Chapter two gave an introduction to the study. The experiences of specific places with regard to water scarcity over the world were dealt with and outlined to make the case for this study. Chapter three will consist of the international policies around water; South African policies around water; national laws and strategies; dealing with water loss due to alien plant invasion; dealing with the illegal use of water by commercial farmers; cooperation with neighbouring countries; local government and strategies and the save water campaign.

The water scarcity factor is a serious concern not only in South Africa but other countries as well. Water as a scarce resource should be protected, because the lives of many families and children depend on it.

## **3.2 INTERNATIONAL POLICIES AROUND WATER**

The right to water to satisfy basic human needs for personal and domestic use is protected under international human rights law. When incorporated in national legal frameworks, this right is articulated to other water rights within the broader body of water law. The human right to water is recognised in international law through a wide range of international documents, including international human rights treaties, declarations and other standards (de Chezournes, 2013:198).

The human right to water places the main responsibilities upon governments to ensure that people can enjoy "sufficient, safe, accessible and affordable water, without discrimination". Most especially, governments are expected to take reasonable steps to avoid a contaminated water supply and to ensure there are no water access distinctions amongst citizens. Today all States have at least ratified one human rights convention which explicitly or implicitly recognises the right, and

they all have signed at least one political declaration recognising this right (Posner, 2014:78).

### **3.3 SOUTH AFRICAN POLICIES AROUND WATER**

Local government in South Africa has been shaped and guided by the following pieces of legislation since 1994.

#### **3.3.1 National laws and strategies**

➤ **The South African Constitution of 1996 (Act No. 108 of 1996)**

The Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996), was approved by the Constitutional Court (CC) on 4 December 1996 and took effect on 4 February 1997.

The Constitution is the supreme law of the land. No other law or government action can supersede the provisions of the Constitution. South Africa's Constitution is one of the most progressive in the world and enjoys high acclaim internationally.

The principles of co-operative governance are set out in the Constitution and the roles and responsibilities of the three spheres of government are defined. According to the Constitution, the responsibility for water resource management functions is to be devoted to the lowest possible sphere of government. Local government is therefore assigned the responsibility for providing water and sanitation services to the people living within its jurisdiction. Provincial government has the exclusive responsibility to ensure that local government carries out these responsibilities effectively. The Constitution of the Republic of South Africa mandates local government to:

- a. Provide democratic and accountable government for local communities;

- b. Ensure the provision of services to communities in a sustainable fashion;
- c. Promote social and economic development;
- d. Promote safe and healthy development;
- e. Encourage the involvement of communities and community organisations in the matters of local government; and
- f. Put structures in place for administration, budgeting and planning processes to give priority to the basic needs of communities.

➤ **National Water Act of 1998 (Act No. 36 of 1998)**

The National Water Act, 1998 (Act No. 36 of 1998), ensures that South Africa's water resources are protected, used, developed, conserved, managed and controlled in a sustainable and equitable manner, for the benefit of all people.

The purpose of this Act is to ensure that the nation's water resources are protected, used, developed, conserved, managed and controlled in ways which take into account, amongst others, the following:

- a) Meeting the basic human needs of present and future generations;
- b) Promoting equitable access to water;
- c) Redressing the results of past racial and gender discrimination;
- d) Promoting the efficient, sustainable and beneficial use of water in the public interest;
- e) Facilitating social and economic development;
- f) Providing for growing demand for water use;

- g) Protecting aquatic and associated ecosystems and their biological diversity;
- h) Reducing and preventing pollution and degradation of water resources;
- e) Meeting international obligations; and
- j) Promoting dam safety;

A national water resource strategy will provide the framework within which water will be managed at regional or catchment level, in defined water management areas.

This will be done through the creation of a comprehensive national water resource strategy which provides for:

- a. International rights and obligations;
- b. Actions to be taken to meet projected future water needs;
- c. Water use of strategic importance;
- d. Estimates of present and future water requirements; and
- e. Principles relating to water conservation and water demand management.

➤ **Water Services Act of 1997 (Act No. 108 of 1997)**

The Act provides for the rights of access to basic water supply and basic sanitation. Sufficient water and an environment not harmful to health or well-being are necessary. Government has to ensure that water supply services and sanitation services are provided in a manner that is efficient, equitable and sustainable. The provision of water supply services and sanitation services, although an activity distinct from the overall management of water

resources, must be undertaken in a manner consistent with the broader goals of water resource management.

This Act, among other things, also provides for the gathering and the distribution of information in a national information system and the promotion of effective water resource management and conservation.

The interests of consumers and the broader goals of public policy must be promoted. The National Government plays the role of custodian of the nation's water resources.

➤ **National Water Resource Strategies (NWRS)**

In July 2013, the Minister of Water and Environmental Affairs released the second National Water Resource Strategy (NWRS2), which sets out the vision and strategic actions for effective water management (South African Government, n.d.:3).

These included the security of water supply, environmental degradation, and pollution of resources.

The NWRS2 outlines the key challenges, constraints and opportunities in water resource management and proposes new approaches that ensure a collective and adequate response for the benefit of all people in South Africa.

This strategy seeks to propel towards the achievement and attainment of an inclusive sustainable and equitable economy.

The NWRS2 seeks to ensure that the management of national water resources contributes towards achieving South Africa's growth, development and socio-economic priorities in an equitable and sustainable manner over the next five to ten years.

The strategy also responds to the priorities set by government in the National Development Plan (NDP) and National Water Act imperatives that support sustainable development. It is centred on three key objectives:

- a. Water supports development and the elimination of poverty and inequality. The strategy recognises that the manner in which water was allocated in the past was unequal and favoured certain

sections of the population. The intention, therefore, is to redress past imbalances in the manner in which water was allocated.

- b. Water contributes to the economy and job creation.
- c. Water is protected, used, developed, conserved, managed and controlled in a sustainable and equitable manner.

The NWRS2 also focuses on water conservation and the management of water demand as key priorities.

➤ **Groundwater strategy**

Groundwater is a strategic resource in many parts of South Africa, especially in rural areas. It also plays an important role in the supply of water to small towns and villages in the drier parts of the country.

There is considerable potential for additional development of groundwater resources to augment existing resources.

The need for improved groundwater management to ensure sustainable and efficient use of the resource was recognised in NWRS-1 and led to the formulation of a National Groundwater Strategy through which strategic actions are undertaken.

➤ **Reuse strategy**

The department has developed a water reuse strategy to encourage informed decisions relating to water reuse.

Reuse could be significantly increased with the reuse of return flows in coastal cities, where it would otherwise drain into the sea.

In coastal cities, water reuse and desalination compete as two options for water conservation.

Reuse is becoming increasingly acceptable and feasible owing to increasing shortages, improved purification technology and decreasing treatment costs.

Membrane technologies, also used for the desalination of seawater, have become more affordable and have improved.

The reuse of treated waste water will have to be managed carefully to ensure public health safety.

➤ **Rainwater harvesting strategy**

The department supports a national rainwater harvesting programme, which has a narrow but important focus on the construction of above and below-ground rainwater storage tanks by rural households for food gardens and other productive water uses.

Several municipalities now use roof rainwater tanks for domestic purposes. These have been found to be particularly effective when used in conjunction with other water supply options.

Though there are no hard figures yet on how many cubic millimetres per year rainwater harvesting can contribute, it is an option that can be implemented in a short timeframe.

➤ **Desalination strategy**

The department has developed a supporting desalination strategy, which also includes desalination as a technology for treating water other than seawater for water reuse. The desalination of seawater could potentially provide an unlimited resource of fresh water.

It has become more attractive since the NWRS-1 because of improved technologies, decreasing costs and increasing water scarcity.

However, the rising cost of energy may be a deterrent.

Like other infrastructure projects with potentially environmental impacts, the planning for a desalination plant will have to undergo an environmental impact assessment in compliance with the National Environmental Management Authority (Nema) of 1998.

The department will ensure that desalination is considered as an option for meeting future water requirements, in particular in coastal cities where there is sufficient electricity for desalination.

The target is not only to implement desalination in several locations in South Africa, but also to become an international knowledge centre in this particular field.

### **3.3.1.1 Dealing with water loss due to alien plant invasion**

Invasive alien plants are plants which are imported into an eco-system which is not their natural habitat. They proceed to grow prolifically, threatening the indigenous plant and animal species. They tend to utilise more resources to grow, in particular water. This can seriously deplete soil moisture and reduce groundwater recharge, the base-flow of springs and ultimately the flow in rivers and streams. In catchment areas which are infested with such plants, the eradication of invasive alien plants can often lead to significant increases in water available for other uses and may offer an alternative to traditional engineering solutions such as the construction of reservoirs and dams.

Invasive aliens include a variety of plants from aquatic weeds such as Water Hyacinth to large trees such as Eucalyptus and Wattle. Such plants in their own native eco-systems are constrained and of no harm but, when introduced into foreign habitats, can cause enormous damage.

Billions of Dollars are lost every year in many countries due to damage done by invading alien plants. They are the single biggest threat to plant and animal biodiversity. As an example, there are 161 introduced tree and other plant species that have become invasive in a single country - South Africa. If uncontrolled, the problems are likely to double within 15 years (Invasive Alien Plant, n. d).

Alien invasive plants are a problem because they:

- a. Can waste a large proportion of national water resources (7% estimated in South Africa);

- b. Lead to the loss of potentially productive land, and the loss of grazing potential and livestock production;
- c. Reduce the ability to harvest indigenous natural resources;
- d. Increase the problems associated with flooding and fires;
- e. Cause erosion, destruction of rivers, siltation of dams and estuaries, and poor water quality; and
- f. Can cause a mass extinction of indigenous plants and animals.

(Invasive Alien Plant, n. d).

**Programmes to eradicate invasive alien plant species can have a number of benefits:**

- a. Increased water security with enhanced stream flow and improved water quality;
- b. More productive wetlands, estuaries and water tables;
- c. Rehabilitation of degraded land with a strong emphasis on land care to secure the sustainable productivity of land;
- d. Conservation of biodiversity and catchment integrity and the reduction in the frequency and intensity of fires and floods;
- e. Development of secondary industries based on the cleared wood; and
- f. Empowerment of people through the labour-intensive approach to the work (The Working for Water programme in South Africa has employed over 42 000 people in a five year period.) (Invasive Alien Plant, n. d).

### **3.3.1.2 Dealing with the illegal use of water by commercial farmers**

Grain SA warns farmers against illegal water use.

Farmer body Grain South Africa (GSA) warned farmers against the illegal use of water in terms of the National Water Act, 1998 (Act No. 36 of 1998). The Department of Water Affairs and Forestry has estimated that up to 70% of water use along the mid and lower Vaal River system is illegal.

GSA chairperson Bully Botma stated:

“Approximately 60% of total water use in South Africa can be attributed to the commercial agricultural sector that utilises this water for irrigation purposes. In a country poor in water resources, this places a considerable responsibility on all in the agricultural sector to operate within the National Water Act,”

Over the past few years, irrigation schemes have sprung up across the country often without the necessary water rights being granted or without an environmental impact assessment being conducted, as is prescribed by law.

Besides the fact that such actions are transgressions of the National Water Act, and duly punishable with stiff fines, they directly infringe on the rights of law-abiding water users. (Baleta & Pegram, 2014:15).

The SA Local Government Association (SALGA) said the replacement value of water and sanitation infrastructure stood at R44 billion as of 2011. From a municipal perspective, vandalism and theft happened throughout the country. In rural areas, because the infrastructure was in close proximity, the chances of vandalism were high. In an urban context, the crime was more organised as an ordinary citizen could not access the infrastructure easily. Root causes of the problem included the inability of politicians to deliver on promises, which gave rise to protests, the fact there was a market for goods like cables and valves, and related to this were business opportunities, such as water carting -- vandalised infrastructure was good for some businesses. Some of the forms of theft and vandalism included illegal connections, in response to frustration at the level of services.

**Some initiatives which municipalities could institute to eliminate theft and vandalism include:**

- a. Collaborating with law enforcement agencies;
- b. Installing CCTVs;
- c. Concrete manholes which could not be stolen;
- d. The delegation of powers to municipal law enforcement agencies;
- e. Robust community engagement;
- f. Naming and shaming;
- g. Working with scrap metal buyers; and
- h. Conducting research and measurement of theft and vandalism.

Illegal water connections not only result in unnecessary loss of water and costs to the municipality but are a violation to other residents' right to access clean water.

It is for this reason that the municipality must take a tough stance against customers continuing to use water illegally.

**3.3.1.3 Cooperation with neighbouring countries**

South Africa has signed cooperative agreements with a number of countries in the southern African region with which it shares water resources, such as:

- Mozambique and Swaziland on the Inkomati and Maputo rivers;
- Botswana, Lesotho and Namibia on the establishment of the Orange Senqu River Commission;
- Botswana, Zimbabwe and Mozambique on the establishment of the Limpopo Watercourse Commission;

- Lesotho on the Lesotho Highlands Water Project; and
- Swaziland on the Komati River Development Project.

These agreements improve South Africa's bilateral and multilateral relations in the African Union. All the countries involved benefit, while sharing development costs.

South Africa shares four of its major river systems with six immediate neighbouring countries, namely Botswana, Lesotho, Mozambique, Namibia, Swaziland and Zimbabwe.

In the area of shared river basins, South Africa continued participating in joint water commissions to form part of Africa Bilateral with Botswana on Joint Permanent Cooperation and with Mozambique regarding the breach of the Usuthu River, where a feasibility study was completed (South African Yearbook, 2013/14:445).

### **3.3.2 Local government and strategies**

Various policies exist pertaining to local municipalities on the provision of basic services such as water supply and the management thereof. To ensure good governance, these policies need to be adhered to by all relevant stakeholders. Non-compliance with these policies may lead to a municipality not living up to social expectations on service delivery, in this case water service delivery in the Umnambithi local municipality. This local municipality has a governing duty; it must comply with constitutional rights as well as all relevant policy frameworks to enhance local governance and sustainable development in water service delivery.

#### **Overview of the legal framework for Local Government (LG)**

The powers and functions of the spheres of government are enshrined in the Constitution. In pursuit of the constitutional structure which was formulated in 1998, with the subsequent promulgation of a suite of local government legislation within a financial framework afforded by the annual Division of Revenue Act.

The division of such powers and functions is developed upon in the Municipal Structures Act, 1998 (Act No. 117 of 1998), mandate of a developmental local government, the White Paper on Local Government, the Municipal Systems Act, 2000 (Act No. 32 of 2000) and the subsequent Amendment Act, 2000 (Act No. 33 of 2000), particularly in respect of local government spheres (local and district municipalities). This suite of legislation further includes the Intergovernmental Relations Framework Act, 2005 (Act No. 13 of 2005), the Municipal Demarcation Act, 1998 (Act No. 27 of 1998), Local Government Finance Management Act, 2003 (Act No. 56 of 2003), Local Government Property Rates Act, 2004 (Act No. 6 of 2004) and the Disaster Management Act, 2002 (Act No. 57 of 2002).

The Development Facilitation Act, 1995 (Act No. 67 of 1995) states that an integrated development plan (IDP) must be prepared to ensure proper co-ordination and integration of development. IDPs are the most important mechanisms available to government to transform structural differences in South Africa's previously divided society. The IDP process is also one of the primary means of developing a community through the promotion of public participation in its analyses and planning phases (Geyer, 2006:7). This process, a legal requirement of LG, prepares officials and politicians for the requirement of integrated planning and management (Act No. 32 of 2000; Act No. 36 of 1998). However, as the IDP is presently set out in the Municipal Systems Act, 2000 (Act No. 32 of 2000), it is not required that water availability and demand be considered during all parts of development planning, and neither does the IDP process demand a discussion of how development will impact natural resources. In addition, the IDP deals separately with those services that impact water resources, such as solid waste management, storm water management, and water service and sanitation. This is not conducive to IWRM.

Given the cross-sectoral nature of water, all legislation has at least some application to water resources and service management. The National Environmental Management Act, 1998 (Act No. 107 of 1998) and the National Water Act direct the components of the municipal IDP, reviewed annually. The Integrated Waste Management Plan and the WSDP are subsets of the IDP. At present there is no statute that prescribes the duties of LG in terms of IWRM.

As Water Services Authorities, municipalities are ultimately accountable for the delivery of water services and sanitation to consumers, whether or not they fulfil the provider function. Four tasks are identified for the Water Services Authority (WSA). They need to:

- Adapt internal arrangements and put governance mechanisms in place to effectively regulate water services by developing and implementing policies such as by-laws and regulating competence.
- Take on the cost-effective and sustainable management and operation of water services infrastructure through determining tariffs, managing equitable share allocation, service level planning, capital infrastructure investment prioritisation and implementation.
- Make appropriate arrangements for the sustainable, efficient and effective provision of water services across their areas of jurisdiction through a Water Services Provider under contract or by themselves (Municipal Systems Act, 2000 (Act No. 32 of 2000, and section 78). The provider function relates to practical implementation including day-to-day operations. Apart from providing safe potable water, water services include providing sanitation, treating wastewater and effluent, effecting repairs together with preventative and major maintenance as well as revenue collection and related financial management. In addition, provider functions extend to customer relations and communication, including information on the service being delivered as well as health and hygiene awareness. Related and linked services that are the responsibility of LG include managing solid wastewater and storm water in ways that ensure a healthy environment.
- Draft and adopt a WSDP every 5 years, with annual review, as part of its IDP. This is the principal legal responsibility of LG under Act 108 of 1997 (sections 12-15). The WSDP encapsulates all the responsibilities and tasks required of local government in water services delivery and force a WSA to consider each aspect.

### **3.3.2.1 Save water campaigns**

#### **Education and awareness**

Each municipality has a different campaign in their communities such as ‘water wise’ for the Rand Water environmental brand.

The National Water Week is an awareness week campaign by the Department of Water Affairs which serves as a powerful campaign mechanism re-iterating the value of water, the need for sustainable management of this scarce resource and the role water plays in eradicating poverty and under-development in South Africa.

The campaign seeks to continue building on the on-going awareness creation within the broader South African community. This awareness creation is coupled with the responsibility that every citizen must take in ensuring the integrity of our water resources and their efficient use. In particular, the linkages between water services, supply, and resource management; and poverty eradication, social and economic development are emphasised in a number of innovative ways. The campaign has been influenced by local needs and international sectoral trends.

In 2013, Water Week was observed from 18 to 24 March under the theme Water is Life – Respect It, Conserve It, and Enjoy It.

As custodians of this awareness week, the Department of Water Affairs is encouraging all South Africans to focus on the need to restore and preserve the integrity of this most precious resource, water. South Africans must take responsibility to make sure this scarce resource is managed in an effective and sustainable manner (South African Government n.d.:22).

### **3.4 CONCLUSION**

The Acts and Policies mentioned above are meant to set parameters within which water provision must be governed and regulated. In addition, they provide a framework within which the local councils can provide affordable, efficient,

economical and sustainable access to water supply and sanitation. Furthermore, the emphasis is placed on the principle of good management, but the discretion on how they will be implemented rests on the shoulders of local municipalities. Compliance with and implementation of various policies will ensure that a municipality attains its social and economic targets in order to protect the scarce resource (that is: water) and the environment so that it can be enjoyed by all citizens who live in it.

# **CHAPTER 4: FIELDWORK AND EMPIRICAL DATA COLLECTION PROCEDURE**

## **4.1 INTRODUCTION**

The research enquiry investigated the effectiveness of local government in water usage in Ezakheni Township and how the community perceive the effectiveness of their local government. However, other aspects were also examined, such as the responsiveness of local government in tackling leakages in the society, creating awareness about water conservation, development of training programmes for the unemployed youth and the community's perception about water scarcity in general. In addition, the means of using water effectively and efficiently.

South Africa is at a point where, after the complete revision of its water and sanitation policies that accompanied democratic transformation, attention has turned to implementation. The new policies and associated legislation are not only about ensuring adequate quality and quantity of water for human needs, they are also about protecting the scarce resource for current and future use.

The focal point to achieving efficient and effective water supply in sustainable manner is through improved water governance and integrated development. This chapter will look at the core issues of water supply, water resources management, and water and sanitation backlogs in Umnambithi/Ladysmith Local Municipality. This chapter will include the presentation and the research type.

Although the focus of this study is water usage and the effectiveness of local government, quite often sanitation will crop up, as water and sanitation goes hand in hand.

## 4.2 METHODOLOGY

This research project is an example of a mixed methods research. Mixed methods research combines or mixes quantitative research and qualitative research in the same study or a series of studies (Swanson & Holton, 2005:82). It evolved from researchers who started realising that aspects from both quantitative and qualitative research were required in order for them to answer their research questions. This view is supported by Onwuegbuzie and Leech (2005:375-387), who also argue that a combination of both methodologies should be used as both have inherent strengths and weaknesses. According to Warfield (2010:28-35), mixed methods research is a three stage process, namely:

1. Determine whether the study is a confirmatory or exploratory study;
2. Determine the type of data collection and operation; and
3. The type of data analysis and inference.

Therefore the study was conducted using both qualitative and quantitative approaches. The researcher used interactive and non-interactive strategies in the research project.

The subjects of the study were drawn from the two sectors of the community, namely the households and municipality employees. The participants were eight community members and four municipality employees and one management personnel member. Unstructured interviews were conducted and open-ended questions were utilised. Community members were interviewed in their home yards and municipality employees in their work stations and one employee at the municipality office.

The community members were randomly selected and the interview was conducted at their places. The atmosphere was very relaxed and not threatening because it was in their backyards. The two interviews with the municipal employees were conducted on the same day and for the community it took the whole full week in different sections of Ezakheni Township, that is, section A, B, C and D while section E was left out due to safety reasons. These interviews lasted approximately sixty

minutes and all the respondents were made aware of the purpose of the study. The data collected was transcribed during the interview.

### **4.3 DATA COLLECTION**

Section 151 (1) of the Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996), defines the category of municipalities that can be established. A category C (district) municipality is a municipality that has municipal executive and legislative authority in an area that includes more than one municipality. A category B (local) municipality is a municipality that shares municipal executive and legislative authority in its area with a Category C (district) municipality within whose areas it falls. The Constitution therefore provides for joint responsibility between Category C (district) municipality and the Category B (local) municipalities within its area of jurisdiction to ensure service delivery to the communities within their respective service areas.

In terms of section 10 of the Municipal Structures Act, 1998 (Act No. 117 of 1998) as amended, there are the following types of Category C (district) municipalities:

- a) A municipality with a collective executive system;
- b) A municipality with a mayoral executive system; and
- c) A municipality with a plenary executive system.

The Emnambithi/Ladysmith Municipality is a Category B (local) municipality with a collective executive system (Emnambithi/Ladysmith Municipality Performance Management Policy Framework Draft, 2012/2013).

According to Census 2011, the Emnambithi/Ladysmith Local Municipality has a total population of 237 437 people. The Emnambithi/Ladysmith Local Municipality forms part of the Uthukela District Municipality, with Ladysmith, Ezakheni, Steadville and Colenso/Nkanyezi as main urban areas. There are five municipalities within the Uthukela District Municipality, namely the Emnambithi/Ladysmith Local Municipality,

Imbabazane Local Municipality, Indaka Local Municipality, Okhahlamba Local Municipality and Umtshezi Local Municipality (Uthukela District Municipality, 2011).

Water related issues are handled by the Uthukela District Municipality and not by the Emnambithi/Ladysmith Local Municipality. The Uthukela District Municipality supplies water in its district because it has the powers and functions to do so. In this project when the Emnambithi/Ladysmith Local Municipality is referred to the Uthukela District Municipality is meant because it deals directly with water supply.

Ezakheni Township, including its surroundings, has a population of 70809 and comprises households of 18222. It is made up of Ezakheni A -7809, Ezakheni B - 7423, Ezakheni C - 16145, Ezakheni D - 8987, Ezakheni E - 14391, and Ezakheni surroundings (rural) 16054.

Generally, water is available in Ezakheni Township and the surrounding areas, as 44% of the community have access to piped water. Out of these, 19% have water in their houses, 16% have water in their yards, 4% have access to water which is within the national standard of within a walking distance of 200 m, and only 5% within a walking distance of more than 200m. This is followed by 44% of the population that access water from the local schools. Only 6% of the population do not have access to piped water (Uthukela District Municipality, 2011).

Looking at people's livelihood strategies in poor rural communities, it is evident that people require water for both domestic and productive needs. Access to reliable supplies of water is needed for a great number of activities, supporting people's livelihoods (de Mendiguren & Mabelane, 2001).

South Africa's water resources are scarce. There is a need to conserve and control the demand for water in order to use efficiently and effectively so as to ensure its current and future supply. Water is one of the basic resources human beings are reliant on. It is an absolute necessity for human health and survival. Access to water at its source is in fact only a small element of access to water services. For water to be accessible, infrastructure, technical and management skills, and adequate funds are the essential elements. The safe supply of water to people results in improved health. Without access to safe water people are forced to rely on

sources which may carry water-borne diseases. The journal Umsebenzi highlights a water crisis in the Delmas municipality where water contamination resulted in a typhoid fever outbreak. Cases of typhoid fever were confirmed in Gauteng and had a link to Delmas, Mpumalanga. Safe, clean water is necessary to avoid the risk of such outbreaks (Umsebenzi, 2005:38).

The priority development issues for the Emnambithi/Ladysmith Local Municipality are physical infrastructure and services; social development and services; economic development; and land reform. Urban areas have far more services than rural ones but a much smaller population, indicating a clear imbalance in service provision. The Driefontein Complex has been identified as an area for priority spending. It has the highest population concentration but the lowest service standards. (<http://www.ladysmith.co.za>)

#### **4.3.1 Sources of data**

The data for this research was obtained from various sources. The first source was human subjects from the local municipality and the community. The second source was the Census data from 2011, which can also be retrieved from the website of Statistics SA (<http://www.statssa.gov.za>). The other sources were observation, newspapers, magazines, the Internet and different books.

#### **4.3.2 Interviews with community members**

First respondent from section A

One of the subjects, when asked if they do pay for water usage, responded by saying he does pay for water services. The only thing that is not good about paying for water services is that he pays a “flat rate” because whether you consume more or less water, the price is the same for everyone in the area. Whether he does receive statements or not, the respondent said, “It’s very rare to receive a statement; there

are no water readings on the statement indicating the consumption of water by the household”.

The respondent also indicated that the local government is very inefficient; he pays for water even if they are away from home as a family due to the flat rate paid on a monthly basis. With regard to the turnaround time for repairing any burst pipes in the community, the respondent said, “municipality is poor. They do not respond timeously or sometimes a month can pass-by before repairing any infrastructure in the area”. In terms of water usage at home, the response was that he is very cautious because water is scarce and he pays for it.

#### Second respondent from section A

On the other hand when another participant staying in the same section as the other participant above was interviewed, he pointed out that at his home they do not pay for water because he is aware that some sections within the township do not pay, why should he bother. In addition, he has never seen a letter from the municipality at his residence reminding them about payment for water consumption. According to him nobody ever came and took a meter reading in his home. They use water for washing, gardening and cooking, but never paid for the service. “Water is free from other sections why do they have to pay, for example in section D there is no meters installed but they do consume water”, he said.

Generally, water supply in the area is bad. There are water cuts on a daily basis in the area and also water may be cut-off for approximately a week without consultation. The municipality is not doing what it is supposed to do to improve the infrastructure system in the area as there are water leaks all over the place. Water runs through the roads and nobody is accountable for that water while they want residents to pay. “The municipality has taken no steps for non-payment of water services from the residents since he stayed in this place,” said the participant. When the taps drip in his home or a pipe leaks they do nothing about it because water is not paid for in his home.

#### First respondent from section B

The participant from “B” section of Ezakheni has acknowledged that they do not even pay a penny for water usage in her home. The reasons for the non-payment are that the Ezakheni area was regarded as a poor area with high unemployment and poverty rate. Furthermore, no statements were ever received stating their debt for water usage, and no steps have been taken against the non-payment of the service provided.

According to the respondent the municipality is very reluctant to upgrade the infrastructure in the area, therefore in turn they are reluctant to pay for services. This participant also pointed out one incident when they reported a burst pipe to the municipality to repair, they were told that it is their responsibility to repair that pipe and not the municipality's. They had to stay with the flood of water in their yard for weeks, without the pipe being repaired. They kept on reporting the pipe and no-body came to repair it. They were forced to request the services of a local plumber who charged them an exorbitant price. If the pipe had been repaired by the municipality they would not have paid anything. Since then, they have had no trust in their municipality, sometimes they receive contaminated water from the municipality and they are not being consulted.

#### Second respondent from section B

This respondent told the researcher that there is nothing good about their municipality. Therefore they will not pay for any services to this local government. The way water is used by people in the area tells the story that it is not paid for. You will find that water is left running from the taps when washing is done and watering of lawn pipes left unattended. “Wasting of water is evident in each section due to unrepaired infrastructure and car washes in every corner,” said the participant.

### First respondent from section C

The subject who was interviewed from this section pointed out that the service delivery is poor in the area. She mentioned the fact that they cannot pay for water services while water had been cut in the area for so many years. They had been suffering for approximately more than 5 years. There is no consultation on the part of the local government to notify the community about the reasons for the water cuts. This situation had been happening long before the climate change. She further told the researcher that she understands the climate change and that there is no rainfall, but the water service delivery was already a disaster before that time.

They do not receive letters from the local government notifying them of the water consumption at her home. She also said that at her home the gate is always locked and nobody has ever come to her home to take the meter readings. The use of water in the area is very bad because most of the residents have leaking taps and wasted water running down the streets. The municipality is doing nothing about that and in turn they expect people to pay for something that is not well looked after, in short, the municipality is not effective enough to care for community needs.

### Second respondent from section C

“Water is not paid for in this house,” said one participant. “There is no uniformity in the area, some neighbours do pay and some don’t.” This is how inefficient local government is in this area in terms of water usage. In this section the sewage flows all over the place and the municipality does not rectify the situation. He said they smell polluted air due to the municipality not attending to the environmental issues. Water leaks from residents’ homes and the workers from the municipality do not anything although they have seen the situation. Water usage is very high because people water gardens, wash cars, and many household chores are done and they do not foot the bill.

#### First respondent from section D

One respondent from D section said that there is no water meter installed in his home and therefore they do not pay for water services. He finds it very strange that the Uthukela District Municipality would say that there is a water shortage in the area meanwhile they are aware as residents that there is a dam in Estcourt called Wagendrift which supplies water to the Gauteng Province. How can they suffer and be asked to pay exorbitant prices if they have their own dam that is supposed to supply water to the community of Ladysmith.

He feels that things are done behind their backs by their very own local government. To worsen the situation, when things are out of control the local government does not notify them of any of the events taking place, for example the water cut in the Ezakheni area was implemented long before to the drought situation. He feels the government is very ineffective because they did not educate the community about the upcoming crisis so that the community could use water sparingly. Instead, money is used for unproductive events such as entertainment, calling for music artists to perform at their music and football Mayoral Cup. This is a waste of taxpayer's money.

#### Second respondent from section D

The respondent told the researcher that she does not pay for water services. She runs a business at her home and is aware that water consumption is high since she has six tenants using backrooms in order to earn a living wage. In addition, even if she was approached to pay water services she cannot pay for the simple reason that there is no water meter in her place. "The consumption of water would be based on what?" she said. The tenants also use water for various activities and cannot be controlled as they pay rent at the end of the month. She said she cannot confirm whether water usage in the house is wasteful or not, hence people use water when they need it.

According to her understanding water meters were not installed in some parts of the area because residents did not want to pay for services. The installers were chased out of the area.

#### **4.3.3 Interviews with municipal employees**

One of the employees in management was interviewed with regard to the effectiveness of the municipality in water usage in Ezakheni Township which falls under his supervision. The respondent supervises the Ezakheni and Indaka areas. The following were his responses:

The Uthukela District Municipality is directly involved with water service related issues while the Umnambithi/Ladysmith Local Municipality is involved in road, electricity, housing and other functions.

#### **Water supply**

The residents of Ezakheni have an adequate water supply. The only time they had a challenge of not being supplied with water in the area was when the pumps were malfunctioning and they had no water supply for about two to three days.

#### **Consultation /communication**

With regard to consultation with the community in terms of new developments and the demands for the community, he responded by saying flyers are issued to the residents and they also use media to reach the residents, e.g. radio and newspapers. They strongly use flyers which reach a number of residents.

#### **Meter reading**

In terms of meter readings in the area of eZakheni he said he was not sure if the municipality does send out people to read water consumption meters. He pointed out that it is the Finance Department's issue. The respondent was not certain whether all residents in Ezakheni have water meters in their yards or not.

According to the respondent, people of Ezakheni are paying for water consumption. The only exception he knows in the area is the lately built houses (RDP Houses) in

section C, where residents do not pay for water services. The reason for this is that water meters were not installed.

### **Handling of complaints**

Complaints are handled by the call centre where residents may lodge them directly in order to be solved. "Leaking and burst pipes are the priority for the municipality and the turnaround time for the complaint to be resolved is four hours," he said. The complaint will be logged in and he will know about the complaint in his area because the system is designed in such a way that his cell phone will notify him and he will attend to it quickly.

Once the problem has been attended to he will report back to the call centre in order to log off the complaint from the system. When residents phone they would be given a reference number.

### **Project planned**

For Ezakheni a project is in the pipe-line to take out the ailing infrastructure, such as asbestos pipes and replace them with PVC pipes because the older pipes are giving the community sleepless nights by bursting most of the time. The municipality is doing its best to supply the community with water continuously.

### **Public participation**

The municipality is involved bringing the community together so that they can share the common vision. Public participation is informed by the Integrated Development Plan (IDP). They call this plan (IDP) a 'wish list'.

The Integrated Development Plan (IDP) is a five-year plan which local government is required to compile to determine the development needs of the municipality. The projects within the IDP are also linked to the municipality's budget.

The IDP is an instrument which guides and informs all budgeting, planning, management and decision-making processes in a municipality. This statement is

also supported by the Department of Provincial and Local Government (DPLG, 2005:56).

### **The public's perception of the municipality**

The respondent said that the municipality is making more effort to improve the lives of people. He feels there are some gaps that need to be filled and some challenges with the residents that have to be met.

One of the employees interviewed warned the researcher by saying that the irregular of water supply in the area is a result of illegal connections to some parts of the water system. The respondent also indicated that sometimes the residents might be unwilling to pay for water services due to the fact that the water supply in the area is unreliable on a day-to-day basis. On the other hand, an ailing infrastructure, pipe leakages, and the non-payment of services are some of the problems the municipality faces. The interviewee concluded by saying that the demand for water exceeds the supply in the area.

#### **4.3.4 People's perception about water scarcity**

The researcher gathered from the interviews with the community and employees of the local government that there should be clear lines of communication for both parties. According to the sample drawn, one participant did mention that for local government to be effective it needs to have superb plans in place whereby the community understand the aims and objectives to be attained by their local government. In addition, the employee's view-point is that the commitment by the community is necessary in order to achieve the common goals, which are to report any wrong-doings and to be patient with the municipality to deliver services on time.

One employee in the local government stressed the importance of work commitment for their government to be effective. Furthermore, they said that the municipality should conduct a survey to ascertain the skills needed within the municipality.

Without water everything on earth will die. Activities such as swimming, car wash businesses, and gardening will come to a standstill because water is needed for all these activities. There is also the perception about water that drinking water before a meal helps digestion, taking water before taking a bath helps lower your blood pressure and a glass of water after waking up helps to activate internal organs. Furthermore, people say that drinking water at the right time maximises its effectiveness on the human body. Therefore without water all these functions cannot be accomplished if water becomes unavailable.

In some instances water shortage is due to physical scarcity or natural scarcity while the bulk of the problems are human or managerial factors, where water is not taken care of.

Water is a precious and scarce resource in South Africa. Water is life. Without it no cooking, bathing, recreational activities related to water, cleaning, building, drinking, manufacturing activities can take place and a multitude of matters could become impossible.

Burke (1995), says research has shown that 60% to 70% of an adult's body weight is water, suggesting that there is an important link between water and human life. The effective application of fresh water as a scarce resource is essential for the human race to survive in increasing numbers on planet Earth.

#### **4.3.5 Other means of using water effectively and efficiently**

According to Berry Everitt (in *Sun Newspaper* 27 March 2015:49) Managing Director of the Chas Everitt International Property group, recent cut-offs and restrictions have brought home to many customers just what a scarce and costly resource water is becoming in South Africa. And the shortages are especially evident in summer, so homeowners should be doing everything they can right now to cut usage and keep their bills down.

Some suggestions from water-savings experts include the following:

➤ **Water early and late**

Set the sprinkler system to water your lawn and garden beds in the pre-dawn or post-sunset hours. Without the sun competing for your water, you'll have more water going into the soil and you will have to water less frequently.

➤ **Don't water the drive-way or patio**

Check your sprinklers regularly to ensure that they are working properly and spraying water where you want it. Directional sprinkler heads will ensure that your watering rands are only spent on things that grow.

➤ **Install rain sensors**

Available from good hardware shops and irrigation equipment suppliers, these sensors will override a sprinkler system's setting so you don't double-up on Mother Nature.

➤ **Save the rain**

Putting water barrels or rain tanks under your downpipes to collect runoff from your roof is one of the best ways to keep outdoor water usage down. You can use the water to fill watering cans or buckets and water wherever your sprinkler system doesn't reach. If you install the tanks on platforms you may also be able to generate enough pressure to run a hose.

➤ **Don't pressure wash anything**

Use a rake, broom or leaf vacuum to clean up your lawn or driveway, and a bucket and sponge to wash your car.

➤ **Check for leaks**

Attend to any dripping taps immediately and check regularly for unseen leaks by turning off all your taps indoors and out (including the water suppliers to the toilet) and looking to see if your water meter is still turning. If it is, call an expert to find and fix the problem as soon as possible, because even a small leak could cost you

hundreds of rands a year. A dripping tap wastes about a litre of water per hour or more (Sun Newspaper, 27 March 2015:49).

According to Tabloid Newspaper (2015:02), communities are encouraged to conserve water by all means including installing water saving products at their homes such as a leakalserter that will detect and let the user know when there is a problem and evolve showerheads that will stop water from being wasted while waiting for the shower to become warm.

Furthermore, residents are urged not to leave taps open in anticipation of the water supply returning. This will prevent taps running uncontrolled thus wasting water in the event where there is no one to attend to it.

#### **4.3.6 Creating awareness in water conservation in the community**

As noted by the Ladysmith Herald Newspaper dated 29 September 2015, Uthukela District Municipality and Acaicavale Primary School held a Water Conservation Day at the school. Learners presented talks, poems and plays on how to save water, while Uthukela officials held educational talks on how to save water in homes.

Educational programmes will help local government as well as households to minimise costs by fixing leaks and promote water saving equipment.

Local government must have community forums where they discuss ways and means of saving and conserving water. Furthermore, create a website to assist the community to save water and a toll-free number to be contacted when they come across water wastage in the community, for example a burst pipe and leakages difficult to detect, as well as a sense of community ownership of water assets through empowerment approaches.

The above methods could assist in reducing the level of vandalism of the communal water infrastructure and illegal connections.

#### **4.3.7 Responsiveness of local government in tackling leakages in the community**

The community feel that local government is not doing enough in tackling leaks in the community. They want their municipality to respond within forty-eight hours, which is not the case at present. The municipality says it has a four-hours' turnaround time.

The performance management policy was developed in accordance with the prescriptions of promulgated local government legislation, regulations and other guidelines. The following legislative framework is relevant to the development of the performance management policy:

- a) The Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996);
- b) The White Paper on Local Government, Published in 1998;
- c) The Municipal Structures Act, 1998 (Act No. 117 of 1998), as amended;
- d) The Municipal Systems Act, 2000 (Act No. 32 of 2000), as amended;
- e) The Municipal Structures Amendment Act, 2000 (Act No. 33 of 2000);
- f) The Municipal Planning and Performance Regulation, gazetted in August 2001; and
- g) The Municipal Finance Management Act, 2003 (Act No. 56 of 2003).

The concept of performance management for the third tier of government was first raised in the white paper on local government. The concept document indicated that 'there is a need for a national management system to assess the overall state of local government, monitor the effective implementation of development strategies adopted from different municipalities and ensure that scarce resources are used efficiency'. Furthermore, 'to provide an early warning where municipalities are experiencing difficulties and enable other spheres of government to provide appropriate support before a crisis develops'. It would also enable municipalities to

compare their own performance with that of similar municipalities across South Africa, identify successful approaches or 'best practices', and learn from one another (Emnambithi/Ladysmith Municipality Performance Policy Framework Draft, 2012/2013).

In dealing with unaccounted water, Singapore implemented various measures which are categorised as leakage control, full and accurate metering system policy, proper accounting of water used and legal enforcement to curb illegal connections. Under the leakage control programme, the use of better quality pipes and fittings, pipe renewal, intense detection of leaks and minimising response time to repair leaks in the distribution system is promoted (Ng Han Tong, 2002:81).

The National Water Authority in Singapore has invested in a high-quality metering system, such as compound meters. This comprehensive metering effort has helped to bill households accurately and efficiently. In addition, the legislation says that a perpetrator would face a fine of \$ 50000 (fifty thousand dollars), or imprisonment for up to three years behind bars (Ng Han Tong, 2002:81).

The Emnambithi/Ladysmith Local Municipality can take lessons from the above example.

#### **4.3.8 Development of training programmes for unemployed youth in rural areas**

South Africa loses on average R7 billion a year to water losses (Sunday Tribune, 22 March 2015:04). In the State of the Nation address President Jacob Zuma outlined the plans to counter this problem, which would include the training of fifteen thousand (15000) artisans who will fix leaking taps in their communities. According to the Department of Water and Sanitation spokesperson, dozens of previously unemployed youth had already been trained and sent back to their communities to fix leaking taps and pipes. They will earn a stipend from their local municipality. The spokesperson said that the department had partnered with private-sector training institutions to train youths to become plumbers.

#### **4.4 CONCLUSION**

Based on the data obtained from the interviews, it can be concluded that if the Umnambithi/Ladysmith Local Municipality wants to raise their flag flying high, they must improve their standard of service delivery to the community at large. The subjects have all agreed that local government has challenges which cause poor service delivery and result in being less effective. These challenges are, among others, a lack of focus, lack of motivation, poor management skills, and lack of passion. Even though people are trained, water leakages and wastage are still evident at this municipality in the Ezakheni area.

Community members are positive towards working with the municipality, and they need to be informed about whatever local government is doing because they are part and parcel of this government. In addition, the stakeholders must work together as one team to attain the goal of national government, which says “together we can achieve more”.

Chapter five will explore the findings and will deal with suggestions on how local government can be effective and enhance its service delivery to its community and how to improve its image, especially to the community of Ezakheni Township.

# CHAPTER 5: FINDINGS OF THE EMPIRICAL STUDY

## 5.1 INTRODUCTION

Chapter four dealt with the presentation, analysis and interpretation. Therefore in this chapter the findings will be presented and the results thereof.

From the human development perspective, good governance is democratic governance. Democratic governance means that:

- People's human rights and fundamental freedoms are respected, allowing them to live with dignity.
- People have a say in decisions that affect their lives.
- People can hold decision-makers accountable.
- Inclusive and fair rules, institutions and practices govern social interactions.
- Women are equal partners with men in private and public spheres of life and decision-making.
- People are free from discrimination based on race, ethnicity, class, gender or any other attribute.
- The needs of future generations are reflected in current policies
- Economic and social policies are responsive to people's needs and aspirations.
- Economic and social policies aim at eradicating poverty and expanding the choices that all people have in their lives (Insession, 2015:04).

Based on what the researcher has obtained it is clear that the local municipality has not done enough to work in collaboration with the community of Ezakheni Township up until the last minute to prevent the crisis of water scarcity.

## **5.2 FINDINGS AND THE RESULTS OF THE EMPIRICAL STUDY**

Earlier on it was pointed out that water and sewage are inseparable, it is therefore interesting to note the following:

### **Water**

The water supply is a very challenging situation to deal with. Due to the huge numbers of residents the pump pressure becomes very low as the demand for water is very high at the same time. Because of the low water pressure, sparse amounts are available for each household. Each section of the townships is normally equipped with one pump per section. The water is used for everything from cleaning clothes, cooking, drinking, bathing, and cleaning the house. Since very little water is accessible to each section it is very hard to get enough water for a household per day. This could be ameliorated by making some improvements to the main water supply and adding more pumps in each region in the township, but it should come from a different water system that allows more water in each area and which is not subject to lower pressure.

### **Sewerage**

The sewerage system within the townships is very poorly planned and constructed. The population is continually growing and since the sewerage system was not built to accommodate a growing population it is not able to deal with it, causing an overload on the system. The overload then causes problems such as frequent blockages, surcharges, as well as spilling over and causing the roads to flood. Most areas within the townships have a limited number of public toilets that are so over-used, abused, and quickly become health hazards for the community. One problem that was not foreseen when the houses were built so close together and so densely packed in one area, is the poor access for maintenance of the sewerage system.

With so many houses in one area and very little room in between the houses makes it very difficult for someone to go in and fix the pipes. Whether it is a local plumber or a government plumber, the job is very difficult to accomplish and when they finally do get around to fixing the pipes it could end up causing more issues, such as more flooding, traffic around the area of construction, and a long time for the resident to go without water. Some of the areas on the outside of the townships or near riverbanks and tributaries do not have access to facilities because they are not connected to the formal waterborne sewerage system.

### **Findings from the community of Ezakheni Township**

The findings suggest that the local government does not fulfil the basic services to the society. Furthermore, this is an indication that some of the councillors in different wards lack leadership skills and have no capacity to deal with the community effectively. As was pointed out earlier by one of the respondents that some of the municipality employees were employed through nepotism this is supported by the fact that most basic services to the community are not delivered. Dusty roads still exist within the township, there are illegal dumping sites, sewage spill-overs and water cuts every day during off-peak hours.

It should be noted that a massive volume of leakages inside community houses has resulted in water bills that few residents could afford to pay while other residents totally ignore those bills. However, the municipality pays no/little attention to household leakages. This situation causes high levels of wastage resulting in excessive sewer flows necessitating the upgrading of the local sewerage treatment works at enormous expense.

The researcher endeavoured to ascertain from the community whether local government is effective within their area of its jurisdiction. The author discovered that the community is dissatisfied with the local municipality for a number of reasons, namely that the area is filthy, there are sewage spill-overs in the area causing health hazards, the water supply by water tankers to the villagers is inadequate, and leaks around the area are unattended. When the municipality is called by the community

to fix leaks in their yards they take ages to respond or else never show up. They also emphasised that the municipal workers tell them that they are short staffed and there is a shortage of vehicles.

Section 152 (1) of the Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996) refers to the objectives of local government, which are:

- a) To provide democratic and accountable government of local communities;
- b) To ensure the provision of services to communities in a sustainable manner;
- c) To promote a safe and healthy environment; and
- d) To encourage the involvement of communities and community organisation in the matters of local government.

These objectives seem unattainable based on the research findings provided by most participants during the interview processes. The participants are dissatisfied with the way their municipality operates especially in water-related issues.

During the interview the respondents pointed out to the researcher that most of the workers within the municipality had no skills for the job they are employed for. They are employed through nepotism and that is why they cannot attend to community call-outs.

Community members further alluded to the fact that they are still dependent on boreholes and open streams in the post-apartheid era. Furthermore, water deliveries into the area remain a challenge for the Umnambithi/Ladysmith local municipality despite the great efforts by national government to improve water supply. One of the community member's interviewed said that the inadequate water supply in the area is caused by illegal connections and the culture of non-payment for water services by the community at large. The maintenance of infrastructure is therefore impossible from the point of view of local government if no revenue is generated.

On the other hand, the interviewee said that they are frustrated with their local municipality because there is no communication/ consultation between them and the municipality. Local government officials do as they wish because when they feel they want to switch off the water they will do it without prior notices to the community. Water could be switched off for approximately five days. In addition, when the water comes back on it would be very muddy and undrinkable.

The other respondent also mentioned that when they do come across problems of leakages in their homes, the municipality would not attend to their problems because they are not paying for water services and would only attend to those who pay for water services. In the sections of Ezakheni Township some residents do receive bills and some not. The residents ignore the payment demands for of services because they are aware that the municipality does nothing about non-payments.

One other member of the community told the researcher that the municipality has no system in place for any queries from the community, for example you may report a burst pipe in the area or in your place of residence and no reference number is given in order to follow up the problem reported. You can report the same problem more than six times (over and over again) and nothing will happen.

In addition, it has been noticed that the residents of Ezakheni Township use water haphazardly because they do not foot the bill. However, they would like the local municipality to provide services when they are in difficulties. But the residents of Ezakheni Township are in contravention of the National Water Act, 1998 (Act No. 36 of 1998) that has a number of provisions that impact on water management, which, among others, include the use of water resources, protecting them from being exploited and polluted or degraded and ensuring that every citizen of the country has equal access to the scarce resource. But these people are turning a blind eye to protecting the use of water.

Communities have a responsibility to register with the Department of Water Affairs, but since local government failed to install meters for all residents in the area it is impossible to impose heavy fines on people who misuse the resource, although the Act says that those who are in default should be penalised.

The Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996), Section 152 (1) (e) and The Municipal Systems Act, 2000 (Act No. 32 of 2000) say:

One of the objects of local government in terms of the Constitution is to encourage the involvement of communities and community organisations in local government. The Municipal Systems Act, 2000 (Act No. 32 of 2000) deals with community participation.

The following is a summary of Chapter 4 of the Systems Act:

A municipality must develop a culture of municipal governance that complements formal representative government with a system of participatory governance. The Systems Act emphasises three elements:

- The municipality must foster participation in:
  - The IDP process;
  - The evaluation of its performance through performance management;
  - The budget process; and strategic decisions regarding service delivery.
- The municipality must enable participation through capacity building in the community and among staff and councillors.
- Funds must be allocated and utilised for the above purposes.

Based on what the researcher gathered from the community this process is non-existent in their local municipality. They are not happy because they say they are not involved.

### **Findings from local government employees**

The findings indicate that employees who deal with water services cannot cope with the workload of fixing burst pipes and leakages in the community. There are quite a

number of leaks within the township. The difficulty arises when they attempt to fix these water pipes which are caused by the ageing infrastructure.

The research findings suggest that there are plans in place by the national government to remedy the situation within the local municipalities, namely fifteen thousand unemployed youth would be trained as artisans who will fix leaking taps in their communities to curb the country's water wastage (Sunday Tribune Newspaper, 22 February 2015:04).

The researcher can only single out lack of stability at leadership level as having the potential to derail service delivery. When there is no stability in municipalities, there cannot be efficient service delivery.

The employees have justified their lack of commitment by saying that they are just working to feed their families and to earn a salary. The workforce agreed that the community does not benefit from what they are doing. There is a lack of communication. Most of the time leadership members are not at work, they are at work only if they want to be at work.

When asked what they perceive to be an example of a lack of commitment the responses were: the high rate of political friction, absenteeism, late coming most employees and irresponsibility.

### **The results of the empirical study**

According to the Mayor of the Uthukela District Municipality, the Uthukela district is among the water service authorities that have been declared disaster areas in terms of the Disaster Management Act, 2002 (Act No. 57 of 2002) due to a lack of rainfall during the past summer. The impact of the drought conditions continues to increase at Indaka local municipality, as the Oliphantstokop Dam dries out more every day. The bottom of the dam (basin) is beginning to be exposed.

The situation has prompted the leadership of the Uthukela district to conduct brief meetings with councillors, traditional leaders, community development workers and

community representatives to discuss the drought crisis in the area, which affects many people. The pumps have been switched off from the dam to prevent pumping out mud that might damage them. To further compound the situation attributed to the drought, the fish in the dam are dying, causing huge problems, as their rotting carcasses contaminate the remaining water. The situation might cause many diseases and even more complications if rain does not fall, and subsequently the source will have to be cleaned to remove any poison resulting from dead fish prior to supplying water from this source to communities.

“What we need right now is rain to replenish our rivers and dams. We must all play our part to conserve water during this dry time,” said Uthukela District Mayor. Water restrictions will be implemented immediately across the district to ensure that everyone has water (even if the taps have run dry in some areas) and that some degree of potable water supply is maintained. Plans are in place to supply water through tankers in affected areas. The Department of Water and Sanitation has added five more water tankers to assist with the distribution of water. In addition to this, JoJo tanks and tankers will be made available in some areas to ensure that communities have access to drinkable water (Times of Ladysmith, 2015:03).

According to the country's Constitution, 1996 (Act No. 108 of 1996) all South Africans have the right to basic services.

Water scarcity in the country in general is evident as its availability is projected to dwindle by 2030 and is manifested in water cuts in Ezakheni Township in particular. Water cuts affect the ability of households to perform basic activities such as cooking, washing, drinking, etc. Big community projects, for example the building of houses, are affected as the progress is stopped at intervals. This further has an effect on building labourers as they do not get paid their wages if they did not work. This in turn has an impact on the labourers' ability to provide food for their families.

Furthermore, water shortages also impact the tourism sector and industrialisation. If there is no water, there are no tourists and industrial development is also cut back.

There are other role-players that are affected in the area of Ezakheni Township, such as:

- a) Department of Public Works - responsible for community-based public works programmes, for example roads and bridges;
- b) Department of Education - responsible for the curriculum and there should be adequate water and sanitation facilities, for example at schools and TVET Colleges;
- c) Department of Housing - responsible for new housing developments for which they require sufficient water to perform their mandate;
- d) Department of Health - responsible for the community's health care for which water and sanitation facilities should be provided, e.g. clinics, chemists and private doctors;
- e) Department of Environmental Affairs and Tourism - responsible for environmental policies. Water is crucial to environmental sustainability;
- f) Businesses (private sector) - responsible for providing food and job creation;
- g) Society - people who should receive the service from the municipality;
- h) Department of Police Service - responsible for safety, peace and stability of the community. People awaiting trials need enough water in police custody;
- i) Department of Justice - responsible for enforcing the laws. The public servants in the institution and the public attending cases require water.

If the municipality persists in not monitoring water usage in Ezakheni Township the situation could become worse for the community. The effects of this are already evident in the Indaka Local Municipality where water resources are completely depleted and cattle and crops are dying.

In addition, if the community and companies continue with wasteful water practices the cost of water is going to become exorbitant and, will become less and less affordable.

The Minister of Cooperative Governance and Traditional Affairs has agreed that there are public servants who are not qualified academically but who have acquired valuable experience and are trying to do their best in carrying out their responsibilities. At last the President of the Republic of South Africa has noticed the value and importance of education and skills in respect of service delivery in our country. He also pointed to the danger of corruption and nepotism in the recruitment of public sector staff in his address on issues of poor service delivery at the Gallagher Convention Centre in Midrand.

The Minister agreed with the President that those whom they employ should not in turn hire their friends and relatives, but qualified people who can stick to their job duties and perform them efficiently. There should be no compromise in ensuring that officials possess skills and the necessary qualifications. However, the Minister had no doubt that changes will boost service delivery ahead of the 2016 local government election (The New Age, 26 March 2015:19).

Once businesses have no water, they will shut down, which will mean major job losses, while the economic growth of a country would decline and people would die.

The lack of water is keeping children away from school. Consumers will pay more for food if drought continues to hit hard in the area because too little rain has prompted farmers to delay planting their crops. The agricultural sector would not be in the position to provide food for the nation and the little they have would cause them to raise prices which would have an impact on inflation. The lack of water would heavily affect the energy sector as no electricity would be generated, since a lot of water is utilised in power stations. Livestock would be heavily affected and eventually would die. This would mean that human beings would also be affected because as human beings we rely on the following for survival: livestock, agricultural products, and electricity (power) to perform various activities.

If communities are not supplied with adequate water by their municipality they might resort to boycotts, vandalism of infrastructure and cause problems to other residents in demanding water deliveries. There is no uniformity in terms of meter installation and penalties throughout the Emnambithi/Ladysmith Municipality.

The misuse of water has led to shortages in the neighbouring communities with the result that some of the municipality workforce has become corrupt.

The Batho Pele (“People First”) principles are aligned with the Constitution – know the service you are entitled to. Government officials must follow the “Batho Pele” principles which require public servants to be polite, open and transparent and to deliver good service to the public. The following are Batho Pele principles:

➤ Consultation

*Citizens should be consulted about the level and quality of the public services they receive and, wherever possible, should be given a choice about the services that are offered.*

There are barriers to communication with citizens on the part of local government.

➤ Service standards

*Citizens should be told what level and quality of public service they will receive so that they are aware of what to expect.*

After water cut-offs in the area water comes back contaminated.

➤ Access

*All citizens should have equal access to the services to which they are entitled.*

Not all citizens enjoy tap water.

➤ Courtesy

*Citizens should be treated with courtesy and consideration.*

There is unequal treatment in terms of meter installation in the area.

➤ Information

*Citizens should be given full accurate information about the public services they are entitled to receive.*

No information is provided about water consumption.

➤ Openness and transparency

*Citizens should be told how national and provincial departments are run, how much they cost and who is in charge.*

A flat rate is paid by some residents while others do not pay anything.

➤ Redress

*If the promised standard of service is not delivered, citizens should be offered an apology, a full explanation and a speedy and effective remedy; and when complaints are made, citizens should receive a sympathetic, positive response.*

People are ignored and complaints not resolved timeously.

➤ Value for money

*Public services should be provided economically and efficiently in order to give citizens the best possible value for money.*

The rule should be 'pay as you use' and not a flat rate.

The performance of the Emnambithi/Ladysmith Municipality as a whole will only improve if the performance of every individual, either employed in or involved with the municipality, improves.

### **5.3 CONCLUSION**

Local government has to plan for the future to provide for people currently living in villages and who rather want to stay in urban areas. Government has to make projections of population growth and plans have to be in place to provide water on an equitable basis.

Local government's responsibility is to manage water resources and to deliver water services to the community, which is enshrined in the Constitution, 1996 (Act No. 108 of 1996). At present local government is not complying with the Constitution of the Republic of South Africa mandate in terms of providing its residents with access to a basic water supply. However, the residents of Ezakheni do also not comply with the Constitution of the Republic of South Africa by wasting the country's scarce resource.

The National Water Act, 1998 (Act No. 36 of 1998), attempts to ensure that the nation's water resources are protected, used, developed, conserved, managed and controlled in a sustainable manner, for the benefit of all. But it is clear that both Ezakheni residents and the Uthukela District Municipality do not adhere to the Constitution for the simple reason that they do not protect the scarce resource by using it effectively and efficiently and repairing leakages in the community promptly. Therefore it is the responsibility of all citizens to ensure that water is protected at all costs.

Chapter six will therefore explore the findings and summarise the study and make recommendations on how the local municipality can enhance its image to the community and improve its service delivery.

# **CHAPTER 6: SUMMARY, RECOMMENDATIONS AND CONCLUSION**

## **6.1 INTRODUCTION**

In Chapter five the findings and the results of the empirical study were presented, interpreted and analysed. In Chapter six the recommendations will be made and conclusions drawn.

## **6.2 SUMMARY**

A municipality is required to give effect to the provisions of the Constitution and priority to the basic needs of the local community which it is expected to serve, promote the development of the local community, and ensure that all members thereof have access to at least the minimum level of basic municipal services (Craythorne, 2006:159).

The study has shown that there was a lack of responsibility by both the community and municipality employees. The effectiveness of the municipality is shown by its commitment to serve the community and the improvement of the infrastructure to enhance the lives of the community, but this commitment does not exist. It has been noted that in order for the municipality to work effectively its employees need to implement good leadership and work towards the goals and vision on which the municipality's existence is based.

When employees were asked about their tasks of responsibility it was ascertained that they do not enjoy their duties but are only there to earn a salary and not to assist the community to advance their lives. They, as well as their leaders, lack commitment and motivation.

Some of the employees did mention that their jobs are boring, demotivating, exhausting, unsatisfying, politically influenced and are the lowest paid jobs. Some feel that their local government should come up with decent remuneration and better privileges.

The researcher feels that the management has contributed much to the lowering of standards in the municipality. The municipality should have rules and obligations for it to be governable and manageable. Therefore it became clear that both workers and management do as they wish, without being accountable to anybody.

Unethical behaviour within the South African public sector, and throughout the world, has reached endemic proportions. For this reason, laws and codes of conduct are put in place and institutions are created to curb corrupt and dishonest acts and behaviour. Unethical behaviour in the labour environment hurts employees and the society at large and several suggestions have been made to encourage ethical behaviour in the workplace.

Ezakheni Township and the Uthukela district's management of water resources should be aware that South Africa is generally an arid to semi-arid region, with an average rainfall of approximately 500 mm per annum, compared to a world average of 860mm. Furthermore, the rainfall is unevenly distributed, with 65 per-cent of the country's surface area receiving less than 500 mm per annum of which 21 per-cent of the area receives less than 200 mm. Of the mentioned 'fallen rain' only 10 per-cent reaches the rivers which constitute the country's crucial potable water resource. Not only do they accumulate, contain and convey the surface runoff of rain, but the surface waters and groundwater are intimately interrelated.

Groundwater may eventually, via fountains, reach the rivers on the surface or even flow from underground water compartments in underground rivers (Fuggle & Rabie, 2005:647). The result is that potable water is a scarce resource, and often the biggest limiting factor for the development, among others, of new residential areas in a town or city.

In both instances, community and staff members of the local government sample group felt that if the management was effective, they would be motivated to be good

citizens who pay for services and who report timeously when infrastructure is vandalised, and workers who are committed to their jobs by coming early and do not absent themselves unnecessarily from their workstations.

It was evident that there was a lack of accountability in local government. If management did their job well, and both society and employees were accountable, the culture of ownership and responsibility would be encouraged. Working together as a community should be emphasised, although it became evident that no work interdependence existed.

The time spent on job (hands-on) is less than the time spent having intervals. The employees are aware that currently the municipality does not have a good image in the community at large.

### **6.3 RECOMMENDATIONS**

It has been noted that local government lacks skills in service delivery and leadership abilities, and for this reason major steps need to be taken to address the challenges that face the municipalities.

The national government has seen a gap in service delivery and came up with strategies to rectify the situation. According to the Minister of Cooperative Governance and Traditional Affairs more than fifteen thousand (1500) councillors are set to boost local governance skills through the South African Local Government Association (Salga). Salga, in partnership with Wits University, will train councillors from the two hundred and seventy eight (278) municipalities across the country in the areas of finance, communication and leadership skills.

A Salga spokesperson said that training would run throughout April. The training was voluntary at the moment but they encouraged the municipalities to make funding available for their councillors' training.

Salga has started rolling out an ambitious 18-month portfolio-based councillor development programme that aims to achieve an enrolment target of five thousand

one hundred and eighty (5180) councillors. The councillors will be provided with knowledge and practical skills to address service delivery challenges within their communities. The programme, which will be implemented together with the Local Government Sector Education and Training Authority, is aimed at achieving Salga's strategic goal of developing an empowered workforce and leadership. At present, Salga is holding a three-day national members assembly, which aims at revising the anticorruption strategy for the sector and finalisation of the framework.

A Salga Chief Executive Officer said that the councillor development programme would help to address governance and leadership challenges in municipalities, issues which were often laid bare through the lens of municipal audit outcomes, and service delivery performance. Numerous reports had highlighted the critical need to develop the capacity of local government, including councillors.

The Minister of Cooperative Governance and Traditional Affairs recently launched a 'back-to-basics' campaign aimed at improving service delivery to communities.

Challenges that still need to be addressed include social distance by our public representatives. This reflects inadequate public participation and poorly functioning ward councillors and committees. Slow or inadequate responses to service delivery challenges are in turn linked to the breakdown of trust in institutions and councillors by communities.

He said the campaign had five pillars: putting people first and engaging with communities; delivering basic services; good governance; sound financial management and building capabilities (The New Age, 26 March 2015:04).

Effective management relies on effective measurement and accurate information transfer (Johnson, 2008). South African residential water use is metered for the purpose of billing consumers. The water meter reading is required for billing purposes by the local municipality's financial department and is typically read on a monthly basis in South Africa. The information is transferred via manual user input from meter readers' files to financial billing systems. The corresponding water meter reading and reading date for all water meters are stored in the financial billing system (automatic meter reading systems). The sensitive nature of the information

billing systems typically allows for limited access by financial staff only. However, information regarding the water-use volume is also needed by the local municipality's technical staff, or engineering consultants, to effectively manage the water use.

Ezakheni Township meters are inaccessible because they are inside the residents' places and meter readings become impossible.

The municipality should install water meters throughout its jurisdiction in order to bill the community efficiently and effectively. It has been observed in Ezakheni Township that not all residents have water meters in their yards; therefore there is no uniformity on the side of the municipality when it comes to issuing bills.

When planning for the future, the local municipality water service provider, that is the Uthukela District Municipality, and the government have to ensure that they can keep up with the population growth and development of the community they serve. This is crucial with regard to water and sanitation and the demand for water, since water is a scarce resource.

Community engagements in Ezakheni Township and surrounding areas affected by water rationing should be conducted by the municipality to make the community understand the rationale behind the recently implemented water restrictions. The information should also be cascaded through various mediums such as local newspapers, community radio stations, churches, schools, taxi ranks, shopping malls and other places. In an effort to save more water, the municipality should install water restrictors to every household affected by water rationing. Households should receive water through a restricted water supply method to ensure balanced water distribution in all areas that are affected by water rationing.

Communities should be encouraged to conserve water by all means including installing water saving products at their homes such as a leakalserter that will detect leaks and let the users know when there is a problem and evolve showerheads that will stop water from being wasted while waiting for the shower to become warm. The use of Jojo tanks to collect rain water is encouraged. This might minimise or else avoid water wastage in the community at large.

One of the easiest and fastest ways to optimise water consumption is to fix leaks as soon as possible. The identification of leaks can also be done through the installation of a logger on the water meter, which will measure and monitor water consumption on a day-to-day basis (Beverage Review, 2012:44). Grey water systems are also an option.

Water restrictions should be implemented throughout the district to avoid water wastage and heavy penalties should be imposed on the community. Restrictions should include but not be limited to: Watering of driveways should not be allowed, watering of lawns should not be allowed, however, watering of plants with buckets would be allowed, but this should take place on alternative days. Those with swimming pools in their yards should not be allowed to fill them. Window cleaning should not be allowed at all. In addition, the use of hosepipes in car washes should not be tolerated.

The district municipality should employ unemployed youth in each municipality and perform door-to-door visits prior to leak repair interventions to raise awareness of the leakage problems and the need to save water. These unemployed youth could also assist with community workshops, schools programmes, clinic workshops, taxi rank workshops, and councillor liaison.

The government should stop appointing people on the basis of how well they dance and sing struggle songs during public gatherings, but rather on how best a person is able to tackle pressing social issues. Many service delivery protests are triggered by corrupt and incompetent public servants.

As a matter of urgency the Uthukela District Municipality should sink boreholes for residents affected by water scarcity together with the community in order to solve the situation. All boreholes that are both malfunctioning and not activated should be refurbished and reactivated as a matter of urgency to restore water supply to the residents of Ezakheni and other areas under the Uthukela district. Water tankers should be used as a short-term solution to supply water to residents because this might cost the municipality a huge sum of money while water is unavailable.

The lack of stability at leadership level can be singled out as having the potential to derail service delivery. When there is no stability in municipalities, there cannot be efficient service delivery. Public participation is the cornerstone. If the community and councillors do not talk to each other no solutions to the problems affecting them will ever be found.

All stakeholders have to make sure there is stability among them because playing games with the lives of the people cannot be the way to go. The researcher believes the way forward is to form very important partnerships and believes we can only do it if we stand together.

The households should avoid wasteful usage of potable water to flush toilets and water gardens instead they should use grey water.

The households should bear in mind that they are the end users of water and it is their responsibility to take care of the scarce resource by using it effectively. There are two ways in which households can acquire water, firstly through the water service provider supplying water in the municipality they belong to, and secondly directly from a water source such as boreholes, springs, rainwater tanks, surface water, rivers and other means.

According to DWAF, (2002:18) households have duties and responsibilities to:

- Pay agreed rates for water services provided;
- Support the water service provider by reporting leaks and illegal connections;
- Identify their water services needs and jointly negotiate with their water service provider to meet their needs;
- Monitor their water service provider and water services;
- Ensure that the containers in which water is kept or transported are clean, and that open containers in which water is stored are kept covered; and

- Ensure that water used directly from the source be treated with bleach or boiled before it is used for drinking.

### **6.3.1 Recommendations to local municipality**

Community participation is one way of obtaining information from the community about service delivery. The researcher strongly recommends that the local municipality should hold road shows (izimbizo) to its community.

There is a strong legal basis for community participation in municipal level development planning. Participation is highlighted in the Constitution, the White Paper for Local Government, the Municipal Systems Act, 2000 (Act No. 32 of 2000) and other policy instruments (Dlamini, 2007:22).

The view of Dlamini, (2007:02) is supported by the National Council of Provinces (NCOP) (2015:16) with its theme 'Taking Parliament to the People' (TPTTP) whereby they conduct site visits to local municipalities and hold public meetings to hear directly from the citizens about their service delivery challenges.

The researcher would also suggest the following to the local municipality:

- Encourage households to repair their own internal leaks and to embrace save water practices within the home.
- Lowering pressure in the water system to prevent leakage in the infrastructure.
- Local plumbers should be recruited to minimise internal plumbing leakage in their community to perform basic low-cost household leak repairs.
- Create awareness to conserve and save water through schools, churches, and in recreation places.
- Reduce water consumption to households in order to minimise wastage.

- Development of training programmes for the previously unemployed youth in their communities to curb the shortages of skills, especially in rural areas where people do not have jobs and people are not educated about saving water.

The above suggestions could yield savings for the municipality budget and save millions of cubic metres of water per year.

Furthermore, for the Uthukela District Municipality to be able to deliver the service in a sustainable fashion to its citizens, specifically 'water', the following is recommended:

- The local municipality should immediately install meters in appropriate places around the whole area of Ezakheni Township.
- The water service provider, that is the Uthukela District Municipality, should ensure that meter readings are conducted on a monthly basis.
- Repair all meters or replace faulty ones.
- Identify consumers who cannot afford to pay for the services.
- Upgrade ageing infrastructure.
- Reduce water pressure to all households.

The following is a list of good governance principles suggested by Bakker & Cameron, 2002 to local municipalities which they might consider:

- a) Participation;
- b) Environmental protection;
- c) Transparency;

- d) Protection of public health and safety;
- e) Equity, efficiency and effectiveness; and
- f) Accountability for stewardship and performance.

As part of a good governance process, every entity may develop its own governance principles to be followed and these are not prescribed principles.

Local government should ensure that they make predictions of water usage in the future on a day-to-day basis as such predictions would be utilised to meet the demand for water within its jurisdiction. These predictions should be based on two measurements: the trend of demand for water and the population growth rate.

#### **6.4 CONCLUSION**

On the basis of the results of the empirical study and various reasons (for example, a lack of leadership abilities, lack of motivation, decreasing quantities and qualities of potable water, a lack of service delivery to the community) the researcher argues that the effective municipal management of water resources faces a very difficult environmental situation due climate change.

The study has exposed a huge crisis on the side of management which prompted the non-compliance of the residents with payment for services, wastage of scarce resources, namely water, as well as infrastructure vandalism. These problems resulted in a lack of trust.

The Uthukela District Municipality should create an environment whereby a platform is created to engage with the community to take part in the decision-making processes and to listen to the demands of the community. In addition, the management should look at ways and means to motivate all stakeholders and satisfy the needs of the community they serve.

Should the management of the Uthukela District Municipality be able to motivate its employees and employ the right staff with the right skills and technological know-

how, the community would cooperate with them. The researcher can clearly say the level of co-operative governance and integrated water resources management is unacceptable.

The above views are supported by the country's Constitution, 1996 (Act No. 108 of 1996) which lays down the so-called 'social contract' between the South African Government and the country's citizens by structuring the three spheres of the governmental legislature (national, provincial and local) and the execution of its public policies. The government is morally obliged to be sensitive to, to identify, and in earnest take notice of the unlimited needs of the country's citizens. Through effective prioritisation the government is expected to determine which issues should be addressed through effective and efficient public administration and management in an attempt to add value to the respective communities and the country's society as a whole (South T.D. 2008:157-173).

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