URBAN WATER PROVISION IN MASERU (LESOTHO): A GEOGRAPHICAL ANALYSIS

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Urban water provision in Maseru (Lesotho): A Geographical analysis

by

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Declaration

I declare that this thesis submitted for a Masters degree at the University of the Free State, is my own independent work and has not been submitted by me to any other university/faculty.

I also cede copyright of the thesis in favour of the University of the Free State.

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Bloemfontein
May 2005

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TABLE OF CONTENTS **PAGE**

LIST OF FIGURES

LIST OF TABLES
PAGE

LIST OF ACRONYMS

ADB	:African Development Bank
DRWS	:Department of Rural Water Supply
FAO	:Food and Agriculture Organization
GWP	:Global Water Partnership
ICWE	:International Conference on Water and the Environment
IWRM	:Integrated Water Resources Management
LHWP	:Lesotho Highlands Water Project
NTU	:Natural Turbidity Units
SADC	:Southern Africa Development Community
TAMS	:Consultancy Company
UN	:United Nations
UNCHS	:United Nation Centre for Human Settlements (Habitat)
UNDP	:United Nations Development Programme
UNEP	:United Nations Environmental Programme
WASA	:Water And Sewerage Authority
WHO	:World Health Organization
WSSD	:World Summit for Sustainable Development
WRC	:Water Research Council

CHAPTER ONE: SETTING THE SCENE

1.1 THE RESEARCH PROBLEM

Water is the most indispensable of all basic human needs. It is needed for drinking, cooking, washing, bathing and cleaning. It is also important for hygiene and public sanitation. Indeed, water-borne diseases contribute to the deaths of at least four million children in developing countries every year (United Nations, 1996). Untreated household sewage, industrial effluent, agricultural runoffs, and inappropriate land use patterns are some of the major threats to safe water sources. Despite these facts, the provision of water services in urban areas of developing countries remains one of the major challenges currently facing governments (Linn, 1983). This is particularly so because there is a delay in the provision of urban services, including water, while urban populations are growing at alarming rates (Rakodi, 1993).

Lesotho is no exception in this regard. There are major changes occurring in the country that will have great impact on water resources, and these changes are of great importance in setting policy and determining management strategies (TAMS, 1996a). One of the major challenges that face the government of Lesotho is sustainably meeting the water demands of the ever-increasing population, particularly in the urban areas. In fact, the government of Lesotho has, as one of its Millennium Development Goals, decreasing the proportion of people without sustainable access to safe drinking water and basic sanitation (Government of Lesotho, 2003; Ministry of Finance and Economic Planning, 2000). It is therefore important to examine what the government has undertaken in order to achieve this enormous task and to assess the successes and problems encountered. The critical elements in explaining access here are mainly adequate, safe and convenient or reasonable distance to the major source of water (African Development Bank, 2000; United Nations Development Programme, 1997).

According to the Bureau of Statistics of Lesotho (2002), about 60% of the urban population in Lesotho had access to piped water on their premises in 2001, while about 24% accessed water through communal standpipes. Adding these two figures means that about 84% of the

urban population in Lesotho had access to piped water, whether through a communal or a private connection. These figures may look impressive, but considering the current rates of population growth and urbanisation that the country has been experiencing lately, this may not be enough. Lesotho's population is currently growing at the rate of 2.6% per year, while the urbanisation rate ranges between 7 to 11% (Bureau of Statistics Lesotho, 2003). The report further notes that most of the growth is happening in Maseru, the capital city, which currently accommodates around 36% of the urban population in Lesotho. It must be noted that urban growth, particularly in Maseru, continues to increase, mainly as result of internal migration in which people move from the highland areas, which are mainly rural, to the lowland areas where major towns are located. Unemployment has been a major repellent that encourages this type of migration (Bureau of Statistics Lesotho, 2002). The consequential urban growth in Maseru has resulted in rapid urbanisation of areas that were traditionally rural, thereby further increasing the need for expansion in the provision of urban amenities in these areas.

The above problem is made even more complex by the fact that the Water and Sewage Authority (WASA), which is the body responsible for supply and delivery of water to all urban areas in Lesotho, has been faced with a multitude of problems that has rendered it inefficient (TAMS, 1996a). The authority is currently serving only 50% of the population within its area of designation. Along with this, the authority has not been able to introduce a significant change in tariffs to enable financial viability since its formation in 1992. This has not only led to failure in maintaining assets, but also failure and inability in expanding services (TAMS, 1996b).

On the other hand, an argument is often put forward by those who advocate free water, that water is abundant in Lesotho. Indeed, surface water resources are substantial in Lesotho and far exceed the present and future needs of the nation (Eales, Forster and Mhungo, 2000). One would therefore wonder why the Government of Lesotho has put water provision high on its priority list. In order to understand the nature of the resource, it is necessary to bear in mind some of the characteristics of water supply. Firstly, the seemingly abundant availability of water can be misleading as only a fraction of it is used. This is mainly

due to high runoff and inaccessible mountain terrain. Major capital-intensive engineering that Lesotho cannot afford would be required to harness this water for use by people. Secondly, water is always unevenly distributed over space and time. This results in water being available in abundance where it is not needed and lacking in areas that need it most. It is therefore government's responsibility to ensure even distribution of water, hence the need for expansion of water provision services in newly urbanising areas.

It is also worth noting that problems of payment for water provision do not only rest with governments, but also involve the very people that governments are trying to serve. As has been demonstrated, payment for water services is necessary, because it determines the sustainability of the service, and the mere fact that Lesotho has plenty of surface water does not imply that payment for the resource should not apply. What is important is formulation of a payment strategy that takes into account the ability of the poor to pay. This strategy must enable provision of water at a cost that will enable recovery of the initial cost of providing it, thereby enabling sustainability, while at the same time making the resource accessible to the poor. It is often assumed that the poor cannot pay for urban services, particularly water. It must be accepted that, to some extent, the desperate poverty of the urban poor makes it difficult for them to display much willingness to pay for services (Giles, Brown and Davies, 1997). However, there is increasing evidence that, because of the same desperation, the poor are in fact willing to pay surprisingly large sums for water. This is also the case in Lesotho, and because of this often false assumption, the Government of Lesotho has been caught in the trap of trying to meet the water needs of the poor while at the same time aiming to achieve cost recovery, in the formulation of policies. However, neither of these aims has been achieved through these contradictory subsidisation policies (TAMS, 1996a). Instead it is because of these policies that WASA has experienced shortfalls in revenue, which has resulted in deterioration in the quality of service and in delays or failure to expand into other areas.

Overall there is a lack of an appropriate water policy and management system to manage the growing demand for urban water supply in Maseru (TAMS, 1996a). If such a policy

and management system is not introduced soon, it might become impossible to provide water on a sustainable basis to Lesotho's urban population.

1.1.1 Research objectives

The overall aim of this study is to investigate water provision and water policy in Maseru. In order to achieve this, the study has the following objectives:

- To analyse the state of global water resources and the impact of the depletion of water resources at community level, particularly in cities of the developing world, where urban poverty prevails, together with underlying problems, such as population growth and urbanisation that threaten the availability of the resource.
- To examine issues of population growth and urbanisation and their effects and implications on water provision over time, in the context of Lesotho and specifically in Maseru, where the majority of the urban population live.
- To examine policy that guides water provision in the urban areas of Lesotho, with the aim of contributing towards informed and therefore effective policy formulation in water provision
- To investigate people's perceptions of current levels of access to safe water as one of the critical components of water provision.
- To make recommendations towards informed policy formulation for better urban water provision

1.1.2 Conceptualisation

In order to guide the analysis and for purposes of clarification, a number of key concepts used in the study will be defined. This is to clarify the context in which these concepts have been used in the study. Firstly the concept of "water provision" will be defined. This will be followed by other concepts that are directly related to water provision, such as "access to water, "water supply", "water affordability" and "water availability".

According to UNDP (1997), "water provision" means the process of making water of acceptable quality and quantity readily available for human consumption. It must be noted that the concept of "water provision", as TAMS (1996a) and UNDP (1997) recognise, includes other processes of water supply and delivery, and must be continuous in order to be successful. "Water supply" is the collection of bulk water and does not necessarily include delivery of the water for household consumption (TAMS 1996a). In actual fact

TAMS (1996a) further recommends that, in order for water provision to be successful, the process of bulk water supply and that of delivery must be undertaken by different bodies. It must be noted, however, that in some cases "water supply" and "water provision" have been used interchangeably as in ordinary English language particularly where the phrase "water supply system" is used. "Access to water" means the opportunity or the right to use water, and as demonstrated earlier in this chapter this is influenced by factors such as quality and quantity of water, the convenience of a water supply system and even the cost of water (UNDP, 1997; African Development Bank, 2000; UNEP, 2001). "Water affordability" as described by Bergen (1999), implies the ability to access water, which is specifically influenced by wealth, while "water availability" implies the overall ability to obtain water.

1.2 DESCRIPTION OF THE STUDY AREA

Lesotho is a landlocked country, entirely surrounded by South Africa, and is located between latitudes 28° 35' and 30° 40' South, and longitudes 27° 00' and 29° 30' East. It is a country of high mountains and deep valleys and more than 75% of its 30 648 km^2 is higher than 1 750 metres above sea level (see Figure1.1). The country is divided into three main topographic regions, namely the lowlands, the foothills and the mountains. The lowlands form the Western part of the country, descending towards the Caledon River that forms the border with South Africa. This is the most populated and highly cultivated of the three regions. The foothills region is an intermediate zone to the East of the lowlands and below elevations of 2 000 metres above sea level. Rapid population increase in this region is highly anticipated as a result of population expansion in the lowlands. The mountainous region is to the East of the country along the Maloti-Drakensberg Mountains. This region is dissected by rivers systems that form steep slopes and escarpments. The region is the least populated.

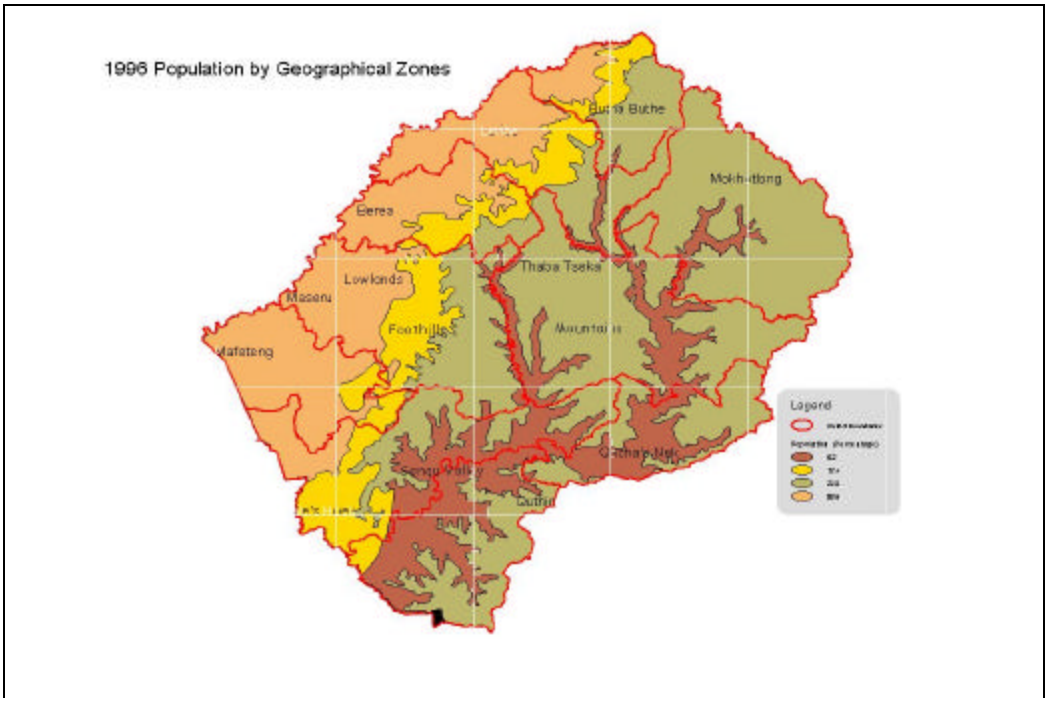

FIGURE 1.1: Population by geographical zones

Lesotho is divided into ten administrative districts, one of which is Maseru, the capital town. It must be noted that the study focuses on the urban parts of Lesotho, which are mainly located in the lowlands region. Maseru forms a large proportion of the lowlands region, and is located near the Eastern border with South Africa (see Figures 1.1 and 1.2). The town therefore displays the same characteristics as others in the lowlands. It was not until the end of the Second World War that the small town that Maseru was started growing faster. The town has in actual fact experienced a doubling in population growth after every decade since 1966, and projections show that population growth will increase further (Maseru Development Plan, 1991). In Maseru, the Thetsane area, commonly known to the local people as Ha-thetsane, has been used as a study area (see Figure 1.2), the reason being that, this area closely resembles the overall conditions prevailing in Maseru in terms of physical planning.

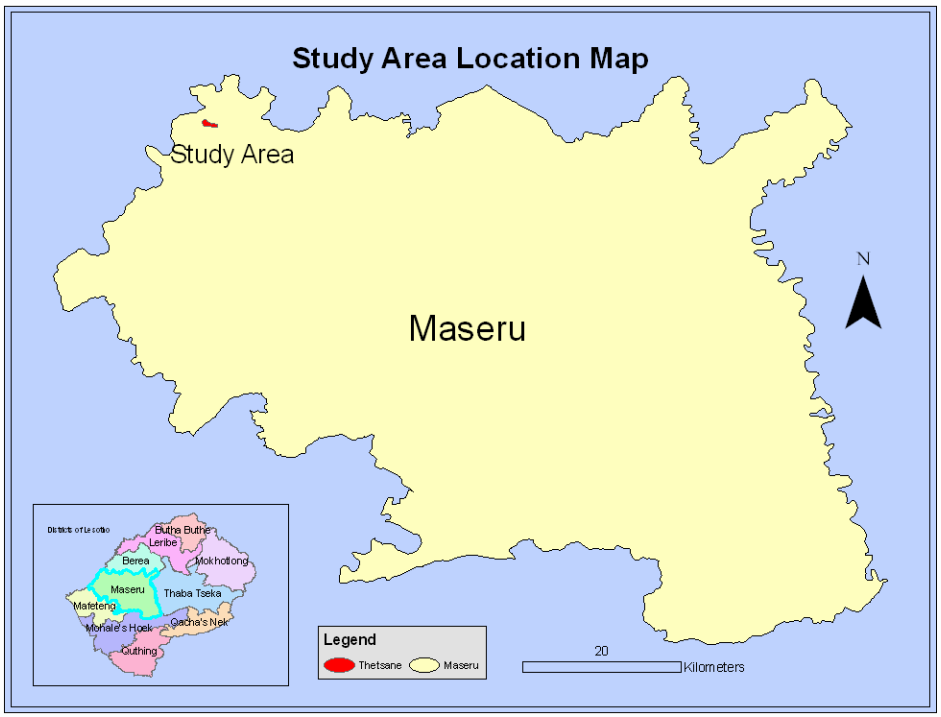

FIGURE 1.2: An overview of the study area

1.3 METHODOLOGY

The theoretical parts of this study are based on an extensive literature review undertaken throughout the study period. For the empirical part, information was gathered by means of personal interviews and structured questionnaires. Personal interviews were held with WASA officials in the administration and in the operations departments. Specific questions were asked to reveal the current status of operations within the company. Personal interviews were also conducted with different government officials in the water sector, particularly the Department of Water Affairs. Further personal interviews were also conducted with residents within the study area. This helped to further clarify issues that could not be covered via the structured questionnaire method. For the questionnaire administration, households were used as major units of analysis. About twenty-five questionnaires were distributed in each one of the four sub-areas that make up the Thetsane area, and data was collected in the form of a structured interview. In total, 100 questionnaires were distributed.

The methodology used in this study is therefore based on a number of procedural techniques. Firstly, for parts of Chapter One and the entire Chapter Two, extensive literature overviews were conducted to analyse the global picture of water provision and factors that influence it in a more general perspective. Secondly, while parts of Chapter Three and Four are based on literature overviews, most of the information on these chapters was collected through personal interviews with different bodies in the water sector, particularly WASA and different government departments, as well as census data. This information helped with the analysis of the picture painted in Chapter Two in the closer context of Lesotho, specifically the urban capital, Maseru. Lastly, the most practical part of the study, which is in Chapter Five, was carried out through the structured questionnaire method. This method enabled direct gathering of data on the actual perceptions of the people living in the study areas to be done. The data was analysed and the results are as outlined in Chapter Five. Great care was taken to maximise accuracy. The procedure followed is outlined in the next section.

1.3.1 Division of study area into sub-areas

In order to ensure a wider representation of all types of households in the study area, the area was divided into four sub-areas according to major factors that influence the distribution of water supply systems. These include factors such as the level of planning of each sub-area and income levels. The four sub-areas are:

- Newly developed, high income, planned area
- Newly developed, middle to low income, planned area
- Newly developed, low income, unplanned area
- Old, low income, unplanned area

Table 1.1 below gives a synoptical description of the sub-areas.

TABLE 1.1: Summary descriptions of the sub-areas

Sub areas	Description of area	Estimated number of households	Sample taken	% Sample
1	Newly developed, high income, planned area	650	39	6
2	Newly developed, middle to low income, planned area	350	21	6

3	Newly developed, low income, unplanned area	300	20	6
4	Old, low income, unplanned area	400	20	5

As the above table shows, four distinct types of households in the study area were observed and these were formulated into sub-areas. The above case is also the situation for Maseru city as a whole where areas are formed by households within close proximity of each other that display similar characteristics, such as a similar source of water. For the study area, these sub-areas can be summarised as firstly, the newly developed, high income, planned area which is identified as sub-area 1 on the table. Secondly, there is the newly developed, middle to low income area that is also planned which is sub-area 2 on the table. Thirdly, there is the newly developed, low income and unplanned area, which is sub-area 3 on the table; and lastly, there is the old, low income and unplanned area, which is identified as sub-area 4 on the table. As the table further shows, the sub-areas have different estimated numbers of households ranging from just above 300 to above 600. To ensure a balanced representation of all household types, an almost equal percentage (approximately 6%) of samples were taken from each of the sub-areas. Questionnaires were distributed throughout each sub-area using the simple random sampling method.

Despite the arguments put forward in this study to address issues of equity and efficiency in water provision, the study also recognizes that water provision should be viewed within the economic realities of a country, and that budget constraints should be managed and focused on priority areas. Delivery systems to enable access to water for all, particularly for the poor, should therefore be affordable to both the government and the beneficiaries in order to be sustainable.

1.4 RESEARCH AGENDA

Chapter Two (Water provision in cities of the developing world: A literature overview) gives a literature overview of the main aspects related to urban water provision in the developing world. Firstly, there are statistics on availability of water at a global level together with the underlying problems of depletion of freshwater resources and increasing urban growth. The problem is brought down to community level, where the challenge of

urban growth in cities of the developing world and the implications for water provision will be discussed.

The overview of the main aspects related to urban water provision is followed by **Chapter Three (A historical perspective of urbanisation and water provision in Lesotho with specific reference to Maseru).** In this chapter, water provision is analysed at a more local level, in the context of Lesotho, with specific reference to Maseru, the capital city. Here a temporal assessment of the problems of population growth and urbanisation is given. Together with this, an assessment of water provision over time, particularly in Maseru, where the majority of the urban population resides, is also given. The outcomes, which illustrate the status of the country with regard to urban water provision, will be looked at. These assessments are done against the background that failure to achieve adequate water provision results in deterioration of the health status of people, and the cost of redressing the situation far exceeds the initial costs of water provision (UNDP, 1997). Finally, the chapter analyses health aspects in relation to water.

The assessment of water provision in the context of Lesotho will be intensified and made more specific to Maseru in **Chapter Four (Water Policy in Lesotho with specific reference to urban Maseru)**. Water availability and delivery calls for intervention of government as it targets the entire population. However, there are underlying issues such as cost of water, affordability, customer ability and willingness to pay for services, which need to be considered before water can be made available. This entails the formulation of policies and policy assumption around these issues if provision of water to all is to be achieved. This chapter, therefore, analyses these policies and their consequences on the situation of urban water provision.

The aspects of water provision in Lesotho, particularly in Maseru, discussed in Chapters Three and Four, are empirically tested in **Chapter Five (Perceptions of residents of Maseru urban area on water provision)**. The chapter mainly analyses access to water as one of the vital elements in water provision. Access is looked at in terms of the level of service or type of supply being used. As has been mentioned, the type of supply will

determine the critical essentials of adequacy, safety and convenience of the water supply. A high level of service or an in-house type of service will indicate high access and vice versa. The chapter also analyses these essentials in terms of the different sub areas within the study area. These analyses raise another important element of income differentials that also play a major role in water provision.

Finally, **Chapter Six (Synthesis: Recommendations re garding policy formulation for urban water provision in Lesotho** attempts to logically integrate, in a more comprehensible manner, the findings of the study in order to formulate recommendations for better water provision services in urban Maseru.

CHAPTER TWO: WATER PROVISION IN CITIES OF THE DEVELOPING WORLD: A LITERATURE OVERVIEW

According to Yima (2000), the worldwide demand for water is growing rapidly, and in many countries the cost of developing new supplies is becoming almost unaffordable. At the same time increased water pollution is worsening the imbalance between water supply and demand. For these reasons it is of critical importance that water resources are developed.

This chapter aims at providing a literature overview of the main aspects related to urban water supply in the developing world. Against this background, the chapter is structured as follows (see Figure 2.1). Firstly, the global statistics on water availability are provided. Then the global challenge of rapid urban growth, brought about by rapid population growth, especially in the urban areas of the third world, is given, together with the effects of urbanisation. This is specifically done to indicate the considerable increase in demand for urban water. Risk and water resources management is also discussed. This is followed by a discussion on the importance of water, together with an outline of the benefits obtained as a result of improvements in urban water supply services. Affordability of water in Third World cities, in terms of the price of water and in relation to the minimum requirements for basic needs, is also discussed. This leads to a discussion of problems encountered by water services providers in Third World cities in terms of the ability and willingness of people to pay for services. Furthermore, a discussion on the utilisation of water is given. This particularly focuses on the amount and distribution of water for different purposes. Lastly, the chapter discusses the issue of gender and water provision in Third World cities.

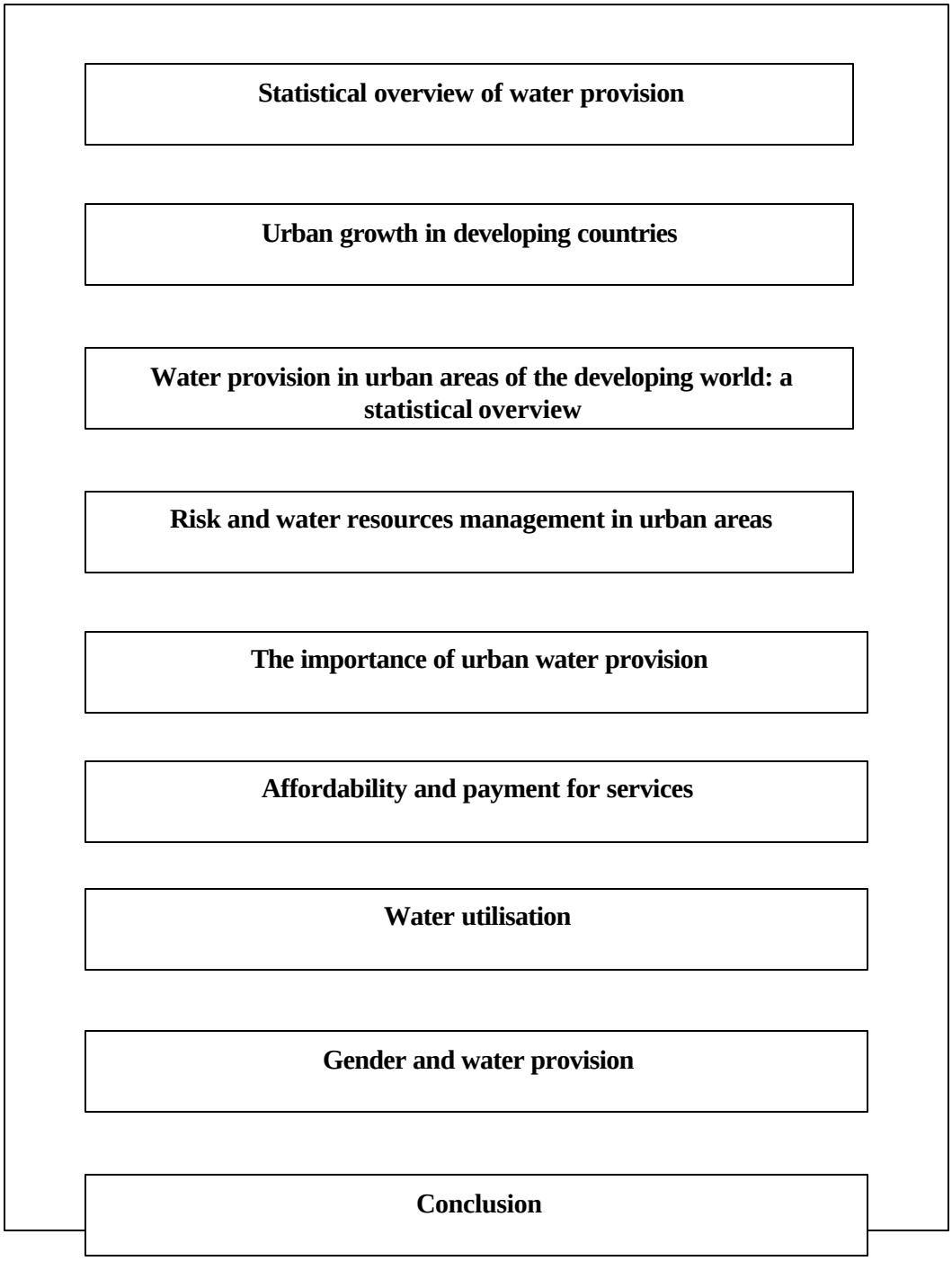

FIGURE 2.1: An outline of Chapter Two

2.1 STATISTICAL OVERVIEW OF WATER PROVISION

2.1.1 Global water availability

Miller and Tyler (1994) reports that, of all the water on earth, 97% is saline water found primarily in the oceans. The remaining 3% is freshwater (see Table 2.1).

TABLE 2.1: Statistics on global water resources, 1996

Global total	1.41 billion Km^3
Salt water	1.38 billion Km^3 (97%)
Freshwater	0.03 billion Km^3 (3%)

Source: UNCHS, 1996a

Around 2.997% of this is stored in the icecaps of Antarctica and Greenland, and as fossil groundwater. The most accessible freshwater resources are in lakes, reservoirs, rivers and streams, and these resources amount to only 0.003% of the total amount of fresh water in storage. It should be noted that 87% of the freshwater is locked in ice caps and glaciers, and most of the rest is underground, in the atmosphere, and in living organisms (UNCHS, 1996a).

2.1.2 Urban water access

At the community level, UNCHS (1996a) recognises that availability of water varies considerably from area to area. Auclair (1999) adds that the availability of potable water in urban areas increases rapidly with income. He describes potable water as water that is free from contamination and safe to drink without further treatment. He notes that piped water is normally regarded as potable, while river water in which people wash or excrete is not, and this further reduces the proportion of the already limited freshwater resources that can be readily used. Table 2.2 shows availability of water in urban areas in different regions of the world.

TABLE 2.2: Water access in urban areas of the different regions of the world in 1999

Region	Percentage of households with water access
Africa	69.1%
Arab States	88.2%
Asia	87.5%
Industrialised countries	99.1%

Source: Bergen, 1999

As indicated in the table, urban areas in Africa, where a large number of the less developed countries are located, has the lowest level of access to water. Industrialised countries, on the other hand, have the highest level of access, (more than 99%). It can be concluded therefore that at least 30% of urban households in the lowest income countries do not have access to clean water. By comparison, almost everyone living in cities in the developed countries has access to potable water.

Therefore, one can conclude that, even though our planet may largely be made up of water, only a small fraction of this is available for human use. Water availability becomes even more of a problem because the limited freshwater resources have to serve different sectors of the economy, such as, industry, agriculture, and the ever-increasing population (and urbanisation). This high competition among water users results in access to the resource being largely determined by income (Rakodi, 1993). This becomes even more of a problem in cities in the developing world where the competition for access to water increases. The situation is further aggravated by the ever-increasing population in cities in the developing world, as will be discussed in the next section.

2.2 URBAN GROWTH IN DEVELOPING COUNTRIES

The section above provided a broad overview of water supply in the world. Population size and population growth rates in different countries of the world are key variables in relation to human living conditions and resource utilisation. It this section, world population growth trends will first be discussed. This provides the background for a more in-depth analysis of population growth in cities.

2.2.1 World population trends

In 1995 the population of the world was estimated by the United Nations (1996) as 4.84 billion, and the rate of increase was 1.67%, per year (Reitsma and Kleinpenning, 1989). The largest proportion of population in the world (76%), and the highest rates of increase are mainly in the less developed regions where growth rates of greater than 3% are still occurring in many countries even today (Reitsma and Kleinpenning, 1989). United Nations Environment Programme (1987) further argues that, although the population growth rates in

major regions in the developed world are beginning to decrease, a stable population in the world of between 8 and 14 billion is not expected until the end of the next century.

2.2.2 Urban population growth

Rakodi (1993) notes that, between 1950 and 1990, the world's urban population increased more than three times in size, from 730 million to 2.3 billion, and between 1990 and 2020 it is likely to double again, to over 4.6 billion. She also recognises that about 93 per cent of this increase will be in the developing world. This means that more than 2.2 billion people will be added to the already overpopulated cities of the Third World (UNCHS, 1996a). Figure 2.2 shows the projected population living in urban areas in the year 2020.

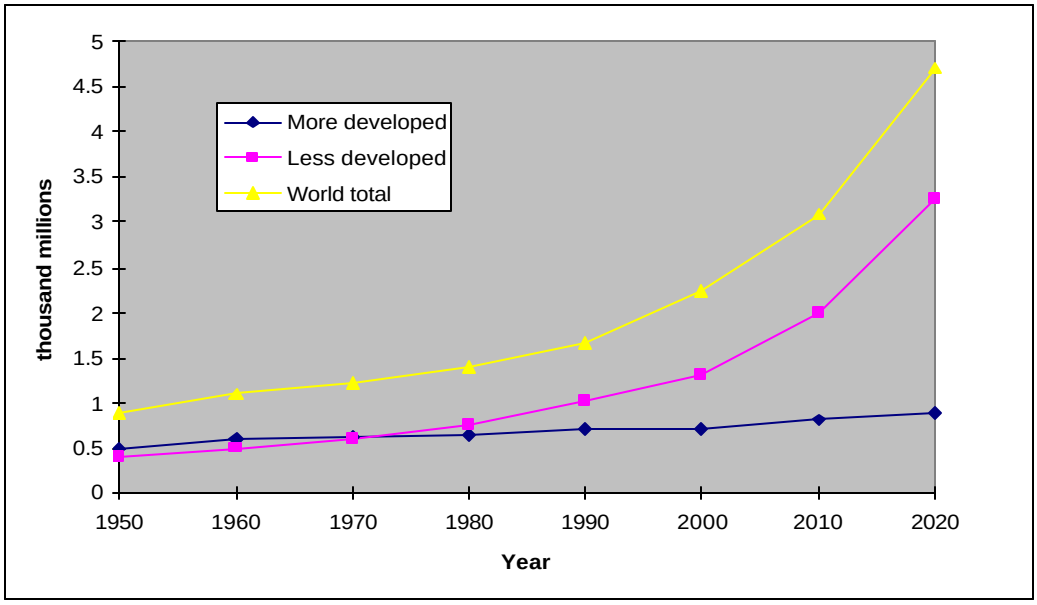

FIGURE 2.2: Projected population living in urban areas in 2020 (Source: UN, 1989)

The World Bank (1991) reports that, the developing countries have transformed from a world of villages to one of big cities and towns. As the figure indicates, the population in the developing countries was lowest in the 1950s and grew rapidly from the 60s to the 90s to overtake that of the developed countries, which was initially higher (UN, 1989). From 1990 onward the population growth rate in the developing countries has increased so rapidly that it will almost double in each decade. Projections indicate it will be almost three times that of the

more developed countries by 2020 (UN, 1989). The World Bank (1991) further notes that, since 1950, the urban population of the developing world has grown from under 300 million to around 1.3 billion persons. UNCHS (1996a) adds that annual growth rates of around four per cent have added 45 to 50 million new urban residents, as all countries have experienced sustained urbanisation. Rakodi (1993) also reports that projected demographic trends indicate continuing urban growth rates with an additional 600 million people living in urban areas of the developing world by the year 2020. She cites an example of Shanghai, which in 1960, was the only city in the developing world with more than 10 million persons, and reports that, by the end of the century, 17 mega cities will have reached that size. Another example, as noted by the World Bank (1991), is Mexico City and Sao Paulo, which are projected to grow to 25 million people by the end of the century, a figure equal to the entire world's urban population at the dawn of the industrial revolution in 1750.

The UN (1989) suggests that around 43 per cent of the word's population lived in urban areas in 1989. In the developing world this percentage was 73%, as opposed to 34% of for the developing world (see Figure 2.3). It should be noted, however, that such figures conceal huge variations in the population living in urban areas.

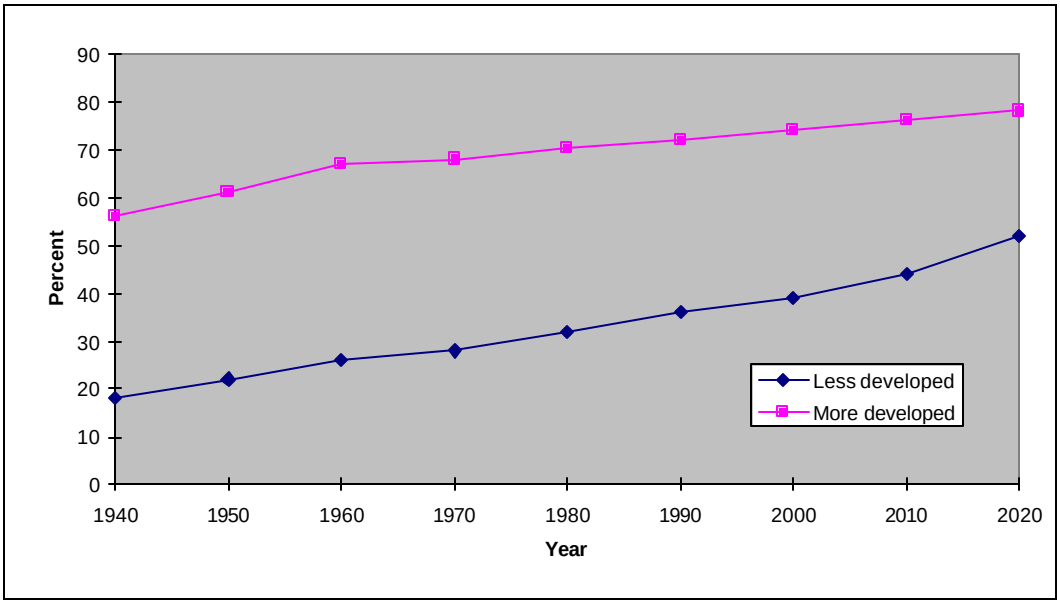

FIGURE 2.3: Proportion of population expected to be living in urban areas in 2020 (Source: UN, 1989)

UN (1989) further reports that several countries, especially in Africa, experienced a population growth rate of above 7 per cent per year in the early 1980s (see also Devas and Rakodi, 1993; Potter and Lloyd-Evans, 1998). If the current population growth rates are to prevail in the less developed countries, urban populations are highly likely to equal or even overtake those of the more developed countries by year 2020 (see Table 2.3).

TABLE 2.3: Average growth rate of urban population (% per year) between 1950 and 2020

Period	Developed countries	Developing countries	World total
1950-1960	2.46	4.88	3.46
1960-1970	2.04	3.93	2.92
1970-1980	2.33	3.71	2.56
1980-1990	0.94	3.60	2.48
1990-2000	0.76	3.60	2.58
2000-2010	0.61	3.32	2.51
2010-2020	0.45	2.79	2.21

Source: UN, 1989

Rakodi (1993) further recognises that the size of the urban population in the developing world overtook that of the developed world in the early 1970s, and is presently at about 1,400 million, compared to about 900 million in the developed world.

It is also important to consider the relationship between the urban and rural populations in the developing world (see Figure 2.4).

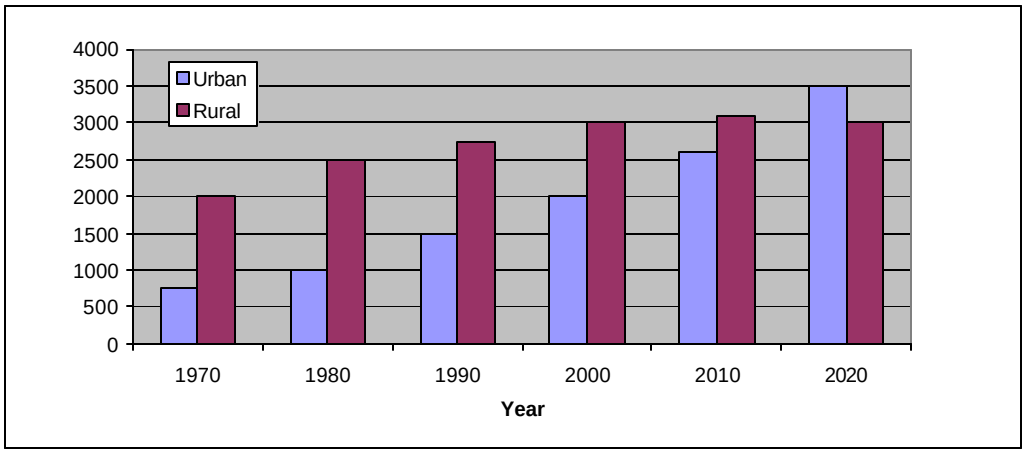

FIGURE 2.4: Projected urban and rural population in the developing countries between 1970 and 2020 (Source: World Bank, 1991)

As Figure 2.4 shows, around 1970 the urban population in the developing world was about half of the urban population. By 2000, the urban population was nearly equal that of the rural population. By 2020 it is estimated that the urban population of the developing world will overtake that of the rural population.

The implication of the statistical overview in this section is that the world's population is growing at a phenomenal rate and, in some cities, more than a quarter of a million people are added to the total population each year, overwhelming all efforts to improve conditions, while cities which are already larger than any known in the past continue to expand without apparent limit. This poses a huge challenge to those responsible for the management of development and the provision of services, and, as Rakodi (1993) notes, city planners and managers of the developing world face a huge task in providing cities with basic services (including water).

2.2.3 Effects of urbanisation on the provision of services in cities

The section above outlined the demographic reality of the world. The question is what the impact thereof is on the provision of services (including water). N'Dow (1996) is of the opinion that urbanisation is a reality that we must face and turn to our advantage, as cities are centres of economic and social development. However, increasing urbanisation will impact on the sustainable service provision and will increase the competition for water. This section will discuss these two impacts of urbanisation on water provision in cities.

Depletion, wastage and pollution of water resources are currently threatening the sustainability of economic and social development. Rakodi (1993) recognises that the provision of adequate supplies of water to industry, agriculture and growing numbers of urban residents, especially the urban poor, will indeed be one of the biggest challenges facing governments and local authorities in the near future. UNCHS (1996a) reports that, in the new millennium, cities in the developing world will not only have to face the challenge of providing adequate water and sanitation to their residents, but will also have to ensure that

the available water is not wasted or contaminated. As the report further notes, the levels of water unaccounted for in many cities of the world far exceeds 50% of the available water. This is a wastage that cannot be afforded when considering the rapid growth of population due to urbanisation. The implication here is that there is a need for better maintenance and management of urban water systems to reduce this loss.

In addition to the problem of sustainable water use, UNCHS (1996a) further recognises that water scarcity can be a potential source of social and political conflicts in the world. Rapid population growth in urban areas, brought about by urbanisation, particularly in cities in developing countries, has led to degraded environments and increasing competition for resources. This competition, particularly over water, may lead to social unrest, and already has in some regions of the world (UNCHS, 1996a). Miller and Tyler (1994) and Gleick (1994) support this by saying that the next wars in the Middle East will probably be fought over water and not oil. Most water in this arid region, as they note, comes from three shared river basins: the Jordan, the Tigris-Euphrates, and the Nile. Miller and Tyler (1994) expand their argument to Africa. According to them, disputes between Ethiopia, Sudan, and Egypt over access to water from the Nile River Basin are escalating rapidly. Ethiopia, which controls the headwaters of 80% of the Nile's flow, has plans to divert more of this water, and so does Sudan. This could reduce the amount of water available to water deprived Egypt, which is a desert except for the thin strip of irrigated cropland along the Nile and its delta. By 2025 Egypt's population is expected at least to double, increasing the demand for water. Its options are to go to war against Sudan and Ethiopia to get more water or to slash population growth and improve irrigation efficiency.

Gleick (1994) further reports that, there is also fierce competition for water between Jordan, Syria, and Israel, which get most of their water from the Jordan River Basin. The 1967 Arab-Israeli war was fought in part over access to this water. Israel uses water more efficiently than any other country. Nevertheless, it is now using 95% of its renewable supply of fresh water, and the supply is projected to fall 30% short of demand by 2005 because of increased immigration. Turkey by contrast, has abundant water. It plans to build 22 dams, which will drastically reduce the flow of water to Syria and Iraq, which lie downstream.

Indeed, the greatest threat to Iraq is a cut-off of its water supply by Turkey and Syria. Turkey actually plans to become the region's water superpower. It plans to build pipelines to transport and sell water to water-short countries like Saudi Arabia and Kuwait, and perhaps to Syria, Israel and Jordan.

This is a clear indication that the distribution of water resources and the sustainable delivery of water as a result of increasing urbanisation, will be a key issue in maintaining peace.

2.3 WATER PROVISION IN URBAN AREAS OF THE DEVELOPING WORLD: A STATISTICAL OVERVIEW

The focus now shifts from a macro analysis to specifics of water provision in cities. Despite the enormous growth of populations in the developing counties, the development of basic urban services, particularly the provision of potable water seems to be lagging behind. Water is a fundamental need of humanity. The common saying that "water is life" may be an old saying, but it is indeed very valid. What is sometimes forgotten is that for hundreds of millions of people in the developing world the search for and obtaining of water can be a very difficult and time consuming exercise. In support to this, Rast (1996) reports that during the water decade (in the 1980s), on an average day 330,000 people in developing countries gained access to safe drinking water. This, as he further notes, is double the rate of provision in the seventies. The figures may look impressive, but for the rapid increase in urban population of the developing countries, which was about 200,000 per day during the water decade, about one in five urban residents in developing countries was still without adequate water supplies (UNCHS, 1996a).

Rakodi (1993) also recognises that the rapid growth of urban populations has obvious implications for the infrastructure and service needs of cities. She notes that the failure to expand services such as water supplies and sanitation systems, to match the growth in population, has been a leading cause of suffering in the cities of the developing world. To demonstrate the huge number of people that face this situation, UNCHS (1996a) estimates that around 30% of the developing world's urban population does not have access to safe water supplies. This figure rises to over 40% for countries in Africa. In terms of access to

proper sanitation, 40% of the developing world's population do not have access and, in the case of countries in Asia, this figure rises to over 50%. Table 2.4 gives an example of urban service indicators in 1980 for different countries in the developing world.

TABLE 2.4: Urban services indicators for different countries in the developing world in 1980

Country	**Water supply (1980)**		**Sanitation (1980)**		**Electricity (1970-80)**
	% of urban population served by:		**% of urban population served by:**		**% of urban dwellings with electricity**
	House connection	**Public connection**	**Sewer connection**	**Other system**	
Benin	10	16	0	48	
Burundi	23	68	8	32	
Egypt	69	19	45		77
Ghana	26	46	4	43	
Guinea	16	53	13	41	
Kenya	59	26	49	40	
Lesotho	24	13	10	3	
Libya	95	5	44	56	
Mali	20	17	1	78	
Morocco	44	56			82
Tunisia	71	29	46	54	
Mexico	62	2	49	2	
Panama	93	7	62		90
Argentina	61	4	32	57	
Bolivia	24	45	23	14	
Chile	93	7	69	30	
Peru	57	11	55	57	54
Uruguay	90	7	15	44	89
Philippines	53	12	1	80	63
Saudi Arabia	35	57	20	61	

Source: UNCHS, 1996a

As Table 2.4 shows, in Benin only 26% of the population had access to safe water in 1980. Regarding Lesotho, the table shows that only 24 % of the urban population is served by an in-house connection. This figure is significantly low when compared to that of other countries in the region.

Rakodi (1993) also comments that, whilst in some countries there may be some progress in providing satisfactory urban services for all, in a majority of developing countries the situation appears to be deteriorating. United Nations Foundations (2002) further estimates that, in 1985, about 25% of the population of towns and cities in the developing world still lacked access to safe water. This means that in 1985 the number of people that were not served with water increased by 100 million from the 1975 figures. UNCHS (1996a) adds that, in 1994, the number of people still unprovided with urban services in the developing world had increased significantly in comparison with that of the developed world. The report adds that, in the cities of the developing countries, only 50% of the population have piped water to their homes. About 25% get water from public standpipes, yard taps, protected wells and boreholes. The other 25% depend on water vendors or polluted open streams. Table 2.5 shows urban services coverage in developing countries in 1994.

TABLE 2.5: Urban services coverage in developing countries in 1994

Service	Population served	Population unserved
Urban water supply	1.32 billion	0.28 billion
Urban sanitation	1.01 billion	0.59 billion

Source: UNCHS, 1996a

The implication is that developing countries are faced with the enormous challenge of providing their people with urban services. Failure to do this can result in a catastrophe. This problem is made even more complex by the expanding population and the rapid urbanisation rates in the cities. This clearly shows that water is vital for agriculture, manufacturing, transportation, and countless other human activities everywhere on the planet. Water also plays a key role in shaping the earth's surface, moderating climate, and diluting pollutants.

2.4 RISK AND WATER RESOURCES MANAGEMENT IN URBAN AREAS

Risk management should always be given priority if the management of water resources is to succeed. However, it seems to be a factor that is often neglected when dealing with urban water supply and resources management. Global Water Partnership (2000a) recognises, relatively little attention has been paid to the orderly assessment of risk mitigation costs and benefits across the water use sectors and the consequent evaluation of the various risk mitigation options. The implication here is that, it is important that in dealing with water

provision and water resources management, the concept of risk management needs to be given attention if the water sector is to develop.

According to Rees (2002), risk management is in fact not a new concept as it has for a long time played an important role in the development of the water sector. This has been the case because water is a vital resource that is unequally distributed over space and time. Clarke (1993) recognises that ancient societies had developed very sophisticated water harvesting and management techniques to cope with the risk of supply irregularities and to allow crop production in areas prone to drought. In the same manner, there are various examples of societies who responded to flood hazards by developing control techniques.

In modern times, when population increase and increased demand for water have put pressure on the resource, the range and scale of water related hazards has changed (Rees, 2002). Rees (2002) further notes that the way professionals and the public have perceived the risks associated with these hazards and have responded to them had been a critical influence on the development of conventional water management systems. For example, the perceived need to develop supplies to meet all the requirements of different consumers, thereby reducing the risk associated with water shortage, has contributed to the poor provision practices, investment patterns, administrative arrangements and processes involved in water management. In the same manner, McDonald and Kay (1998) recognise that the public health risk created, not by natural hazards, but by human produced pollution, was a major influence in shaping supply methods for municipalities in the nineteenth century. The attitudes towards urban water provision engendered at that time remain with us today, and water provision is still often regarded as a public health and welfare service rather than as an enterprise producing an economic good.

However, in today's world it has become increasingly evident that current water management practices have failed to keep pace with the demands being placed on the resource (Rees, 2002). This has resulted in millions of people being at risk due to lack of clean water, and, as The United Nations Children Fund (1996) recognises, public health risks from inadequate sanitation affect 50% of the world population. Rees (2002) further notes that the number of

people at risk from floods and drought continues to rise, while at the same time risks from degraded ecosystems have increased alarmingly. Wetlands have been destroyed, over abstraction has lowered water tables and caused major rivers to stop flowing, and both ground-waters and surface waters have been highly polluted. Cosgrove and Rijsberman (2000) note that there is now a general agreement that the world is facing a continuing crisis in water provision, and this puts at risk the water system that we depend on for our survival on earth.

According to the World Water Commission (2002), through bad management practices, humans are the core problem in water resources management. A similar view is expressed by the Global Water Partnership (GWP) (2000b), which reports that the water crisis is mainly a crisis of governance. The report further notes that the present threat to water security lies in the failure of societies to respond to the challenge of holistically considering the various needs for and uses of water. The argument is that the currently unsustainable management practices must be replaced by a holistic approach based on the concept of integrated water resources management. According to the GWP (2000b), this is the only means of providing water security to the rapidly growing population, thus effective risk management, since it seeks to change current practices that endanger the sustainable development of the very resource upon which life depends.

2.5 THE IMPORTANCE OF URBAN WATER PROVISION

Water is a vital resource for sustaining life on earth. It is crucial for economic and social development, including energy production, agriculture, and domestic and industrial water supplies. Access to clean water has been proven to reduce the incidence of a variety of diseases (Cubbit, 1995; Bond, 1999; World Health Organisation, 1987). A reliable potable water supply can therefore be used as a major indicator of the level of local government and of community health, since many epidemic diseases are water-borne (Bergen, 1999) In general, an adequate, accessible and safe water supply is a prerequisite for improved public health and socio-economic development. According to United Nations Children Fund (1996), the use of unsafe water in the developing world is responsible for some 80% of diseases and 33% of deaths. There are already 1.2 billion people suffering from diseases

caused by drinking polluted water or transmitted by inadequate sanitation. Waterborne diseases also account for more than 4 million infant and child deaths per year in this region, while about 15 per 1000 children born die before they are 5 years old from diarrhoea caused by drinking polluted water. Although this information was not obtained for urban areas only it should be mentioned that these problems are usually more directly relevant to urban areas. The main reason is that the urban densities are higher than those in rural areas.

The following are some benefits that can be obtained as a result of improvements in urban water supply services:

Health benefits

Improved water supply contributes to reducing the mortality rate of children and to increasing life expectancy. Furthermore, it reduces the suffering and hardship caused by water related diseases, and results in significant benefits to individuals and society in general (McCoy, 2000). These benefits include:

- Savings in medical treatment, including the cost of medicines.
- Workdays and income saved by the sick as well as by relatives responsible for their care.
- Savings in travel costs and time required in obtaining health care.
- Increased productivity and extended life span.

Economic benefits

Improvement in water supply can produce the following economic benefits (see Bond, 1999; Rogerson, 2000):

- It reduces the time required to collect and transport water. This is particularly so in cases where women have to spend most of their time collecting water.
- It increases opportunities to engage in income earning activities, and therefore increased productivity.

Social benefits

Easier access to safe water can improve family and social development. For example, when women are freed from water collecting, they have more time not only to engage in income

earning activities, but also for other household tasks, as well as educational work (Budlender, 2000).

To demonstrate the importance of water provision and the benefits thereof, Kaylan (1996) cites the case of an outbreak of cholera that hit Lima, the capital of Peru in 1991, and describes the effects as very disastrous. He reports that it came as a result of poor water and sanitation facilities. The outbreak started in the capital, Lima and spread like a bush-fire over a wide area, moving from low income settlements across the city into wealthy neighbourhoods. The effects on the economy were devastating. For example, the fishing industry, which plays a significant role in the economy of that country, collapsed more or less overnight, with a loss of $1 billion in three months. Tourism also suffered a loss of $500 million over the same period, yet the amount lost in tourism and exports alone would have been sufficient to provide a decent water supply and sanitation system to the entire population at a cost of about $50 per household.

This epidemic could have been prevented, had adequate systems been installed in time. The effects on trade and tourism and the huge medical bills could have been saved, while the human suffering and loss of lives and thus loss of potential productive labour, could have been prevented. Similar problems to these can be found in many developing world cities. This is a situation brought about by rapid urbanisation that is not accompanied by proper planning of development. It is therefore clear that there is an increased challenge for city authorities to provide water and sanitation for all, and not just for those who can afford it, as the resulting problems affect the whole nation, not just the poor, as seen in the case of Lima.

2.6 AFFORDABILITY AND PAYMENT FOR SERVICES

2.6.1 Affordability

Water is the most important, but limited resource for human development. A reliable supply of good quality water is essential for almost all forms of economic development, including agriculture and industry, as well as for ensuring the continued existence of all human beings and the natural environment. Despite this importance, many people in the developing world

are still without adequate water supply because of the high price that has to be paid to get water.

Auclair (1999) defines the price of water as the average cost incurred per cubic meter of water in U.S. dollars. The price of water varies considerably and can constitute a significant proportion of total household income in areas where water is scarce and thus expensive. For example, during the dry season in urban Chad, water costs about $17 per cubic meter; it costs $10.50 in Botswana and $8 in Mauritania. The same quantity of water supplied in urban France and Germany costs $1.20 to $3.60.

Unfortunately, the development of urban water supplies has generally failed to keep pace with the rapid expansion of cities (Potter and Lloyd-Evans, 1998; Rakodi, 1993). This is partly due to the fact that water resources have often been undervalued. Water is seen as a free commodity provided by governments, and is subsidised by governments through general taxation. This has led to a false sense of security with respect to the value and availability of water. Furthermore, water subsidies tend to increase with increasing consumption, providing little incentive for individuals and corporations to be 'water wise', and to work towards conservation and protection of this vital resource. This results in water becoming more and more expensive for the poor while the rich enjoy high consumption at low costs.

2.6.2 Payment for services

According to Rakodi (1993), payment for services, particularly water provision services, is one of the major problems encountered by authorities in Third World Cities. The problem is often caused by lack of ability and or willingness to pay for services. This creates problems that ultimately result in the inability of responsible authorities to recover their operational costs and thus water supply fails to be self-sustaining. The above situation requires that close attention be paid to proper management strategies.

Katko (1989) and Kaylan (1996) further note that cost recovery policies can sometimes be unclear and that much attention should be given to customers' ability and willingness to pay for services. They argue that, even though the notion that water should not be provided free

of charge might be good, it should be noted that it does not take into consideration the fact that there may be a proportion of people or households which will not be able to afford even the minimum payment for water. This therefore places a challenge on water provision authorities to come up with a fair, yet financially sustainable payment system which balances their sometimes contradictory goals, namely, the need to provide water services to all; the need to maintain the financial viability of water supply systems, and the need to ensure that even the poorest have at least a sufficient supply of water to maintain their health and an acceptable standard of living.

Further criticism against the neo-liberal approach to water provision comes from Bond, Dor, and Ruiters (2000) who suggest that in order to achieve equity access to water services, governments need to adopt the lifeline tariff approach as opposed to the cost recovery approach in the pricing of water. This means that there needs to be a minimum allowable amount of water provided for free. This amount is what is considered to be sufficient for meeting basic human needs to enable access to those who cannot afford to pay even the minimum charge for water. The Asian Development Bank (2001) also agrees that, while it emphasises full cost recovery for sustainability in its water provision policies, there are circumstance where subsidies are absolutely necessary. These include cases where a limited quantity of treated water for the poor is regarded as a basic human need. It is only such circumstance that may justify a limited lifeline element in tariff policy.

Giles *et al*. (1997) emphasises that a key aspect of achieving the balance of cost recovery built into urban water supply systems is the ability and willingness of consumers to contribute to improved water supply services. The Palmer Development Group (1998) has conducted a study in the Johannesburg metropolitan area to ascertain the actual willingness and ability to pay for water services. Evidence from the study indicates that there is a widespread acceptance that there is no sense of entitlement to free urban services amongst informal settlers. Rather there is a widespread acceptance that water is not a free commodity and that payment is necessary. However, there are political issues involved that ultimately result in a difference between personal acceptance of validity of payment and the actual occurrence of

payment. The survey found an almost 100% agreement that payment for water provision was necessary, while the actual payment level was between 5% and 30%.

2.7 WATER UTILISATION

Consumption of water is defined by Bergen (1999) as the average amount of water used in litres per person per day. Different sectors of society use water for different purposes, including drinking, removing wastes, agriculture, industry and even energy production. The amount of water required for each of these activities can vary greatly in respect of climatic conditions, lifestyle, culture, tradition, diet and so on. However, an absolute minimum water requirement for humans, independent of their lifestyle and culture, can be defined as an amount only for maintaining human survival, that is for drinking, hygiene, sanitation and food preparation purposes. Table 2.6 illustrates a summary of the World Health Organisation (WHO) recommendation for basic water requirements.

TABLE 2.6: WHO recommended minimum water requirements for basic human needs

Purpose	Recommended minimum (litres/person/day)	Range (litres/person/day)
Drinking water	5	2 to 5
Sanitation services	20	0 to over 75
Bathing	15	5 to 70
Cooking and kitchen	10	10 to 50
Total	50	

Source: Water International, 1996

It must be noted that these recommendations are based on fundamental health considerations and on assumptions about technical choices usually made at moderate levels of economic development. Considering drinking water and sanitation needs only suggests that the total minimum clean water required for maintaining adequate human health is between 2 litres and 80 litres per person per day, or up to about 30 cubic metres per person per year. The low end of this range is an absolute minimum and reflects survival only. The upper end reflects a more complete satisfaction of basic needs using water piped directly to the house (Water International, 1996).

Gleick (1996) further suggests that governments and water agencies should provide an absolute minimum of 25 litres of clean water per person per day for drinking and sanitation. This amount is just above the lower end target of 20 litres to 40 litres per person per day set by the U.S. Agency for International Development, The World Bank and the World Health Organisation, each of which excludes water for cooking and cleaning. Adding water for bathing and cooking raises the total range to between 27 litres and 200 litres per person per day. This range encompasses the level of 100 litres per person per day recommended by the United Nations as typical household demand in water scarce regions.

2.8 GENDER AND WATER PROVISION

According to Water Year (2003), the International Women's day organisation is now calling for women from all over the world to coordinated efforts to expand women's rights and encourage their participation in the political and economic process. In 2003, the day's celebration highlighted the extreme importance of women's role in water management. Clones (1995) recognises that in many societies, particularly in Africa where the majority of developing world cities are located, water is at the core of women's traditional responsibilities. The report further notes that about 90% of the work of gathering water for the household is done by women. In the majority of the world's households, it is women who generally control and manage the use of water. They determine its use in household activities such as preparing food, washing clothes, and keeping the household and family clean. It is women who traditionally collect and carry home water in many places in the developing world. In countries in which women work on the land they are usually responsible for ensuring that there is sufficient water for crops and the animals in their care. These tasks often represent a whole day's work. For example, the Food and Agriculture Organisation (FAO) (2003) reports that 30% of women in Egypt walk over one hour a day to meet water needs. In part of Africa water collection can take up to 8 hours a day, while it can also involve young girls who attend school. However, the importance of the link between women and water often does not get enough recognition.

Wilderboer (1995) estimates that, by the end of the twentieth century, water availability per inhabitant in Africa will be 5100 cubic metres, which is one fourth of that of 1950. The report

also notes that the ever growing scarcity of clean and fresh water is bound to increase the present hardship of women. As individuals, women are the most directly affected by lack of water. They are the most directly concerned with water in the community, and have the greatest interest in a reliable and good quality urban water supply service. The FAO (2003) further indicates that poor access to water affects, not only women's production for the household and the amount of labour they must spend to collect, store, protect and distribute water, but also their health and that of their families. All types of water related diseases, especially waterborne, affect millions of poor people each year. Women are the ones who are forced to take care of the people who are ill and replace, with their labour, that of those who have fallen ill.

Daniel and Rast (1987), further recognise that, while women normally play the major role in managing the use of water at the household level, and in the community in some cases, they usually occupy a minor role in water resources assessment and in other activities related to hydrological services. Within the field of hydrology and other geophysical sciences, there are generally too few professional women, particularly at the advisory and policy making level.

It is only in recent years that gender analysis is being taken into consideration in the management of water resources. The FAO (2003) reports that it is now recognised that the exclusion of women from the planning of water supply and sanitation schemes is a major cause of their high rate of failure in most African states. Providing women with access to clean water close to their homes can dramatically reduce their workload, hence free up time for other economic activities. For young girls, this time can be spent in school.

Water Year (2003) further reports that, since the 1990s, more and more attention has been devoted to the relationship between women and the environment and, in particular, in relation to water. It cites the following examples as positive indicators;

- Agenda 21, the main outcome of the Earth Summit held in 1992 has a chapter on Global Action for Women towards Sustainable and Equitable Development.

- The Dublin Statement on Water and Sustainable Development (1992) includes women in one of its four principles; "Women play a central role in provision, management and safeguarding of water".
- The World Summit on Sustainable Development (2002) in Johannesburg has issued several commitments related to women in its Political Declaration, and has placed special emphasis on ensuring their participation and involvement in programmes of action at all levels. These commitments include the achievement of the Millennium Development Goal to reduce by half the proportion of people without access to safe drinking water by 2015; the development of integrated water resources management and water efficiency plans by 2005; the provision of support to developing countries in their efforts to monitor and assess the quantity and quality of water resources, especially through the establishment and or development of national monitoring networks and water resources databases and the development of relevant national indicators. Achievement of these commitments requires undertaking of a series of actions such as; mobilisation of international and domestic financial resources, transfer of technology, promotion of best practice and support capacity building for water and sanitation infrastructure and services development while ensuring that such infrastructure and services meet the needs of the poor and are gender sensitive; and facilitating access to public information and participation, including by women, in support of policy and decision-making related to water resource management and project implementation.

2.9 CONCLUSION

The above literature indicates that the availability of water both at global and national levels is very limited. This is particularly evident when one considers the high population growth rates that have occurred worldwide over the past three to four decades. The literature has also shown that most of the growth has been occurring in cities in the developing world, which are characterised by poor economic status. Provision of urban services, particularly water, is therefore one of the biggest challenges facing developing countries. The challenge here is to come up with the best policy guidelines for better water provision. Recognition and

promotion of the involvement of women in the water sector, due to their importance in water provision, is one of the strategies that governments should adopt.

The emphasis in Chapter Three shifts to urbanisation and the pressure on water supply in Lesotho, with specific reference to Maseru.

CHAPTER THREE: A HISTORICAL PERSPECTIVE ON URBANISATION AND WATER PROVISION IN LESOTHO WITH SPECIFIC REFERENCE TO MASERU

As already mentioned in Chapter Two, demographic change plays a vital role in all forms of development planning of a country. This is particularly so because demographic variables, such as population growth and urbanisation, change very rapidly with time. As argued in Chapter Two, increasing population and rapid urbanisation in Third World Cities pose a serious threat to the world's depleted water resources (United Nations Foundations, 2002). In Lesotho, like in many other developing countries, these variables seem to increase at an alarming rate while development in general, especially in the form of provision of services, is lacking. Rapid population growth coupled with rapid urbanisation, will result in an increase in the demand for water, and therefore a need to expand water supply systems. If this condition is not met, health standards could deteriorate. The use of clean water and recommended types of sanitation facilities can therefore limit the spread of diseases. Shortage of water can result in the spread of communicable diseases that can emerge as a result of the use of unclean water and unhygienic sanitation facilities. The aim of this chapter is to show the impact of ongoing changes, such as those brought about by population growth and urbanisation on water services provision in Lesotho, with specific reference to Maseru, the capital city.

Firstly, the settlement hierarchy together with population dynamics in Lesotho will be analysed. Then the statistics on population growth and urbanisation and how they have been changing over time will be looked at. This will be followed by a temporal assessment of access to water in Lesotho with specific reference to Maseru. Lastly, the chapter will discuss health aspects in relation to water provision. The outline for this chapter is illustrated in Figure 3.1 below.

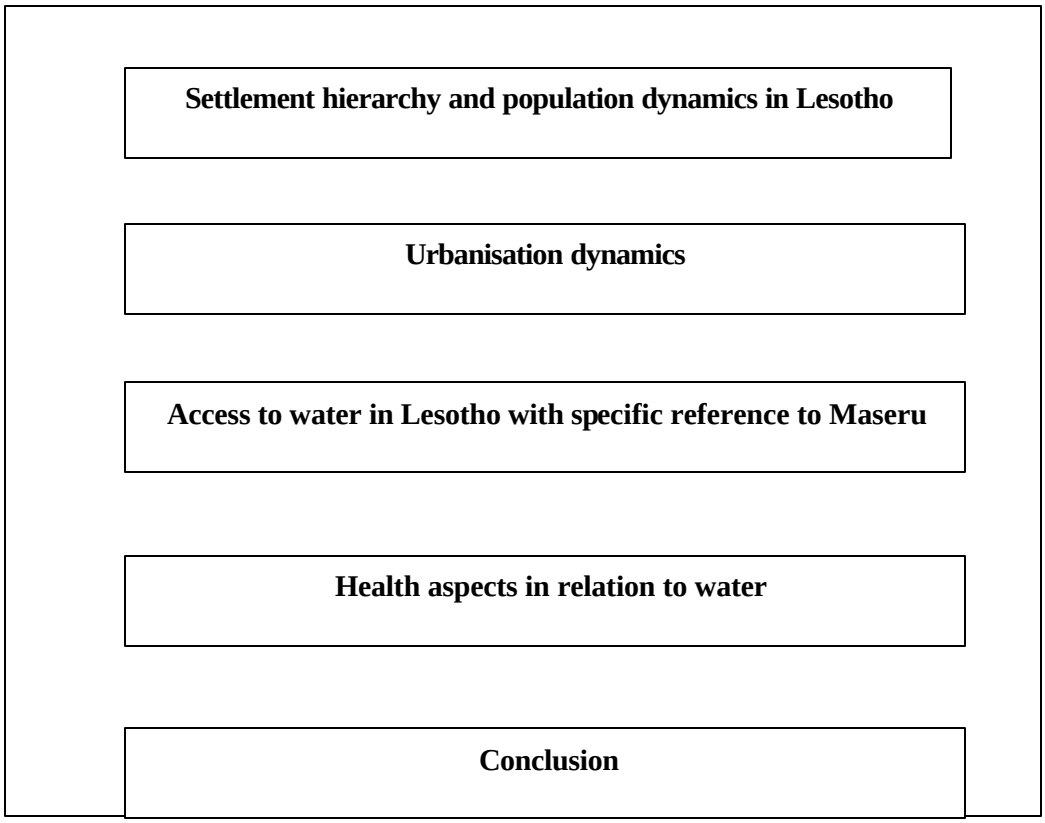

FIGURE 3.1: Outline of Chapter Three

3.1 SETTLEMENT HIERARCHY AND POPULATION DYNAMICS IN LESOTHO

Lesotho is divided into ten administrative districts, each of which has an urban centre. Marais (2001) identifies the following types of urban centres in Lesotho. Firstly there is the capital city, which is Maseru. The next level is that of regional centres, made up by the nine district urban centres. These are followed by specialised centres, which are areas within the districts with urban activities, but outside the district centres. At the lowest level there are the rural service centres, which are service provision centres in rural areas. This hierarchical arrangement of urban centres plays a vital role in the provision of services in Lesotho; the centres that appear highest in the hierarchical chain have been provided with the highest level of urban services and vice versa. As Marake (1998) observes, this was influenced by the population that each of the centres was serving. Urban centres that appear high in the hierarchy were the most populated and were therefore provided with the highest level of services and vice versa.

Recent trends of population growth, however, indicate that even the traditionally least populated areas have been experiencing such rapid population growth rates that they have already outgrown the current level of service. Projections from the Lesotho Bureau of Statistics (1996b) put Lesotho's population at 2.1 million with a growth rate of 2.1% per annum. The report further notes that although around 82.1% of the country's population still reside in rural areas, rapid urbanisation has been occurring in all the urban centres in recent years. This implies the need to refocus and provide urban services to these areas in order to serve the ever-increasing population.

According to Ambrose (1993), in the past hundred years the settlement pattern in Lesotho has undergone a series of changes, of which the most noteworthy is the progressive establishment of villages in the Maloti mountains (the mountains which form the Eastern three-quarters of Lesotho) from 1880 to 1910; a fairly uniform population growth between 1910 and 1965; and a movement away from the remoter areas to newly emerging unplanned peri-urban areas, and in particular Maseru, between 1965 and 1989. Ambrose (1993) further notes that within these periods there were attempts to combine scattered villages locally as a land conservation measure in the late 1940s, whilst in the 1965-89 period there was an enormous growth of new villages and an expansion of existing villages next to main roads. Wilkinson (1985) also explains that changes in the pattern of migrant labour, which allow migrant workers to return to Lesotho more frequently, have been a major factor in this new settlement pattern, and have also been a major factor in the growth of urban areas close to border posts. He notes that this is particularly so in major urban centres such as Maseru, where the extremely rapid population growth from 14 000 in 1966 to approximately 150 000 in 1989 has occurred partly as a result of this factor, and more especially as a result of the growth of government and external aid activities. The lack of decentralisation has led to major urban centres growing even faster than the rest of the country. The overall result of the transitions is that the majority of the country's population became located in the lowlands in the 1990s, and in 1996 they accounted for 58% of the country's population, representing a 10% increase from the 1986 census report (Ambrose, 1993).

It is evident that the rapid urbanisation that has occurred in the post-independence period in Lesotho was not accompanied by appropriate physical planning in the peri-urban areas, and has resulted in a settlement pattern of large areas of inferior dwellings and unserviced sites, which are also often relatively remote from public services. The Department of Land Survey and Physical Planning (1990) also identifies another settlement pattern in the rural areas of Lesotho that is largely characterised by small and scattered settlements as a result of high elevations, topographic depressions and broken terrain. This indicates that, generally, a common feature that is characteristic of all the settlement patterns in both the rural and urban areas of Lesotho is the high incidence of unplanned settlements that make the provision of infrastructure and services a very expensive and difficult task.

Chakela (1999) indicates that the spatial growth of settlements in Lesotho is characterised by uncontrolled urban sprawl directly linked to the national land tenure system. However, he points out that the only advantage of this sprawling pattern of urban development is its low-density as a majority of settled areas have a density of 1 to 10 persons per hectare. This indicates a more extensive and not intensive pattern of urban growth.

As the UNCHS (1996c) points out, this pattern of urban growth should in theory facilitate a healthy living environment. However, this is not the case in Lesotho because the sprawl of urban settlements is an uncontrolled process. The report further identifies the following negative factors associated with the uncontrolled urban sprawl:

- Difficulty in providing social services, particularly water and sanitation.
- Difficulty in providing recreational facilities.
- Encroachment of settlements onto prime agricultural land.
- Poor placing of settlement in relation to industry.
- Environmental degradation.

3.2 URBANISATION DYNAMICS

Marais (2001) recognises that the level of urbanisation in Lesotho is dependent on the definition that is used. This makes it difficult to calculate the level of urbanisation because what is viewed as rural today may be viewed as urban tomorrow or vice versa. Chakela (1999) defines urbanisation as a general term often taken to mean an increase in the proportion of people living in towns and cities and / or a shift in the occupational structure of the economy of a country or region from agricultural to non-agricultural activities. He further recognises that, in Lesotho, government proclamations seem to be the main factors in defining urbanisation. The Population Census Analytical Report (Bureau of Statistics, 1996a) on the other hand, defines urban areas as all administrative districts headquarters and other settlements of rapid growth, and with facilities which tend to persuade people to engage more in non-agricultural activities, while the Department of Water Affairs (1996) defines urban areas as families living in concentrated cluster settlements of 2 500 or more at a density of at least 1 000 per km^2 and engaged in modern activities with a minimum of land at their disposal. Marais (2001) reports that the latter two are the most commonly used definitions of urban areas in Lesotho.

Urbanisation in Lesotho is influenced by three main factors, namely rural to urban migration; natural increase of the urban population, and an increase or decrease in the number of settlements classified as urban (Chakela, 1999). According to the Bureau of Statistics (1996a), 86% of Lesotho's population lives in the rural areas and only 14% is urban based. The proportion of the urban population was recorded at 7.4% in 1966, 11.4% in 1979 and 14% in 1996. Table 3.1 illustrates the growth of urban population in Lesotho over the years 1976, 1986 and 1996.

TABLE 3.1: Population of urban centres in Lesotho in 1976, 1986 and 1996

Urban Area	1976	1986	1996
Maseru	65,031	107,536	137,877
Teyateyaneng	8,589	12,934	48,869
Mafeteng	8,287	12,171	20,804
Maputsoe	15,823	10,577	27,951
Butha-Buthe	7,472	8,340	12,611
Hlotse	6,297	8,076	23,122
Mohale's Hoek	5,276	7,675	17,871
Qacha's Nek	4,837	4,595	4,797
Quthing	3,528	4,306	9,858
Mokhotlong	1,484	2,394	4,275
Thaba-Tseka	4,427	2,149	4,449
Total	**131,051**	**180,753**	**312,484**

Source: Bureau of Statistics, 2003

As the above table indicates, most of the towns in the lowlands, namely Hlotse, Maputsoe, Mafeteng and Teyateyaneng, have shown significant growth, but Maseru, the capital city, has been absorbing the largest share of the urban population. As noted in Chapter One, the city's population is growing at a rate exceeding 7% per annum in some areas, and accounts for 36% of the total urban population of Lesotho (Chakela, 1999; Bureau of Statistics 2003). The Bureau of Statistics (2003) further notes that the estimated urban growth rate over the period 1976-86 was 4.3% per annum, which was far greater than the natural population growth rate of 2.35%.

To support the above figures, The Maseru Development Plan (1991) also reports that Maseru had a population of 55 000 in 1976. By 1986, this had grown to 109 000, thereby representing an annual growth rate of about 7% and doubling of the population size over a period of ten years. The report further notes that, urban population projections show that, by the year 2010, the city of Maseru should have a population of well over 300 000 at moderate growth, (7% up to 2000 and a gradual reduction to 3.5% by 2010) or close to half a million if the current annual growth rate of 7% continues. Table 3.2 shows the projected population of Maseru from year 2000 to 2025.

TABLE 3.2: Projected population growth of urban Maseru, 2000 - 2025

Year	Population
2000	265,000
2005	342,000
2010	454,000
2015	599,000
2020	782,000
2025	1,010,000

Source: TAMS, 1996a

As the table shows, projections put the city's population at well over a million by the year 2025. It must be noted that the figure is about three times more than that of 2005, which is almost the current city population. This undoubtedly poses a challenge to urban city planners regarding the availability of infrastructure and services, especially if one considers the fact that Maseru already constitutes a higher percentage of the total urban population.

Chakela (1999) notes that rural to urban migration has been a very significant factor in the urbanisation process in Lesotho. A push factor that could have mainly influenced this movement is that the majority of rural dwellers depend solely on agriculture, which is usually supplemented by migrant worker remittances. However, in recent years, agriculture production has declined due to several factors including poor soils, changing climatic conditions and unimproved farming techniques. Migrant labour remittances have also been declining due to increasing levels of retrenchment in the mines of South Africa (Molapo 1998). These are some of the factors that have consequently resulted in high levels of rural - urban migration and ultimately high population growth rates in the urban areas.

The existing population growth has already and will certainly continue to pose a major challenge to urban infrastructure provision in urban Lesotho, and more specifically Maseru. The next section will indicate that water provision is already not copying with the demand.

3.3 ACCESS TO WATER IN LESOTHO WITH SPECIFIC REFERENCE TO MASERU

3.3.1 Access to water in Lesotho

Up to now this chapter has analysed the settlement hierarchy as well as the population and urbanisation dynamics in Lesotho. The emphasis now shifts to the processes of water access in Lesotho with specific reference to Maseru. As Chakela (1999) points out, the availability of water has historically strongly influenced the pattern of settlement in Lesotho. The widespread availability of perennial springs, arising from the relatively high levels of rainfall and the mountainous terrain, has contributed to a more dense settlement pattern along the mountain foothills, when compared to the low-lying areas of minimum rainfall towards the western border of the country.

Generally, Basotho (inhabitants of Lesotho) never made extensive use of surface water found in rivers and dams for household purposes, nor were they engaged in the digging of shallow wells, due to the fact that supply was met through the use of springs. The springs were in fact traditionally used for drinking purposes, while rivers were mainly used for washing and bathing purposes as well as watering animals. As a result almost all villages established before the introduction of borehole technology, have at least one spring that supplies water throughout the year. The introduction of boreholes has actually made it possible for settlements to expand into more arid parts of the country, populating areas which might not have been occupied (Chakela, 1999).

Overall, the Basotho have regarded water as a valuable and readily available resource that is a free gift from God as they often call it (Chakela 1999). It must be noted, however, that this situation of an essentially rural population with an abundant supply of water has changed remarkably over the years. A major factor that has influenced the change is urbanisation, brought about by rapid population growth and by migration from the mountain areas to the lowlands (see Section 3.2). This has resulted in the need for government intervention in supplying water to both the rural and urban population, which in turn resulted in investments in water resources development, a process that has made water a costly resource that can no longer be seen as a free gift.

Two public authorities are responsible for provision of water in Lesotho, namely the Water and Sewage Authority (WASA), which is responsible for water provision in urban areas, and the Department of Rural Water Supply (DRWS), which is responsible for supplying the rural areas. It must be noted, however, that boundaries between DRWS and WASA's responsibilities are not clearly defined, resulting in the former providing services within peri-urban areas of centres for which WASA is responsible. TAMS (1996a) clarifies that WASA has the responsibility to supply water services in Maseru and fifteen other gazetted urban centres in Lesotho. In those areas that do not receive the services of WASA, DRWS has to provide water. Although DRWS's responsibility is to serve the rural areas, the organisation is also providing services in areas that are today legally defined as urban areas, as well as the peri-urban areas of Maseru. This situation has occurred primarily as result of a lack of definition of 'urban areas', as discussed earlier (see Section 3.2).

These two water authorities have not managed to provide sufficient potable water. The Bureau of Statistics (2002) reports that only 32.3% of Lesotho's total population had access to piped water in that year, while the remaining percentage obtained their drinking water supply from other different sources. Table 3.3 compares the distribution of households by main source of drinking water in Lesotho in 1986 and 1996.

TABLE 3.3: Percentage distribution of households by main source of drinking water in Lesotho in 1986 and 1996

Main source of drinking water	**Total % (1986)**	**Total % (1996)**
Piped water	32.3	51
Catchment tank	0.6	1.4
Boreholes	12.6	0.3
Springs	52.6	44.4
Rivers	1.9	0.8
Other	0	0.1

Sources: Bureau of Statistics, 1996b

As indicated in Table 3.3, comparative data from the 1996 census data indicate an increase in water accessibility as 51% of the total population had access to piped water. The Bureau of Statistics (2002) further reports that the majority of households in all the districts draw water from piped community water supplies. On average, very few households in the

country draw drinking water from sources that are classified as environmentally unsafe, such as uncovered springs and rivers.

TAMS (1996b) reports that WASA is supposed to provide water services to a population of around 350 000 living within its area of designation, but the authority is currently serving approximately 50% of the population. TAMS (1996a) further notes that there is a total of approximately 20 000 water supply connections, and these include about 17 000 domestic connections and an extra 3 000 commercial and government connections, of which about 420 are public standpipes that provide free water to around 18 000 urban households. According to WASA (2002), one of the major policy objectives of the authority is to ensure expansion of the authority's customer base, and as TAMS (1996a) reports, this is in accordance with a Lesotho government manifesto of commitment to universal access to water. TAMS (1996a) further recognises that, despite this commitment, WASA has generally not been able to significantly increase coverage in its market areas. For example, in 1992 the authority served, through house connections, about 24% of the total population, and a further 35% were serviced through standpipes, resulting in a total coverage of 59%. In 1995 coverage through house connections had only risen to 26% of the population. This, as TAMS (1996a) reports, was a result of the slow rate of new connections and rapid population growth in the area of designation. Another factor was the disconnection of supply services due to late or non-payment. The total coverage in WASA is presently estimated at 55%, a lower figure than that of 1992 (Khotle, 1995).

This section provided a background on water provision mechanisms and their availability in Lesotho. Although some overall progress has been made with water provision in Lesotho, it seems as if no significant progress has been made with regard to water provision in Maseru over the last two decades. The focus now shifts to water provision in Maseru.

3.3.2 Access to water in Maseru: a historical overview

Ambrose (1993) provides an excellent overview of the history of water provision in Maseru. Other reports that reflect on this history are Parkman Consultants (2003) and Sechaba Consultants (1997). Parkman Consultants (2003) recognises that, a centrally organised

water supply to Maseru dates as far back as the Second World War, when the capital's population was assessed as only 3000 persons. According to Ambrose (1993) and Parkman Consultants (2003), springs were major sources of water in Maseru for the first few years after it was founded in 1869. Located on the Berea Plateau at Lancer's Gap, the springs had a production capacity of only 112 kilolitres daily. They soon proved insufficient, and water had to be transported by cart from the Mohokare River for household purposes. Sechaba Consultants (1997) further reports that in 1892, the first piped water supply came into being. It appears that water was obtained from springs on the side of the hill on which the Lesotho Sun Hotel is located today. The water supply was not sufficient for long, and in 1898 a further piping system was established. This system was using the springs at Lancers' Gap, to the East of Maseru. In 1904 a reservoir with a capacity of 300 000 gallons was built where the main Government offices block is today. Its daily water supply was 10 000 gallons which was used for human consumption and for watering animals. The town population at that time was 1750 (Ambrose , 1993 ; Sechaba Consultants, 1997).

Ambrose (1993) further reports that in 1906, the Lerotholi Industrial School opened in Maseru. Its opening was to play a major role in the history of water supply in Maseru, as it provided workforce to assist in the design, construction and maintenance of water supply works in Maseru. Sechaba Consultants (1997) adds that Pumping of water from the Mohokare River for the first time took place immediately after the opening of the school. Around 1906 pumping was already taking place. Water was pumped into another new reservoir, which is still in existence today. It holds about 200 000 gallons of water and is located to the west of Maseru. The plant consisted of a suction gas engine and a pump, capable of delivering 10 000 gallons of water per hour.

Distribution pipes were laid from the reservoir throughout Maseru to supply all gardens with water for irrigation purposes. A charge was introduced for the water and the project was considered a big success at the time. Two more reservoirs were built to the south-east of Maseru a few years later, and they are still in use today (Ambrose, 1993).

Ambrose (1993) further notes that despite the increased capacity of the water supply system, the use of water needed to be restricted in order to maximise the supply. Around 1923 as noted by Sechaba consultants (1997), meters were installed in Maseru for the first time, and this resulted in customers becoming more economical in using water.

After a serious drought that stopped the flow of the Mohokare River for a short period in 1948, a major development was undertaken to increase the capacity of the three reservoirs around Maseru. Consequently it was increased from 498 000, gallons which was reported to be sufficient for five days of normal summer requirements at the time, to about 4 million gallons. This was done by the construction of a 3 500 000 gallon riverside reservoir which is also still in use today. A pumping, filtration, and chlorinating station was also established which was capable of purifying around 185 gallons a day. At the same time, an upper reservoir of 300 000 gallons was built on the hill to the south overlooking Maseru (Ambrose, 1993; Sechaba Consultants, 1997).

Ambrose (1993) further reports that in 1949 a new reticulating system was installed so that there was one supply to each household and not two, as had always been the case since introduction of river water supply for gardens in 1917. The spring supply at Lancers' Gap was still very important to Maseru, especially during drought periods when the Mohokare River ran dry. Several improvements were introduced to that system over time, such as a series of small dams in the pass, and water development to the south in an area where the activities gave their name to the village of Lipompong (a place of pipes). In 1950 a slow sand filter plant was established, with a maximum capacity of 810 kilolitres per day.

In 1960, as Ambrose as noted in Amrose (1993) the Mohokare River water supply works supplied a record output of 47 794 000 gallons. In so far as periods of peak demand are concerned, the plant for drinking water had reached maximum limit for its capacity. During that year another major construction work took place. A 4 inch main, 5 200 ft long, was constructed to the south of Maseru. The total sales of water for the year ending 31 March 1960 showed an increase of 14% over the previous year. In 1961, water reticulation was extended to serve a new suburb north-east of Maseru. At the same time another area of

housing for government employees next to the railway station was reticulated (Sechaba Consultants, 1997).

After independence, the rapid growth of Maseru necessitated some major developments to enhance water supply and therefore the Sebaboleng reservoir, north-east of Maseru, was constructed in 1966. This had a capacity to supply 3 mega-litres per day (Parkman Consultants, 2003; Ambrose, 1993; Sechaba Consultants, 1997). Sechaba Consultant (1997) further reports that around 1974, the slow sand filters were replaced with faster gravity fed filters for the first time. These were able to produce an increased capacity of 4.5 mega-litres per day. In 1983 the much larger Maqalika dam was constructed downstream of the Mejametalana catchment area and it overflowed for the first time in 1986. However, it was only in 1989 that a major water treatment works extension was opened. With the extension, the purification capacity of the plant was further increased to the present 28 mega-litres per day on average (Sechaba Consultants, 1997). TAMS (1996a) notes that during this time water supply services still fell under the Department of Water Affairs through its Water Branch. In 1992 as TAMS (1996a) further notes, WASA was established with responsibility for all functions associated with water supply in Maseru and fifteen other urban centres in Lesotho. These functions include:

- Raw water supply
- Transmission
- Treatment
- Storage
- Distribution
- Billing

Sechaba Consultants (1994) reports that only in Maseru, WASA has a customer population of approximately 200 000, which is about 57% of the total population living within its area of designation. The authority currently serves about 100 000 people, about half of its customer population in Maseru. Safe drinking water is provided through over 10 000 connections plus approximately 120 public standpipes and, as the Bureau of Statistics

(2003) recognises, in the Maseru urban area at least 80% of households, about 90 000 households, have potable water at least within 200 metres.

The implication here is that efforts have been made over the past years to expand water supply systems in urban Maseru in order to cater for the needs of the increasing population. However, it has become apparent that these have not been sufficient as a significant proportion of the population is still without service. This, in turn, implies inefficiency on the part of WASA.

3.4 HEALTH ASPECTS IN RELATION TO WATER

In Chapter Two some attention was devoted to the health advantages of water supply. This section attempts to broadly reflect on existing research on the health aspects in relation to water provision in Lesotho. Access to clean water is essential for good health, and this is basically the aim of all institutions involved in water provision services. According to the Ministry of Health and Social Welfare (1996), Lesotho is very fortunate as it is free from many water related diseases found in other developing countries, particularly African countries. It is the only African country that does not have a prevalence of diseases such as malaria, sleeping sickness and other diseases commonly found in Africa. However, water-borne and water related diseases are a major problem that poses a threat to good health in the country due to the use of low quantities and the quality of water (Ministry of Health and Social Welfare 1996; TAMS 1996a).

It is worth mentioning, as TAMS (1996a) recognises, that while the relationship between clean water and health is recognised, very little formal monitoring and documentation of the health impact of water supply has been undertaken in Lesotho. This results in data on this issue being very difficult to obtain. Despite this limitation, Chakela (1999) identifies four categories of diseases associated with water, as follows:

- Water-borne - when water acts as a passive vehicle for the infection agent;
- Water-washed - when infections increase due to decreased quantity of water used;
- Water-based - when water becomes a necessary part of the life cycle of the infection agent;

- Water-related - when water becomes a breeding environment for insects that spread infections.

Chakela (1999) further explains that, given the nature of Lesotho's environment, the first two categories are the most significant, and Table 3.4 presents incidences of common water-borne diseases reported in hospitals in the urban areas of Lesotho.

TABLE 3.4: Common water-borne diseases reported by hospitals in urban areas of Lesotho between 1990 and 1994

Disease	1990	1991	1992	1993	1994
Typhoid	143	188	555	716	477
Diarrhoea without dehydration	1 190	1 281	1 577	1 075	1 032
Diarrhoea with dehydration	3 451	3 630	4 692	4 544	2 576

Source: Ministry of Health and Social Welfare, 1996

The Ministry of Health and Social Welfare (1996) reports that diarrhoea cases, with and without dehydration, are manifestations of the same disease, but the former represents a more severe condition. There seems to be an increasing trend in the incidence of diarrhoea with dehydration, a clear indication that a significant proportion of the population lacks access to clean water, and that the quality of water available to the urban population is poor.

As far as environmental degradation is concerned, Chakela (1999) identifies overflowing septic tanks and ruptured sewage systems as a common sight in the urban areas of Lesotho. These effluents pollute the water that is used for domestic purposes and these in turn result in water-borne diseases. The Ministry of Health and Social Welfare (1996) identifies diarrhoea, stomach ache and vomiting as the most prevalent water borne diseases. The report further explains that the high incidences of these diseases should be expected since a significant number of people, especially in the rural areas, are still drawing their water from unprotected springs.

Chakela (1999) also recognises that the occurrence of water related diseases is directly related to the type of sanitation facility used. The absence of a toilet within a community becomes disastrous in terms of the levels of faecal contamination of water. He explains that an ordinary toilet alleviates the level of water pollution by nearly half, while a properly

constructed and well ventilated improved pit latrine has shown to be even more effective in alleviating levels of water pollution, as illustrated in Table 3.5.

TABLE 3.5: Occurrence of water related diseases (%), by type of sanitation facility in urban areas of Lesotho in 1994

Facility	Diarrhoea	Stomach -ache	Vomiting	Worms	Skin problems
No toilet	43.5	49	44.4	61.1	44.8
Ordinary latrine	29.3	26	23.8	33.3	27.6
Improved latrine	24.5	23.5	28.6	5.6	24.1
Flush toilet	2.7	1.5	3.2	0	3.4

Source: Sechaba Consultants, 1994

As the table shows, the occurrence of water related diseases is highest where there is no sanitation facility, and lowest where there is an improved sanitation facility.

3.5 CONCLUSION

Lesotho is going through some major population shifts that will increase the future demand for drinking water. High levels of population growth coupled with high levels of urbanisation are major factors that are threatening the supply of water in urban areas of the country. The trend is similar to that experienced internationally (see Chapter Two). Failure to meet this demand for water, can impact negatively on the health of the population. At present it does not seem that WASA is providing water at a rate equal to the urbanisation rate in the country. One can conclude therefore that, contrary to increasing demand for water due to population increase and rapid urbanisation, it seems that the Maseru urban water supply did not increase. Having provided an understanding of the urbanisation trends and need for water supply internationally (see Chapter Two) as well as in Lesotho and Maseru (Chapter Three), the focus in the next chapter, which is Chapter Four, shifts to aspects of water policy in Maseru.

CHAPTER FOUR: WATER POLICY IN LESOTHO WITH SPECIFIC REFERENCE TO URBAN MASERU

Due to rapid urbanisation, natural population increase and thus increased population densities (see Chapter Three), there has been a need for government intervention in supplying water to both the rural and urban population in Lesotho. The Government of Lesotho is thus committed to providing clean water to all Basotho as one of its social objectives (Ministry of Finance and Economic Planning 2000). The question that one asks is whether the government intervention has really facilitated access to water for all. There are several policy issues that need consideration before one can respond to the question. It is therefore, against this background that this chapter aims to give an outline of the water supply policy in Lesotho with specific reference to the urban parts of Maseru. In order to do this, firstly, policy on water affordability will be discussed. This will be looked at in both urban and rural areas to enable a comparison of the two, and therefore a clear understanding of urban water supply. The tariff structure for urban water supply will also be looked at. Secondly, an examination of the subsidisation policy on urban water provision will be done. This will be followed by a discussion of policy assumptions on the willingness and ability of people to pay. Next will be a discussion of the problems associated with water provision, such as payment for services. This will be followed by an assessment of the quality of water produced by WASA and the potential hazard of poor quality water. Lastly, the technical process of domestic water production will be looked at. Figure 4.1 below illustrates how this chapter is outlined.

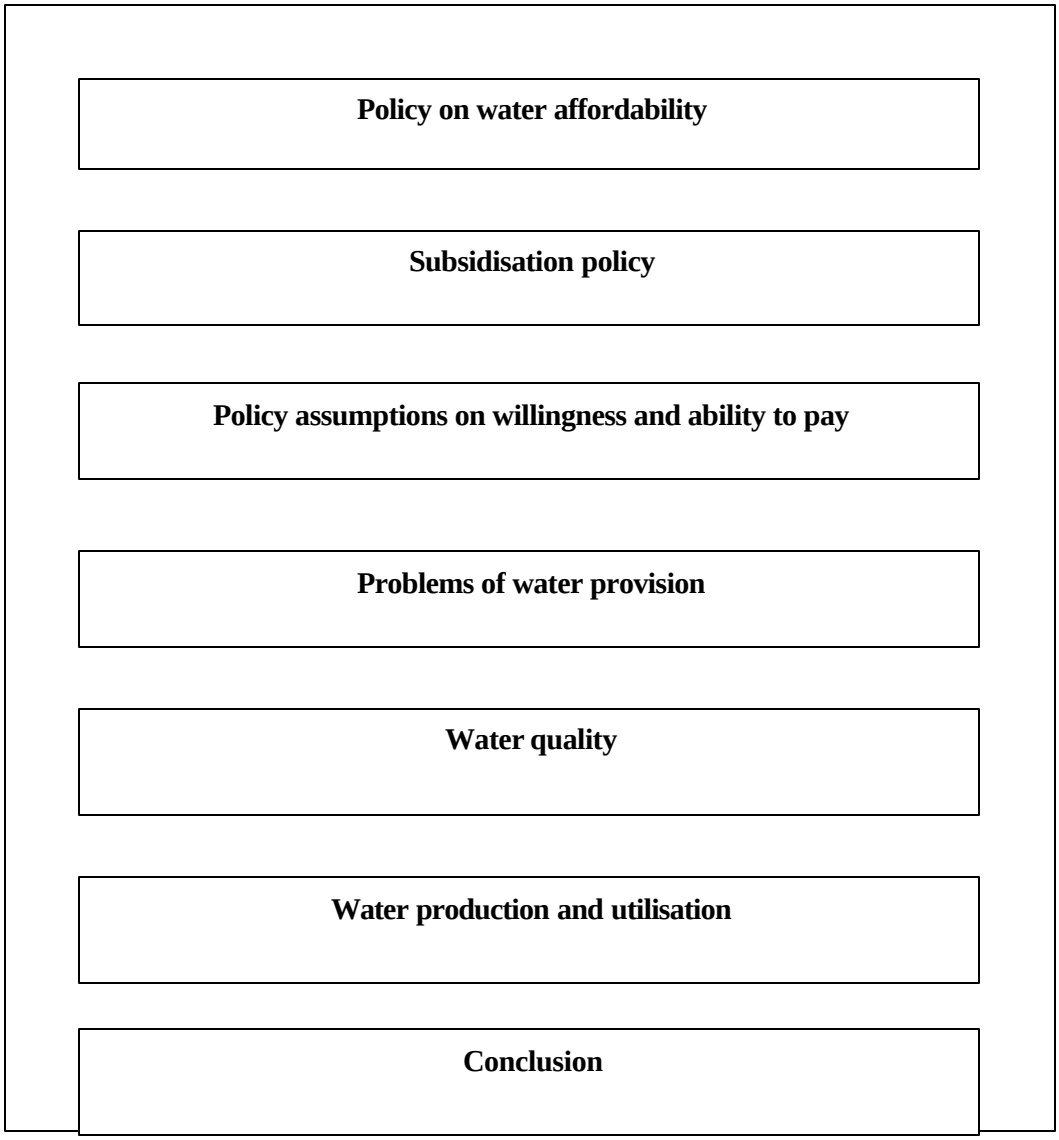

FIGURE 4.1: Outline of Chapter Four

4.1 POLICY ON WATER AFFORDABILITY

In Chapter Two the affordability of water was discussed in the international context and it was identified as one of the major factors that influence the availability of water. In order to regulate the affordability of water and to enable its availability to all, the government of Lesotho formulated two bodies that are responsible for water supply, namely the Department of Rural Water Supply (DRWS), in rural areas, and the Lesotho Water and Sewage Authority (WASA) in urban areas.

4.1.1 Background on rural water supply

Although the aim of the study relates to water provision and policy in Maseru, a broad understanding of rural water supply is deemed necessary. The main objective of DRWS, as TAMS (1996a) puts it, is to contribute sustainably to the well-being of the rural population by providing it with safe drinking water. Funding for DRWS comes from both the government and donors. TAMS (1996a) further identifies three key areas that are central to the policies and strategies of DRWS, namely community participation, choice of technology and operation and maintenance of supply systems.

Firstly, community participation implies that communities should be involved in all the stages of development of a supply system. The Government of Lesotho recognises that the contribution of the community is most important in the construction phases as they demand labour. The task of mobilising labour remains the responsibility of the concerned community, while DRWS provides material and skills. Villagers are also expected to contribute to a fund that will be used for maintenance and minor repairs. In cases in which there is no reliable natural spring, a pumped system is installed for free, but prior to this, the community is likewise expected to contribute to a fund for purchasing fuel to keep the system running. DRWS reports that it serves communities of around 200 to 3000 members and provides its services in response to demands from communities. Only communities that have been able to meet the above-mentioned criteria are served.

Secondly, it is also DRWS policy that the choice of technology should be appropriate in regard to low operation and maintenance costs. This is to ensure sustainability of the system in terms of management and maintenance.

Thirdly, it is also DRWS policy to provide the standard level of service in terms of the quantity of safe drinking water and of the distance to the collection point, irrespective of the type of system installed. DRWS also adopts the recommended international standard of 30 litres per capita per day at a maximum distance of 150 m (see Chapter Two).

4.1.2 Background to urban water supply

Having provided a broad overview of rural water supply the emphasis now shifts to urban water supply. In the urban and peri-urban areas of Lesotho, WASA is currently the sole provider of reticulated water. According to WASA (1996a), the authority was created in 1992 as a parastatal. It is responsible for the supply of water services in Maseru and in fifteen other urban centres in Lesotho. The report further mentions that WASA provides services only within its demarcated area of operation. This is unlike the case of DRWS which is flexible enough to extend its services even to the peri-urban areas, especially in Maseru, where in effect WASA should provide services. This is caused by the slow rate at which WASA is expanding into these areas.

4.1.3 WASA tariff structure policy

According to TAMS (1996b), in general, WASA's financial performance has deteriorated each year since the organisation has come into existence. Some of the major factors that cause the decline include a drop in the ability to recover costs, slow revenue growth, failure to control costs and slow rate of expansion. TAMS (1996b) further recognises that, in 1997, WASA's projected revenue could only cover operating costs, and there was no indication of profit or income being generated for further capital investments to extend the existing water coverage. As the report points out, this is mainly a result of a decline in real tariffs due to failure to control costs.

TAMS (1996b) reports that, since its establishment in April 1992, WASA has not been able to change its tariffs regularly, as government has not approved any attempts to increase tariffs. As has been mentioned, this resulted in the inability to effectively deliver water services and to expand coverage, because of a lack of financial resources. TAMS (1996a) reports that it was only in 1993 that a small increase of 4% was introduced. From 1992 to 1993 all domestic customers at WASA were charged M1.56 per m^3 / month, with an M10 minimum charge of per month, while industrial and commercial users were charged M3.12 per m^3 / month, with a minimum charge of M78 per month. In 1993 a 4% increase was

added to the charges (TAMS, 1996a). As can be seen, this tariff increase was too low to have a substantial effect on the financial performance of WASA. In June 1996 a fairly substantial tariff increase was introduced. A fixed standing charge of M2.00 per month was introduced for domestic users. The additional volumetric charge is illustrated in Table 4.1 below.

TABLE 4.1: Urban water tariff structure in Lesotho, 1996

Category	Consumption per month (m^3)	Charge (M)
A	0 – 5	1.56 per 1000 litres
B	6 – 10	2.34 per 1000 litres
C	11 – 23	3.12 per 1000 litres
D	>23	5.00 per 1000 litres

Source: WASA, 1996b

As the table indicates, with the 1996 increase, a consumption of between 0.1 m^3 to 5 m^3 per month was charged M1.56 per 1000 litres of water consumed together with the M2.00 per month standing charge. For a consumption of between 6 m^3 and 10 m^3 per month, the charge would increase to M2.34 per 1000 litres, with a M2.00 standing charge. Similarly for a consumption of between 11 m^3 and 23 m^3 per month, the charge was M3.12 per 1000 litres consumed, plus the M2.00 standing charge. For any consumption above 23 m^3 per month the charge was M5 per 1000 litres, plus the M2.00 standing charge. As the table shows, the charge would increase as the volume of water consumed increased. The purpose here was to increase charges, particularly in the higher user categories, so as to ensure that high consumers pay for the water that they use. On the other hand, this tariff structure greatly benefited the poor who, because of their situation, could not afford to install private systems. The poor fall within the A category and therefore because of their low consumption, they paid very low amounts of money. This was one of government's efforts to provide water services to all.

However, according to an interview with WASA officials, it was reported that even this pricing of water was generally based on the Government's perception of what is affordable or bearable by public, and did not necessarily consider cost recovery. One can conclude therefore that the 1996 tariff increase could not significantly improve the financial status of

WASA. WASA (1996b) further recognises that before the introduction of the June 1996 tariff increase, some domestic consumers were actually paying more while others were paying less than their consumption, as a standard charge that was not based on the amount of water consumed was used. TAMS (1996a) further recognises that, the cost for water supply on the side of WASA was somewhere between M3.6/m^3 and M4/m^3. The implication being that before the introduction of the tariff increase, everyone must have been receiving water at below cost. After the tariff increase some high consumption users paid the full price plus a mark up for all water over 23m^3 per month that they use. In September 2001 another tariff increase was introduced and was in place for three years. The standing charge for domestic users was M2.40 per month. The volumetric charge is illustrated in Table 4.2 below.

TABLE 4.2: Urban water tariff structure in Lesotho, 2001

Category	**Consumption/month (m^3)**	**Charge (M) per 1000 litres**
A	0 - 5	1.56
B	5.1 – 10	2.61
C	10.1 – 23	4.37
D	>23	6.50

Source: WASA Public Notice, 2001

As Table 4.2 indicates the new rates were particularly focused on the high consumer categories. The charge has remained constant in the consumption category of 0 m^3 – 5 m^3. It was increased from M2.34 to M2.61 per 1000 litres consumed for consumption between 5 m^3 and 10 m^3 per month and from M3.12 to M4.37 per 1000 litres for consumption between 11 m^3 and 23 m^3. For any consumption above 23 m^3 per month, the new rate was M6.50 per 1000 litres. For every category a standing charge increase from M2.00 to M2.40 was also added.

Interviews with WASA officials further revealed that since the introduction of the above tariff increase the Authority has been able to recover at least its operating costs. However, due to inflation increase, another new tariff increase was introduced in April 2004. WASA hopes that with the introduction of this new tariff structure, the authority will be able to

achieve financial viability. According to this tariff increase the rates for water are calculated as follows. The standing charge for domestic users is M2.61 per month. The volumetric charge is illustrated in Table 4.3 below.

TABLE 4.3: Urban water tariff structure in Lesotho, 2004

Category	Consumption per month (m^3)	Charge (M) per 1000 litres	
		Old rate	New rate
A	0 – 5	1.56	1.70
B	5.1 – 10	2.61	2.83
C	10.1 – 23	4.37	4.75
D	>23	6.50	7.06

Source: WASA Public Notice, 2003

As the table shows, users in the A category which is the low consumption category are charged an extra 14 cents from M1.56 to M1.7 per 1000 litres consumed. The charge increases from M2.61 to M2.83 per 1000 litres in category B and from 4.37 to 4.75 per 1000 litres in the C category. In the last category D, the cost increases by 56 cents from M6.50 to M7.06 per 1000 litres consumed. As it can be seen there has been a significant increase in the prices as compared to that of 2001, and the increase has been comparatively high in the high consumer categories.

As it can be seen there has been an apparently contradictory policy that aims to provide services at affordable rates for the poor and at the same time achieve full cost recovery, and therefore ability to expand. From the above calculations, one can conclude that this policy has not been able to achieve neither of the objectives, but instead has benefited the high income users who in my view are the ones who can sustain the burden of full cost recovery.

4.2 SUBSIDISATION POLICY

4.2.1 Justification for payment of water

Those who advocate for free water provision often put forward the argument that water is an abundant resource in Lesotho. This is probably a valid argument as it is unjustifiable to charge someone for drawing water from a natural spring or a river. The problem as Chakela

(1999) recognises, is that as a country like Lesotho advances, people are less willing to draw water from rivers and springs, instead they want water to come to them. Furthermore, as The Southern African Development Community (SADC) (1996) observes, in periods of drought when springs and rivers run dry, people still want water. Even people living in drier parts of the country where springs are not a reliable source of water, still look to the Government for help. Generally people want a reliable supply of water, delivered within close proximity to their households. This is one of the major objectives that the government of Lesotho is trying to achieve.

In order to achieve this objective, a number of activities are carried out such as, drilling and pumping of bore-holes, construction of dams, construction of water distribution systems, treatment services as well as maintenance and management of all this services. This will finally result in a water provision system that is reliable and convenient as desired by the consumers. However, all these services are costly and have to be paid for, but because Government realised that some consumers cannot afford to pay even the minimum charge for water, the subsidisation policy was introduced.

4.2.2 The subsidisation process

According to the interview with WASA officials, it was reported that the WASA tariff structure for domestic users is in such a way that it tries to ensure that the pricing of water is made affordable to low volume users, that is those in the consumption categories A and B as indicated in Tables 4.1, 4.2 and 4.3, which the authority considers as reasonable consumption for domestic purposes. Higher consumption according to WASA, of above $23m^3$ per month is considered luxury use and is therefore heavily charged comparatively.

Before the introduction of the 1996 tariff increase government of Lesotho has refused to approve WASA's proposals to increase tariffs because the low cost for water was considered as a subsidisation to make water available to all, including the poor, who as it was assumed could not afford to pay high charges for water (TAMS 1996a). However this way of subsidisation has instead, mostly benefited those who use most water, and these happen to be those with private connections who in turn happen to be the most affluent

residents of Maseru. TAMS (1996a) summarises this problem by saying that the consequence of Government of Lesotho's attempts to control the cost of water for the benefit of the poor has been:

- To benefit the affluent section of the community who use large amounts of water.
- Prevent WASA from expanding service into other areas of Maseru where many of the poor live, thus depriving them of service.
- Prevent WASA levying tariffs that would enable it to be financially viable.

These problems could eventually result in deterioration to a point where people can no longer receive water. After 1996, government of Lesotho still continued to subsidise water for the benefit of the poor. In order to make water available to all, including those who cannot afford to pay even the minimum charge for water, government has put up public stand pipes where water is collected free of charge in WASA's area of designation. TAMS (1996a) reports that, within the WASA reticulated area there are about 18 000 households which receive water from public standpipes, that are paid for by the government. All those who cannot afford to pay for private connections get free water from these standpipes.

Generous as this might seem, this way of subsidisation has its shortfalls. Firstly, one has to bear in might that, outside the WASA area, everyone pays for their water supply including the poor. For example, in the rural areas served by the DRWS, people get access to a water supply system by contributing to the capital cost of construction of such a system. They also contribute a maintenance fund for the supply system as has been mentioned. In the peri-urban areas, outside the WASA boundaries, people get their water from a variety of sources including water vendors whose payments are always higher than WASA charges. It is worth mentioning that a majority of the poor people in Lesotho live in these areas.

This way of providing a subsidy to the poor therefore, is unlikely to succeed as one cannot be sure as to whether the 18 000 families receiving water for free from the public standpipes are really poor. Furthermore, it is known that the majority of the poor resides in the rural areas, where some sort of payment has to be put forward before a water system can be

installed. It is very much likely that many of the poor in the rural and peri-urban areas are even poorer than those in the urban areas who are getting water for free.

Secondly, another problem caused by subsidisation of service by government is that the free standpipes that are supposed to be paid for by the government are not paid in a timely manner (TAMS, 1996a). This results in WASA having to incur the costs and in turn being short of funds to maintain and expand its water supply system. This problem as TAMS (1996a) further recognises, has been made worse by government of Lesotho not allowing WASA to increase its tariffs for a number of years. WASA has practically been subsidising all consumers within its designated area.

WASA officials however reported through the interview that, with the introduction of the 2004 tariff increase it is hoped that there will be no direct subsidy given to any consumer groups either by WASA or by government of Lesotho. All users are going to pay for their water. They reported that high volume consumers are going to be charged significantly more to subsidise the lower consumption customers who are going to be charged comparatively lower.

4.3 POLICY ASSUMPTIONS ON WILLINGNESS AND ABILITY TO PAY

It is often assumed that the poor cannot afford to pay for water, hence introduction of government subsidy for water supply services. As indicated in Chapter Two, studies have revealed that this assumption is often an incorrect one. The Palmer Development Group (1998) as cited in Chapter Two indicates from the study that was conducted in the city of Johannesburg that the poor section of the population recognises that water is not a free good and that it must be paid for. This part of the population is in actual fact willing to pay for water services. Failure to actually pay has been found to be as a result of other issues such as political, and not due to inability or unwillingness to pay. This has also been the case in Lesotho. However, as has been indicated above, the poor always make a contribution towards installation of a water supply system. In some cases they even pay far more than the WASA tariff, even though the level of service is in most cases lower as compared to that received in WASA areas of coverage.

To further support this, Sechaba Consultants (1994; 1997) state that, the vast majority of customers in urban Lesotho, even those who claim to have no cash wage or income, can afford to pay for water services. The report further indicates that, not only are people able to pay, but they are also willing to do so, if the service is reliable and convenient. Table 4.4 illustrates the most important desired quality of water supply system according to a survey conducted in the urban centres of Lesotho by Sechaba consultants in 1997.

TABLE 4.4: Most desirable qualities of a water supply system in urban Lesotho, 1997

Supply system	**Reliability**	**Cleanliness**	**Ease of drawing**	**No queue**
Indoor tap	57	29	9	5
Tap in yard	112	78	23	13
Other private	58	43	33	25
Roof catchments	100	33	67	33
Public standpipe	60	34	28	33
Public hand pump	44	31	49	37
Tanker	71	29	57	43
River or dam	51	70	43	17
Spring	53	56	42	25

Source: Sechaba Consultants, 1997

As the table shows, the two most important requirements for a water supply system were reliability and cleanliness of water. A low price was mentioned as important by those purchasing water from vendors, but still only ranked eighth on the list of desired qualities of a water supply system.

Sechaba Consultants (1997) further reports that, while the vast majority of household with private connections are able and willing to pay for water provision services they strongly indicated that they can only pay for water if some dissatisfactions they have with WASA services can be worked on. People indicated problem such as improper billing procedures, improper metre readings and lack of communication on the side of WASA (particularly regarding notification before water supply is cut) and general lack of quality service.

This implies therefore that government assumptions on formulation of subsidisation policies are incorrect. As has been mentioned it has always been government's assumption that the poor are not willing and able to pay for water services. This has been the basis upon which government has disallowed WASA to increase its prices, but as Sechaba Consultants (1997) has revealed, the poor are willing and able to pay at least a minimum charge for a reliable and clean water supply. They are in actual fact, already doing so in the rural areas where a contribution has to be put forward before a supply can be installed, and in areas where they have to purchase water form vendors.

4.4 PROBLEMS OF WATER PROVISION

4.4.1 Payment for services and profitability

Payment for services provided is important to the profitability of any company as a way of cost recovery. According to the interview with WASA officials some of the main problems that the authority faces include non-payment and late payment of service. To solve this problems settlement of outstanding bills is negotiated, failing which total disconnection results. However it was reported that this has not helped WASA to recover cost incurred, and therefore the authority does not make any profit from the services it renders. This has been aggravated by the ineffective subsidisation policies as has already been discussed. In addition to these, the capabilities of WASA have also identified as a major problem.

4.4.2 Institutional capacity

According to Khotle (1995) a number of studies have considered the capabilities of organisations involved in the water sector and have identified many organisational weaknesses and the need for capacity building. WASA has been the subject of projects to assess and address such issues and the following inadequacies have been identified.

- Programs and projects are often affected by constraints in the institutional structure, thereby limiting the range of programmes and projects that can be introduced.
- Lack of clearly established policy
- Lack of an enabling environment, partly related to bureaucratic procedures.

Being the only organisation that is charged with the responsibility of supplying urban areas with water at present, WASA is faced with a whole range of issues that need immediate attention. As indicated in the Bureau of Statistics (1996), the possible magnitude of expansion of Lesotho's urban population indicates that the urban population may grow from around half a million today to nearly 1.7 million by the year 2025 with around 1 million of this concentrated in Maseru only (see Chapter Three). Although in itself this represents a major challenge for WASA, TAMS (1996a) recognises that the scale of the task is made considerably greater by the following facts;

- At present, WASA is serving only around 50% of urban residents within its designated areas of responsibility, and therefore needs to strive towards expansion of service.
- Based on the second definition of "urban" as described in chapter 3, around 31 additional centres may need to be added to WASA's area of responsibility thereby increasing the population that needs service.
- The demand for higher levels of service, including household connections rather than community delivery points, will probably rise significantly with improvements in income levels.

To meet this challenge, there will be a need to ensure that WASA and other providers of urban water services that may be formulated achieve high levels of performance and develop and maintain a clear focus on the delivery of distribution systems.

4.5 WATER QUALITY

Chakela (1999) recognises that it is easy to think of water resources consisting of quantity of water available to the nation, but when water availability becomes limited due to change in quality (the chemical, physical or biological characteristics of water), it becomes clear that the water resource consists of both the quality and quantity of water. Having abundant water that is of poor quality that can be harmful to humans is a deficiency. It is therefore important to bear in mind that the quality and quantity of water in terms of availability are directly linked.

Water quality has a major impact on all forms of life. However it should be realised that quality is defined in terms of the uses for which the water is intended. There are therefore differing water quality specifications tied to uses such as domestic, industrial, irrigation, animal watering etc. The treatment of raw water allows for the use of water of a quality that would otherwise not be acceptable.

The quality of water is often reduced by pollution and De Baulny (1980) further recognises that, water pollution sources can be categorised into two main groups namely, point sources and non-point sources. Point sources, as he explains, are wastes or pollutants that originate from a definite source and are carried away to treatment or waste disposal sites. These types of pollution sources are easily identifiable as potential sources of water quality change and they include sewered industries, municipal sewage treatment plants and household sewage systems. Non-point sources on the other hand, are generated by uncontrolled wastewater disposal. These include agro-chemicals from agricultural land, animal wastes, urban storm run-off, pit latrines, and unlined septic tanks.

Water quality change in Lesotho's urban areas is brought by both point and non point sources. Chakela (1999) further reports that, major pollution sources that need to be taken into consideration in Lesotho include the following:

- The sheepskin tannery in Maseru, which emits chromium compounds
- The stonewash denim factories in Maseru, emitting a blue effluent which is discharged into the Caledon River without treatment.
- The Maseru abattoir
- Hospitals which discharge untreated effluent
- Manufacturing and processing industries in Maseru, Maputsoe, Mafeteng and Buthe-Buthe (e.g. canneries, pharmaceutical companies, brewing, ice-cream factories, flour mills, fertiliser blending and packaging factories, and clothing manufacturers)
- Waste generated and dumped by small enterprises
- Sewage works and untreated effluent from rural communities
- Rubbish and waste dumping sites which are not properly managed, allowing for leaching into the water resources
- Agricultural run-off and dipping practices.

- Mining activity

As has been mentioned raw water treatment can improve water quality, thus the use of that water for purposes that would otherwise not be acceptable. Likewise, raw water is first treated in order for it to be suitable for domestic use. WASA is responsible for the treatment and distribution of treated water in the urban areas of Lesotho, and the authority uses the WHO guidelines for drinking water standards.

Officials from WASA reported that in order to monitor water quality WASA conducts analytical laboratory checks for quality of both raw and treated water countrywide. The frequency of sampling depends on the severity of potential for pollution. Samples are taken at least once a week for district plants and once daily for Maseru where most pollutants are produced. WASA (2002) also reports that external laboratories are sometimes contracted in cases where WASA does not have the capacity, for quality checks, and although standards are not always met, the water produced by WASA is always of acceptable quality for consumption.

Table 4.5 is an illustration of water quality indicators from the analysis of water samples taken from public standpipes, and reticulation systems in various towns in Lesotho.

TABLE 4.5: Quality of water treated for domestic use in Lesotho's urban areas, 1996

Urban Area	**Total CL (mg/l)**	**Turbidity (NTU)**	**pH**	**Alkalinity (mg/l)**	**Total Hardness**	**NO_3 (mg/l)**	**Total Coliforms no./100ml**
Maseru	1.84	0.81	7.1	70.4	96.4	0.58	0.3
Morija	0.23	20.07	8.0	117.0	60.5	0.53	0.0
Mafeteng	0.09	11.52	5.9	35.4	100.5	0.75	0.5
Teyateyaneng	1.25	2.72	7.2	132.7	138.4	0.57	4.8
Peka	0.22	0.48	7.3	147.3	155.7	1.15	2.2
Thaba-Tseka	2.05	1.60	8.0	138.0	265.0	1.40	0.0
Mohale's Hoek	1.87	1.13	7.3	95.2	138.0	0.20	0.0
Quthing	0.30	2.41	7.8	94.3	99.0	0.20	6.0
Maputsoe Mapoteng	0.14 0.03	1.21 0.16	7.6 8.0	147.3 63.5	116.3 51.3	- 0.40	1.8 170.3
Butha-Buthe	1.64	1.27	8.0	188.7	157.6	0.24	8.5
Leribe	0.92	5.23	7.4	80.6	87.0	0.93	7.1
WHO Guidelines	250.00	5.00	6.5 to 8.8	200.0 (EU and USA)	500.0	3.00	0.0

Source: TAMS, 1996a

As the table indicates, there is a high level of coliforms present in drinking water, and this implies that there is some microbiological pollution in the water. Chakela (1999) explains that, micro-biologically polluted water is associated with the transmission of infectious diseases such as gastro-enteritis, cholera, typhoid and hepatitis. In contrast with what WASA officials have reported, the levels of coliform count in more than half of the towns surveyed are unacceptable.

Looking at turbidity, which can be explained simply as the level of cloudiness in water that occurs as a result of presence of some suspended matter such as soil, algae, and other microscopic organisms, Table 4.5 shows that the turbidity of water samples from Leribe is high while that from Morija and Mafeteng is far above the acceptable level. The other water quality indicators such as nitrates (NO_3), alkalinity, and hardness seem to be within acceptable limits according to WHO guidelines.

One can conclude therefore that in contrast with what WASA officials have reported, the quality of water that is produced by WASA does not always in some cases conform to the recommended standards. This, in addition to the need to expand the area of operation, places tremendous pressure on WASA to provide a quality product to the majority of the Lesotho urban residents.

4.6 WATER PRODUCTION AND UTILISATION

4.6.1 Extraction and treatment of raw water

According to Parkman Consultants (2003), the main raw water source for Maseru is an off channel storage reservoir called Maqalika, located to the north-eastern part of the town. The reservoir gets water through the natural inflow from the surrounding catchment as well as from the nearby Mohokare / Caledon River, which is the main source. Water from the river is pumped into the reservoir through a transfer pumping station at the river-bank.

Parkman Consultants (2003) further reports that the Maqalika reservoir has a total yield of between 23.7 mega litres per day and 35.5 mega litres per day. A pumping station located

adjacent to the dam pumps raw water to the reservoir through a 400mm line to the Maseru Treatment Plant located at the Maseru West industrial Area. The plant also receives run-off river water directly from the Mohokare / Caledon River, except during extremely low periods. The existing water treatment according to Parkman Consultants (2003) and WASA (1996a) comprises two treatment plants, and includes all purification processes as follows;

The first stage of raw water treatment is resettlement or natural sedimentation. This is where particles in water are allowed to settle naturally. According to WASA (1996a) the turbidity (suspended particles in water) at this stage, is reduced by 40%. The next stage involves coagulation. This is when chemicals are added to water to encourage suspended particles to form, thus further reducing the turbidity of water. This is followed by flocculation. At this stage particles formed during coagulation coalesce or stick together and settle due to gentle stirring or agitation. The water is then transferred into another tank to allow the particles heavier that water to settle down by gravity. This is the second sedimentation stage. As the particles increase in mass, settling takes place at a faster rate. The target turbidity for primary effluent is a maximum of 100NTU, while in the secondary sedimentation tanks the effluent is expected to be a maximum of 4NTU. The raw water from the river is a maximum of 4000 - 6000NTU in rainy seasons and around 100NTU in dry season.

The next stage includes stabilisation where chemicals are added to water to control the pH, thus making it non-corrosive and non-scale forming. According to Chakela (1999), the WHO guidelines for the pH are around 6.5 - 8.5. This stage is followed by the filtration stage. During this stage sand filters are used to further eliminate particles in water. Chakela (1999) further reports that according to the WHO guidelines, turbidity of filtered water must not exceed 1.0 NTU.

The last stage is the chlorination stage. This process is also carried out at the beginning of the water treatment process. At the beginning pre-chlorination is applied to sterilise the treatment plant in order to destroy algae and to retard algae formation. The last stage of chlorination is for destruction of pathogenic and other organisms before water is distributed and reticulated for general use by the public. WASA (1996a) reports that, as treated water

leaves the plant to service reservoirs, residual chlorine must be at the range of 1 - 1.5mg/l, and must be 0.2mg/l at consumer's tap. Figure 4.2 shows the different treatment stages undertaken at the Maseru Treatment Plant to produce potable water.

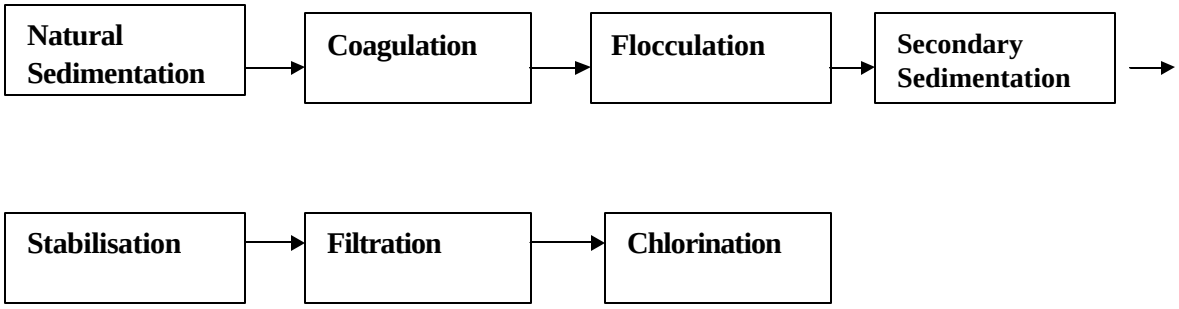

FIGURE 4.2: Sketch of the different stages of water treatment at the Maseru Treatment Plant

From the WASA treatment plant in Maseru, treated water is distributed through a network of underground pipes to eight reservoirs in the urban areas of Maseru.

According to TAMS (1996a), WASA's policy objective derives from its mission statement of efficiently meeting the demands of the rapidly increasing population in the designated urban areas of Lesotho with safe, affordable and adequate water supply. To meet this objective the WASA treatment plant in Maseru produces around 24 mega litres per day, with a seasonal peak of 30 mega litres per day. However in recent years it has become apparent that this production capacity is far less than customer demand both in Maseru and other towns, (WASA, 1996a).

4.7 CONCLUSION

In conclusion, one can say that since its establishment in 1992, WASA has always been faced with the challenge to extend the provision of its services to more of Lesotho's rapidly growing urban population. To meet this challenge, WASA will have to extend its network into the peri-urban areas. In addition to this, the authority is also facing an increasing pressure to operate in a viable and sustainable manner. However, Government of Lesotho, through its ineffective policies, has always stood on the way for WASA to meet the above challenges and improve its levels of performance. This is particularly so because the government, as TAMS (1996a) recognises, has been caught up in a situation where its policies for water provision can be said to be contradictory. While policies were geared towards provision of water services at an affordable price, they were also aimed at full

operational cost recovery that will sustain WASA. Seemingly, none of these have been fully achieved. Water supply policies have not been in favour of WASA's ability to function sustainably, and neither have the poor been provided with adequate water supply because of inefficient policies. This could also be regarded as the reason for WASA being unable to produce accepted quality water to the people. In order for WASA to succeed, the authority needs to reform, and operate as an autonomous organisation. However, several issues may need to be considered before this can be done. Having considered policy and the assumptions it is based on the emphasis in Chapter Five shifts to the empirical research in Maseru.

CHAPTER FIVE: PERCEPTIONS OF RESIDENTS OF MASERU URBAN AREA ON WATER PROVISION

Like many developing countries, Lesotho has been undergoing major population shifts that have led to an increase in the demand for urban water (see Chapter Two and Chapter Three). WASA, the body responsible for meeting this challenge, is now striving to deliver its services to more of the country's rapidly growing urban population. To meet this challenge WASA will need to extend its network to provide services in centres that are currently outside its area of responsibility, in an effort to provide all inhabitants of the urban centres of Lesotho with water supply services (see Chapter Four). The question that one asks is whether policy issues surrounding water supply in Lesotho allow for efficient service delivery. In this chapter, the emphasis shifts from the policy related chapters to the actual results of the survey that was undertaken as part of the study. In previous chapters it has been revealed that policy guiding water provision has not been effective enough to enable efficient water provision. This overall statement will be empirically tested in this chapter by considering some major findings that indicate this. Previous chapters have revealed that access to water is determined by elements such as adequacy, safety and convenience of a water supply system. Previous chapters have also revealed that the cost of water also plays a major role in adequate water provision. The purpose of this chapter is therefore to test some of these findings empirically.

It is against this background that the chapter presents an evaluation of the perceptions of urban Maseru residents on water provision. In order to do this, firstly, an overview of the study area is given. This mainly highlights the biographic and the socio-economic profile of the households interviewed. Then an assessment of major sources of drinking water for households in the study areas is given. This will be followed by a comparative overview of water use within the study area. Water use will be looked at in terms of basic consumption, domestic consumption and discretionary or non-domestic consumption. Following this, the chapter will examine the affordability of water together will the willingness of customers to pay for water services. In this section the current payment for water will be assessed together with customers' perceptions of the current price of water relative to the quality of

service they get. Finally the chapter will consider the quality of water in relation to health. Figure 5.1 below illustrates the outline of this chapter.

It must be noted that the data given in this chapter has been assessed, firstly, in terms of the main source of water, which determines the level of access, and, secondly, in terms of the sub-area which determines the type of settlement. The reason for this is that these have been identified as main features that directly affect water provision in urban Lesotho. An overview of the methodology used for this study was given in Chapter One.

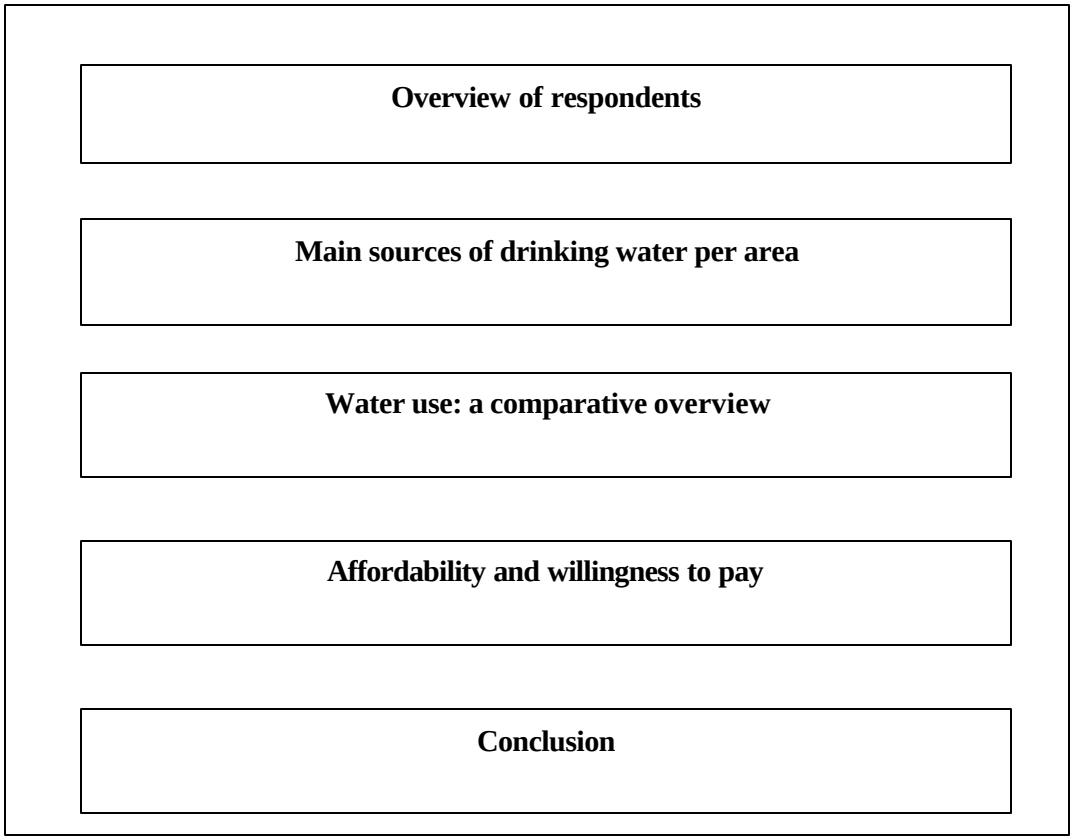

FIGURE 5.1: Outline of Chapter Five

5.1 OVERVIEW OF RESPONDENTS

In order to obtain the biographic and socio-economic profile of the study area, the following household characteristics were noted: Firstly, the gender distribution of the respondents was analysed and results show more female (66%) than male respondents (34%). This could be

a confirmation that women are naturally more knowledgeable about water issues, and are more willing than men to participate in water issues. Secondly, the age distribution of the respondents was looked at. Results indicate a range of between 18 and 72 years. However, a majority of the respondents (77%) were aged between 21 and 50 years. Only 1% of the respondents were aged below 20 while 22% were aged above 50. Thirdly, analysis of the households size indicated that a majority of the households had a membership of between three and six, with the smallest household sizes (below five members) more predominant in the high and middle income planned new areas, while the larger household sizes were found in the old, unplanned, low income areas. With regards to level of education of the household head, it was predominantly high (tertiary level) in the new, high income planned areas, and predominantly low (primary level) in the old, unplanned low income areas. Lastly, the total household income was also assessed. Results are shown in Table 5.1.

TABLE 5.1: Total household incomes of sampled households in Maseru in 2002

Total household income in Maloti (M)	**%**
0	1
<500	7
501-1000	17
1001-1500	7
1501-2000	6
2001-2500	7
2501-3000	9
>3000	46
TOTAL	**100**

As illustrated, the majority of households in the sample (46%) earn more than M3000. However there are a significant number of households (17%), which earn M1000 and less. There is also a considerable group of households which do not earn any income. Maloti is Lesotho currency, with M1.00 being equivalent to R1.00.

Another household characteristic that the study analysed was the general level of the water supply service in the area. Results show that more than half of the households interviewed (54%) have in-house water service connections, 14% have tap in-yard connections, while a

significant percentage (30%) use communal taps. Only 2% obtain water from other sources such as tanks or a neighbour's tap. Generally, the biographic and socio-economic profile of the sampled households shows a fair representation of the types of households that exist in Urban Maseru.

5.2 MAIN SOURCES OF DRINKING WATER PER AREA

To investigate the effects that different types of supply have on the amount of water available to the household, a comparison of the households' main source of drinking water in the four sub-areas was made. Table 5.2 below shows the results.

TABLE 5.2: Comparison of households' main source of drinking water in different sub-areas within Maseru in 2002

Sub-Area	Tap in house		Tap on site		Communal		Other		Total	
	n	%	n	%	n	%	n	%	n	%
New high income planned area	39	100	0	0	0	0	0	0	**39**	**100**
New middle to low income planned area	4	19	7	33	8	38	2	10	**21**	**100**
Old low income unplanned area	0	0	4	20	16	80	0	0	**20**	**100**
New low income unplanned area	2	10	4	20	13	65	1	5	**20**	**100**

As the results indicate, all households in the high income, planned area have an in-house tap connection, and none are using communal taps or other sources such as a tank or a neighbour's tap. In the middle to low income, planned area, 19% of the households have an in-house tap service while 33% have an on-site tap and 38% rely on communal taps. This shows that while most households in this sub-area have individual taps as their main source of water, a significant percentage still rely on communal taps for their supply.

For households in the old, unplanned, low income areas, 80% rely on communal taps, and only 20% have an on-site service. None of the households in this area reported having an in-house service. In the new, unplanned area, households' main sources of water vary greatly,

with a majority (65%), depending on communal taps, while 20% have on-site services and at least 10% have in-house taps.

5.3 WATER USE: A COMPARATIVE OVERVIEW

The composition of water use was investigated in order to establish the actual consumption of water for different purposes in the four sub-areas identified. This will also be used to determine the proportion of water used for 'basic needs' and 'discretionary use', according to international standards. In addition, it is also important to establish whether WASA is meeting its objective of ensuring that households using water for basic needs benefit from a favourable tariff, while those using water for discretionary purposes (especially non domestic) pay higher amounts for this water.

It should be noted that results obtained on water use, particularly on the amount of water used by households per day, can only be considered as estimates because respondents did not know the exact amount of water used. This is particularly so in cases in which water had to be collected from a public standpipe away from the house, because no record of the amount collected is kept. To get the amount used per capita per day, the number of litres consumed per household was divided by the average number of household members.

5.3.1 Basic consumption

The WHO has determined that an individual needs to use at least 30 litres of water per day to remain healthy (see Chapter Two). As has been mentioned in Chapter Four, Lesotho has adopted this standard and WASA has been assigned to meet this standard in its area of designation. WHO has established a link between the quantity of water used and maintaining good health. The argument is that individuals using less than 30 litres per day are more likely to suffer from water related diseases than those using more. In respect of the total average household consumption, results show that households with in-house water supply use, on average, 500 litres per day. Those with in-yard supply use about 330 litres per day, while those who use public water supply use an average of 43 litres per day. The per capita consumption for these averages, however, indicates that a significant proportion of the households are using less than the international standard. A comparison of household consumption per capita per day, for different types of supply systems, is illustrated in Figure 5.2 below.

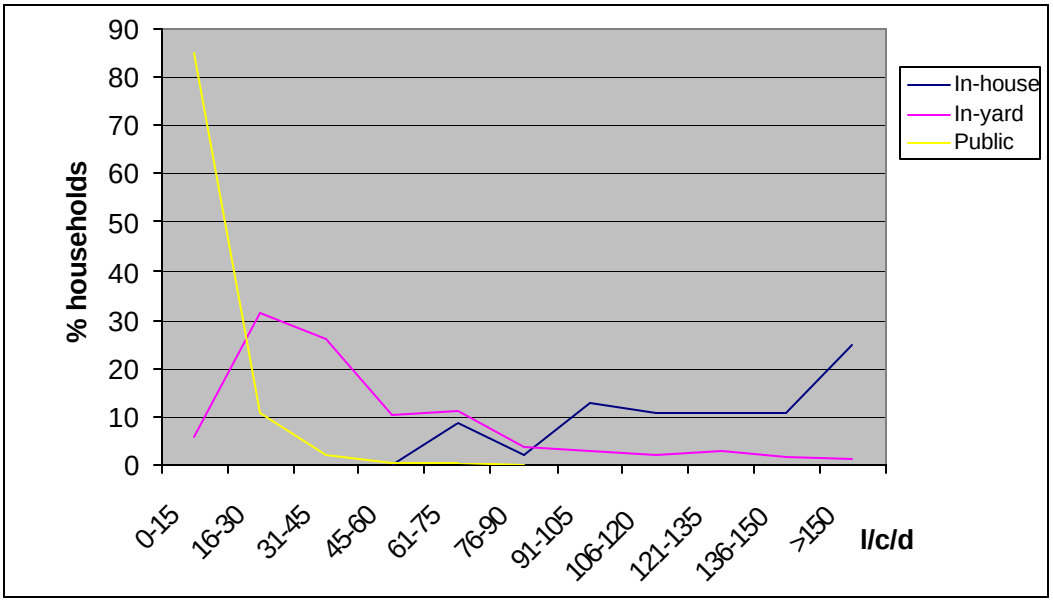

FIGURE 5.2: Household water consumption in litres per capita per day by type of supply in Maseru in 2002

As the results show, none of the households who use in-house water supply are using less than 60l/c/d. About 71% of these households are using more than 75l/c/d, while about 25% are using more than 150l/c/d. For households who have in-yard water connections, approximately 37% are using less than the recommended 30l/c/d, while only around 2% are using more than 150l/c/d. For households which use the public water supply, a high majority (96%) are using less than the recommended standard, while a very small minority of about 4% are using more than 31l/c/d. Generally, the majority of households without a private connection, that is those who use communal water, are consuming less than the 30l/c/d required for maintaining a healthy living standard. Only a few of these households are using more than the recommended standard. By contrast most households who have an in-yard tap connection are using 30l/c/d and more. However, there are still some households in this category using less than the recommended standard. None of the households with in-house connections are using less than 60l/c/d.

With regards to consumption, the data above suggests that WASA is not reaching the households as reflected in their mandate. To a large degree water consumption is directly related to access to water. However, the fact that WASA currently serves half of the population within its area of designation reflects negatively on WASA. This problem can

most probably be attributed to the tariff structure, as discussed in Chapter Four. Furthermore, water consumption that is below the recommended standards can pose a health risk to the people. (See Chapters Two and Four). The fact that there are people who use less than the recommended standard of 30 l/c/d also reflects badly on WASA.

5.3.2 Consumption for domestic purposes

As has already been illustrated, households that access water through the convenience of an in-house service use far more water than those who have to draw water away from the house. Results further reveal that all the households in the study area use water at least once a day for domestic purposes, such as bathing, cooking and drinking, although in different quantities, depending on the type of water source that the household uses. An interesting finding is that water is used less frequently for purposes of washing clothes in particular, than for other needs. In this case, water use seems to be much more closely related to the type of water supply service available to the household. Table 5.3 illustrates the frequency of water use for purposes of washing clothing against the type of water source available. The assumption is that the frequency of water use will directly affect the total amount of water consumed.

TABLE 5.3: Frequency of water use for washing purposes by type of service available in Maseru, 2002

Type of service	Once a day		Once in two days		Once in three days		Once in four days		Total	
	n	%	n	%	n	%	n	%	n	%
In-house tap	11	24	11	24	14	32	9	20	**45**	**100**
On-site tap	1	7	1	7	6	40	7	47	**15**	**100**
Communal tap	0	0	1	3	7	19	29	78	**37**	**100**
Other sources	0	0	0	0	0	0	3	100	**3**	**100**

As the results show, 24% of the households with an in-house tap service use water at least once a day for purposes of washing clothing, while this applies to only 7% of those with an on-site tap service. None of the households using communal taps or other sources use water as frequently as once every day for washing. A larger percentage (78%) of households who use communal taps, use water at least once in four days for washing clothes. The implication

here is that even though water use for washing purposes appears to be less frequent when compared to other uses, it remains highest for households with an in-house tap service as they use it more frequently than households without this service. In the same manner, water consumption will be comparatively less frequent and therefore lower for households who have to collect water outside or away from the house.

A comparison of the frequency of water use for washing was also made in the four sub-areas identified and the results are shown in Table 5.4.

TABLE 5.4: Frequency of water use for washing purposes by sub-area in Maseru, 2002

Sub-area	**Once a day**		**Once in 2 days**		**Once in 3 days**		**Once in 4 days**		**Total**	
	n	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
New, planned, high income	10	26	11	28	10	26	8	20	**39**	**100**
New, planned middle to low income	2	10	0	0	6	28	13	62	**21**	**100**
Old low income unplanned	3	15	2	10	4	20	11	55	**20**	**100**
New low income unplanned	0	0	1	5	5	25	14	70	**20**	**100**

Results indicate that a significantly higher percentage (26%) of households in the new planned high income area use water at least once a day for washing purposes. This number goes down to 10% in the middle to low income area, and 15% in the old unplanned area. For the newly planned middle to low income and the old unplanned areas, the number of households seems to increase with a decrease in the frequency of water use, so that comparatively higher percentages (62% in the newly planned, middle to low income area and 55% in the old, unplanned area) use water at least once in four days for washing. This also implies a comparatively lower water usage by households in these two areas.

The above trend regarding water use seems to apply in respect of sanitation purposes as well. The total amount of water used by households for sanitation purposes seems to be

greatly influenced by the type of sanitation facility that the household is using, as indicated in Table 5.5 below.

TABLE 5.5: Frequency of water use for sanitation purposes against type of water source in Maseru, 2002

Type of water source	At least once a day		Never		Total	
	n	**%**	**n**	**%**	**n**	**%**
Tap in house	45	100	0	0	**45**	**100**
Tap in yard	1	7	14	93	**15**	**100**
Communal tap	0	0	37	100	**37**	**100**
Other	0	0	3	100	**3**	**100**

As the results show, those households with in-house connections tend to use significantly more water than those with other types of sanitation facilities. All the households in the study area with an in-house tap service also have an in-house sanitation facility and use water at least once a day for flushing. This applies to only 7% of the households with an in-yard tap service, while none of the households that rely on either communal water or other sources of water, ever use water for sanitation purposes. This again shows that the convenience of an in-house connection facility implies increased water consumption when compared to outside service. At the same time the results also reflect negatively on the availability of sewage infrastructure in the areas and the inability to provide for the ever-increasing urban population (see Chapter Three).

The frequency of water use for sanitation was also observed in each of the four sub-areas, and Table 5.6 shows the results.

TABLE 5.6: Frequency of water use for sanitation purposes by sub-areas in Maseru, 2002

Sub-area	Once a day		Never		Total	
	n	**%**	**n**	**%**	**n**	**%**
New high income planned area	39	100	0	0	**39**	**100**
New middle to low income planned area	5	24	16	76	**21**	**100**
Old unplanned area	0	0	20	100	**20**	**100**
New unplanned area	2	10	18	90	**20**	**100**

As illustrated by the results, all households in the new high income planned area use water at least once per day for sanitation purposes. None of the households in this area reported using a non-waterborne sanitation facility. In the middle to low income planned area, only 24% of the households reported using water every day for sanitation purposes. A greater majority of households in this area (76%) reported that they never use water for sanitation purposes, as they do not own such a facility. In the old unplanned area, all households reported that they never use water for sanitation, while in the new unplanned area, only 10% do.

The implication here is that the consumption of water is higher in the high income planned area than in the other areas because all households in this area use waterborne sanitation facilities, the assumption being that the use of a waterborne sanitation facility means an increase in the total household water consumption, as a single flush consumes an average of 10l. All households who own such a facility reported that they use it at least once a day and none are using it less than once in two or more days. This means further increased total household water consumption. From a policy perspective four aspects should be noted. Firstly, improved access seems to be necessary. Secondly, it should also be realised that an increase in access to water provision will most probably increase water consumption. Thirdly, having accepted the above two conclusions, it is important that planning should be done not only to expand water provision, but also to make it financially viable. In the fourth place the expansion of water provision should also go hand in hand with awareness about water consumption.

5.3.3 Discretionary / non domestic water use

Assuming that 30 l/c/d per day is what is theoretically needed to maintain good health, it can be argued that any consumption above this is therefore discretionary. This, however, does not mean that households using more than 30 l/c/d are being wasteful, as the extra water is in fact in most cases used for domestic purposes, with relatively few households using it for non-domestic purposes such as watering gardens or washing cars.

In order to assess the amount of water used for discretionary purposes in the different sub-areas, and for different levels of service, the respondents were asked to mention how frequently they use water for washing cars and for watering their gardens, as examples of discretionary use. Figure 5.3 below shows the frequency of water use for washing cars against the type of supply that the household uses.

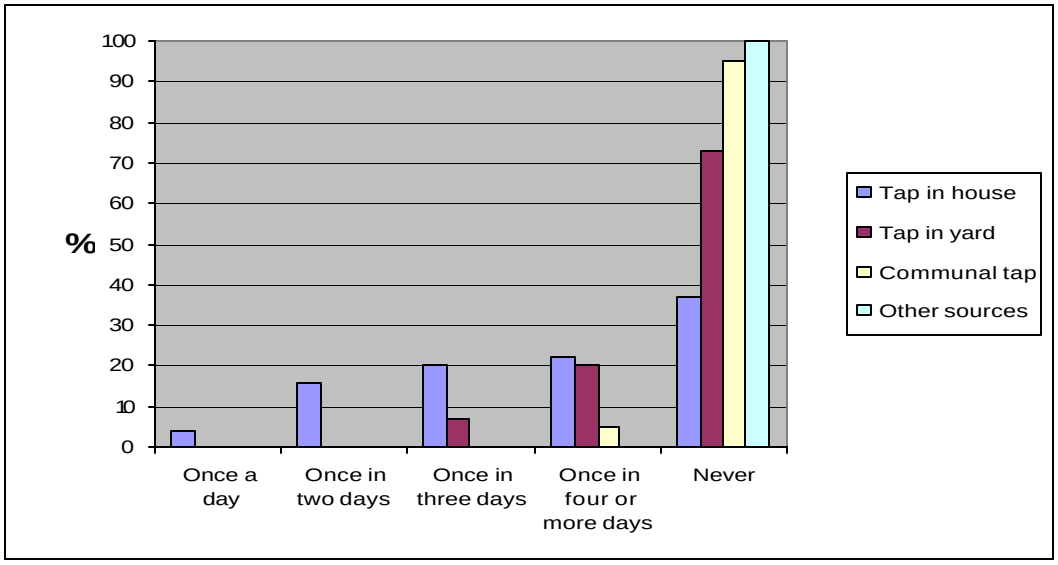

FIGURE 5.3: Frequency of water use for washing cars by type of water supply in Maseru, 2002

As Figure 5.3 shows, none of the households using communal taps or other sources of water reported using water for washing cars, while 20% of those with an in-yard tap service reported using water at least once in four days (or more) for washing cars. For those with in-house connections about 16% reported using water at least once a day for washing cars.

The above results indicate that water for discretionary purposes is used more frequently in those households who have in-house and in-yard tap connections and use becomes less frequent for those who use communal and other sources of water.

In regard to the sub-areas, Figure 5.4 shows the frequency of water use for washing cars in the four sub areas.

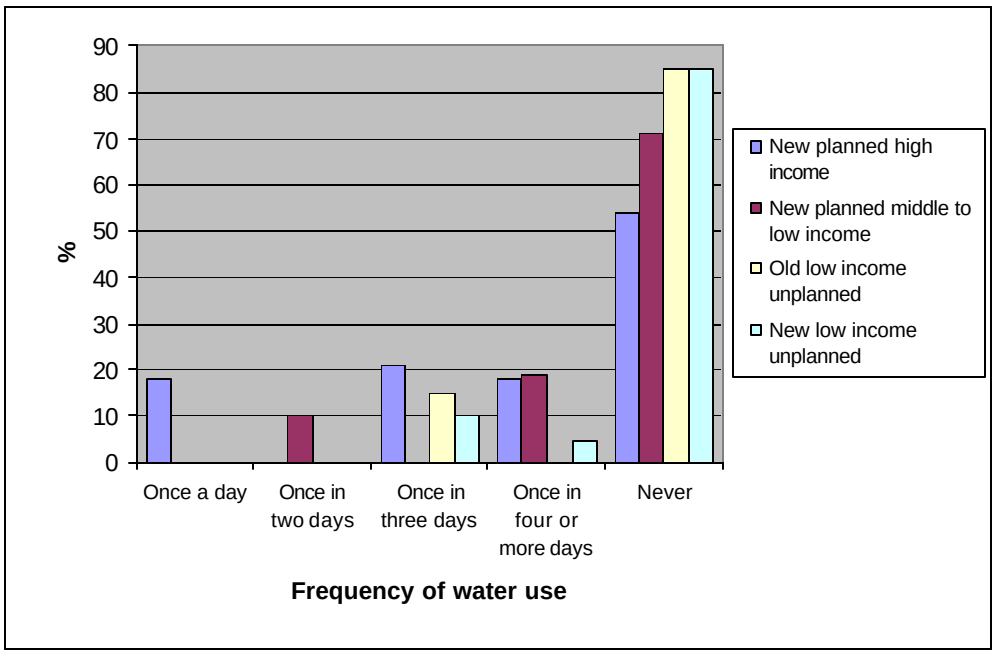

FIGURE 5.4: Frequency of water use for washing cars by sub-area in Maseru, 2002

As the above figure indicates, a comparatively high percentage (about 18%) of households in the new high income planned area reported to use water at least once a day for washing cars. However, this does not apply to any of the households in the rest of the areas. In fact, a large majority of households in these areas (71% in the new middle to low income planned area, 85% in the old low income unplanned area and 85% in the new low income unplanned area) reported that they never use water for washing cars. Generally, it can be said that the frequency of water use for washing cars is higher in the new high income planned area than in the other three areas. This conclusion also supports the earlier conclusions that higher income residents use proportionally more water. It also creates an opportunity for cross-subsidisation.

A similar trend to the one observed above has also been observed in the case of watering gardens, as indicated in Figure 5.5

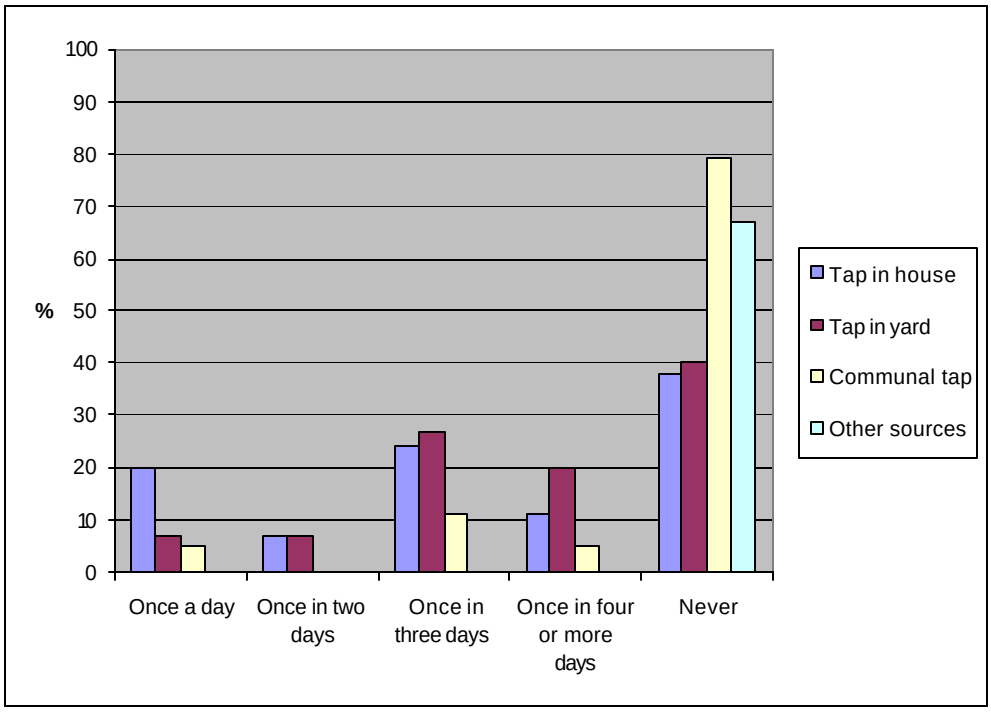

FIGURE 5.5: Frequency of water use for watering gardens by type of service in Maseru, 2002

As the figure shows, a significant percentage of households with an in-house tap service (20%), water gardens at least once a day. This is the case for only 7% of households with an in-yard tap and 5% for those using communal tap water. By contrast, a majority of households (about 79%), using communal tap water reported that they never water gardens, while this is the case for about 67% of households who use other sources of water such as tanks or a neighbour's tap.

The frequency of water use for watering gardens was also observed against the different sub-areas identified, and Figure 5.6 below shows the results.

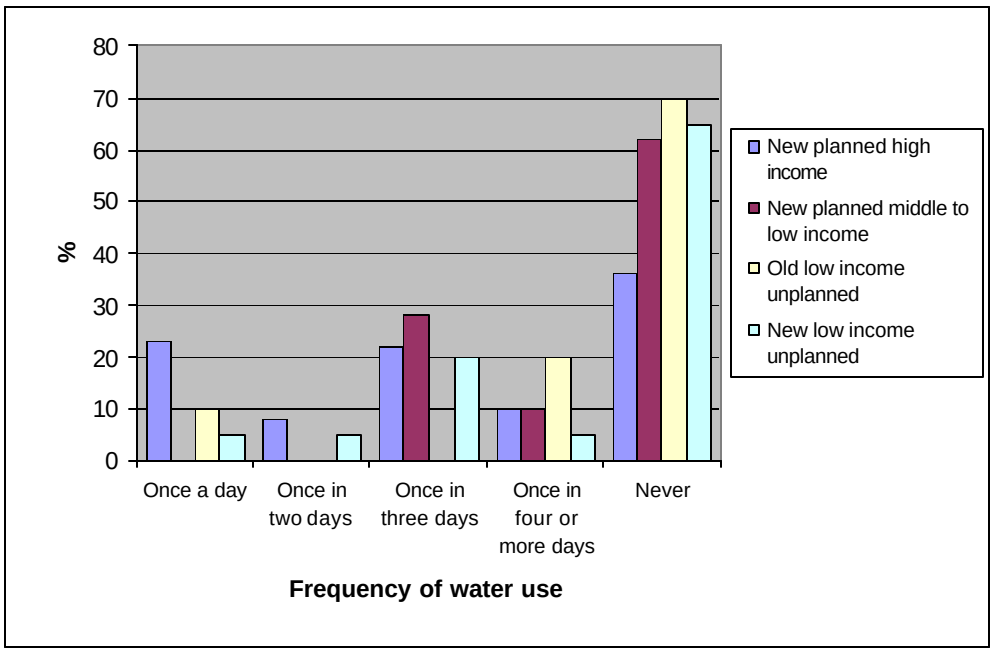

FIGURE 5.6: Frequency of water use for watering gardens by sub-area in Maseru, 2002

As illustrated, a significant number of households (around 23%), in the new planned high income area, water gardens at least once a day, while this does not apply to any of the households in the middle to low income planned area. In the unplanned areas, results show that only 10% of the households in the old low income areas water gardens once a day, while this applies to only 5% in the new low income area. In fact, a majority of households (70%) in the old unplanned low income area, reported that they never use water for gardening purposes.

Results further indicate that the frequency of water use for non-domestic purposes differs significantly in each of the sub-areas, with the most frequent water use recorded in the high income, planned areas.

As can be seen, the frequency of water use for washing cars and for watering gardens, which are examples of discretionary non-domestic uses, is higher for those using in-house and in-yard connections than for those who use communal water, which often has to be collected some distance from the house. Furthermore, consumption for discretionary use seems also to be more frequent in the high income planned areas than in the other areas, and

is less frequent in the low income unplanned areas. This further implies comparatively high consumption in the high income area. In essence, an increase in access to water means an increase in water consumption. The question is, will WASA be able to provide for this increased consumption?

The implication here is that discretionary or non-domestic use is highest for those households who have the convenience of a privately owned supply and lowest for those who have to collect water away from the house. It is also higher in the high income planned area than in the other sub-areas. One can therefore conclude that, according to the results, the frequency of water use and the type of consumption (i.e. domestic or non domestic), are directly related to, and mainly determined by, the type of water source that the household uses, which in turn is highly influenced by the sub-area in which the household is located. This raises the question of water subsidisation for the poor. As can be seen, it is very likely that the households who are benefiting from the subsidy are the high consumption households, despite the fact that these households are predominantly in the high income areas which use privately owned systems, as has been indicated.

5.4 AFFORDABILITY AND WILLINGNESS TO PAY

Affordability and willingness to pay for water are two of the problems that the study investigated. The main aim was to assess the affordability of water in terms of the price that WASA customers pay in relation to consumption, and their ability and willingness to pay for services. Also investigated in the study is the willingness to pay for water services and some of the problems faced by WASA that affect customers' willingness to pay. The attitudes of customers towards payment for water and what influences such attitudes were also focused on by the study.

In regard to the sampled households in general, results show that of the 100 households interviewed, a considerable majority (63 households) are paying for the water that they consume. Of these, 51 households are paying between M1 and M150. Only 12 households reported to be paying more than M151 and none are paying more than M500. The monthly

household payment seems to average between M51 and M150. Comparisons of payment for different sub-areas are presented in the following sections.

5.4.1 Current payment for water: a comparative overview

To assess the actual amount of money paid for water in each of the sub-areas, respondents were asked to indicate their monthly payment for water, and Table 5.7 below illustrates the results.

TABLE 5.7: Current monthly payments by sub area in Maseru, 2002

Sub-area	Nothing		< M50		M51-M150		M151-M300		M301-M500		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
High income planned area	0	0	2	5	27	69	9	23	1	3	**39**	**100**
Middle to low income planned area	8	38	7	33	5	24	1	5	0	0	**21**	**100**
Old low income unplanned area	16	80	1	5	2	10	1	5	0	0	**20**	**100**
New low income unplanned area	13	65	1	5	6	30	0	0	0	0	**20**	**100**

As can be seen, the results suggest that all households in the high income, planned area pay for the water that they use. This applies to 62% of the households in the middle to low income, planned area, and to only 20% in the old unplanned area. In the newly developed, unplanned area, the percentage rises to 35%. Generally, the majority of households who pay for water are in the planned areas. Table 5.8 below, further illustrates payment according to the type of water supply available to each household.

TABLE 5.8: Current monthly payment and type of service available per household in Maseru, 2002

Type of supply	Nothing		<M50		M51 - M150		M151 - M300		M301 - M500		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
In-house	0	0	3	7	31	69	10	22	1	2	**45**	**100**
In-yard	0	0	5	33	9	60	1	7	0	0	**15**	**100**
Communal	37	100	0	0	0	0	0	0	0	0	**37**	**100**

Other	0	0	3	100	0	0	0	0	0	0	**3**	**100**

As can be seen, all of the households with in-house and in-yard connections pay for their water, while none of the households using public water are paying for water. The implication here is that all households with private water connections pay for water, while those who do not have private connections, but rely on public water supplies, do not pay. From a management perspective there is thus pressure to provide water in such a manner that it can be measured and that it is possible to get payment for the water.

A larger percentage of households with in-house connections (69%) are paying between M51 and M150 per month for the water that they use. This applies to 60% of those with an in-yard connection. This indicates that for those households who pay for water, a majority pay between M51 and M150 per month. A significantly smaller percentage (7%) of households with in-house connections are paying less than M50 per month for water, while this percentage is comparatively higher (33%) for those who have in-yard connections.

The implication of the above findings are that households with in-house connections, who, as has been indicated, are the ones with the highest consumption, do not seem to be actually paying for their high consumption of water. While it is true that the largest consumers seem to be paying comparatively higher amounts for water, the payment is not truly reflective of the large quantity of water that they consume. This is particularly so when one looks at the fact that a majority are actually paying between M50 and M150, which are very minimal charges. One would expect a majority of these households to fall into the highest payment categories. This again raises the question of limiting tariff increases as a way of subsidising water for the poor (See Chapter 4). The practice has neither benefited WASA nor the targeted group, which is the poor, because WASA's financial status remains unstable, while at the same time only the rich are enjoying high consumption of water at low cost.

5.4.2 Customers' perceptions of quality of service

As discussed in the previous chapter, the price of water in relation to quality of service that the customers receive can affect their willingness and ability to pay for the service. Perceptions of customers of the current payment were investigated to establish whether WASA customers are receiving a service that encourages them to continue to pay for their

water supply. In order to establish perceptions on quality of service from WASA, the respondents were first asked to indicate whether the amount of water they have is enough to satisfy their household needs. Perceptions of the amount of water available are shown in Table 5.9 below.

TABLE 5.9: Customer perceptions of the amount of water available for household use in Maseru, 2002

Sub-area	Enough		Not enough		Total	
	n	%	n	%	n	%
High income planned area	39	100	0	0	**39**	**100**
Middle to low income planned area	20	95	1	5	**21**	**100**
Old low income unplanned area	7	35	13	65	**20**	**100**
New low income unplanned area	6	30	14	70	**20**	**100**

As expected, a majority of households in the planned areas (that is planned high income area and planned middle to low income area) reported that their supply is adequate. Comparatively lower percentages of households that are satisfied with the amount of water available were recorded in the unplanned areas, (that is old unplanned low income area and new unplanned low income area).

The perceptions of customers of the amount of water available for household use was also investigated against the type of access that the household has. Table 5.10 shows the results.

TABLE 5.10: Customer perceptions of the amount of water available for household use against type of access in Maseru, 2002

Type of access	Enough		Not enough		Total	
	N	%	n	%	n	%
Tap in house	45	100	0	0	**45**	**100**
Tap in yard	13	96	2	4	**15**	**100**
Communal tap	13	35	24	65	**37**	**100**
Other	2	70	1	30	**3**	**100**

As the results indicate, all households with an in-house tap service perceived their water supply to be enough. This applies to a majority (96%) of households with an in-yard tap service. However, only 35% of households who use communal taps reported that they have adequate water. An interesting observation is that an unexpectedly high percentage (70%) of households who rely on other sources of water such as tanks, and neighbours' taps reported having an adequate amount of water. For those who use tanks the reason could possibly be that they always have reserve water in a tank, while for those who buy from their neighbour's tap it could be that they are never without water as long as they keep on paying the neighbour.

Respondents were further asked to mention how often their water supply services are cut or interrupted by WASA, and the outcome is illustrated in Table 5.11 below.

TABLE 5.11: Frequency of interruption of water supply by WASA in Maseru, 2002

Area	**Never**		**Once a month**		**Once a week**		**More than once a week**		**Total**	
	N	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
High income planned area	11	28	27	70	1	2	0	0	**39**	**100**
Middle to low income planned area	3	14	17	81	1	5	0	0	**21**	**100**
Old low income unplanned area	0	0	0	0	0	0	20	100	**20**	**100**
New low income planned area	0	0	14	70	6	30	0	0	**20**	**100**

None of the households in the high income planned areas and middle to low income area reported going without water for more than once a week. A majority of households in these areas (70% in the high income area and 81% in the middle low income area), reported that their water supply is only cut occasionally. In the old unplanned area however, all households reported frequently (more than once week) going without water. In the new unplanned area, none of the households reported that their supply is never cut. However, a comparatively higher percentage (30%) of households reported that their water supply is

often interrupted. This implies a less frequent interruption of water supply for planned areas, hence respondents in these areas feel that they have enough water to meet their household needs. It should also be remembered that it is in these areas that a majority of households have privately owned water supply systems. Therefore this means that these households never find themselves sharing or queuing for water, which is why they feel that their water supply is adequate. However, this does not imply that households in these areas are entirely satisfied with the amount of water they have.

Water supply for unplanned areas, on the other hand, seems to be interrupted very often, to the extent that households who rely on this for their daily water supply, feel that the water they have is not enough to meet their needs. In the same manner it is in these areas where a majority of households rely on public sources. This means that, because water supply systems are shared by a number of households, people often find themselves having to queue for water, hence why they feel that the water supply is inadequate. The question of equity in water provision arises here. The fact that water services are not fairly distributed and are controlled by households' economic status means that only those who can afford it are enjoying better service provision. Furthermore, if water provision is to be privatised to the individual households in these areas it will be pivotal that the provision of water is of a high quality.

5.4.3 Customers' perceptions of current payment in relation to service

In order to establish customer's perceptions of payment in relation to the quality of service that WASA provides, respondents were first asked whether they pay for their water supply, and Table 5.12 shows the outcome.

TABLE 5.12: Household payment / non payment for water supply in Maseru, 2002

Area	**Yes**		**No**		**Total**	
	n	**%**	**n**	**%**	**n**	**%**
High income planned area	39	100	0	0	**39**	**100**
Middle to low income planned area	13	62	8	38	**21**	**100**
Old low income unplanned area	4	20	16	80	**20**	**100**
New low income unplanned area	7	35	13	65	**20**	**100**

As results indicate, all households in the high income planned area pay for their water supply services, while this applies to 62% in the middle to low income planned area. Comparatively fewer households who do not pay for water services were observed in these two areas. On the other hand, only 20% of households in the old unplanned low income area, and 35% in the new unplanned low income area reported to be paying for their water services. Notably high percentages of households in the unplanned areas reported not to be paying for their water supply services.

In general it can be observed that most households who pay for their water supply services are in the planned areas. This is particularly so because almost all households in this area have private water connections, thus receiving direct individual bills, which oblige them to pay. In fact, as Table 5.13 below shows, 42% of the total sampled households reported that their main reason for payment is to prevent their supply being cut. These households feel that they have no choice but to pay for their water. However, it should be realised that this is not the only reason for payment. Other reasons for payment that were stated by the households that pay for their water supply services are outlined in Table 5.13 below.

TABLE 5.13: Reasons for payment for water supply service in Maseru, 2002

RESPONSE	**n**	**%**
It is the law, so I have to	4	6
So that my supply is not cut	27	43
So that WASA can recover cost of treatment and supply	20	32
To show responsibility as a citizen	3	5
The water is clean and treated	3	5
To thank WASA	4	6
Other	2	3
TOTAL	**63**	**100**

For the households that do not pay for water supply services, the main reason put forward by the majority is that the water is obtained from a public standpipe, and therefore involves no direct individual billing. This implies that these households are not paying because they do not feel obliged to pay for their consumption, and not necessarily because they cannot afford to pay.

In order to establish the perception as to whether it is fair to pay for water, especially in respect of the current level of service, the respondents were asked to state whether they think it is fair to be charged for water supply services. This was done to observe whether the issue of poor quality service would be put forward as one of the main reasons for non-payment. Table 5.14 below presents a summary of the responses. What is immediately striking is the wide variety of responses, all of which indicate the perception that it is unfair to pay for water given the current level of service. It should be realised, however, that this does not suggest that customers are totally unwilling to pay for the water that they use. For the households that felt that it is fair to pay for water the main reason put forward is that water supply is a service involving costs and therefore there is a need for cost recovery.

TABLE 5.14: Responses to non-payment for water and fairness issues in Maseru, 2002

RESPONSE	**n**	**%**
Water is plentiful in Lesotho therefore it should be free	18	40
Water is too expensive	7	15
Installation is too expensive	8	18
Water from WASA is not fresh	0	0
WASA service is generally poor	12	27
Everyone should pay	0	0
TOTAL	**45**	**100**

When confronted with the question of fairness of payment for a water supply service, most of the respondents were quick to comment on the need for WASA to improve its service to encourage them to pay. This further implies that for those who are willing to pay, poor level of service is a major problem. Some of the improvements suggested are listed below.

- Accurate billing and meter reading
- Notification before water is cut
- Repair of leakages in time
- Bills posted in time
- Constant pressure from taps

The general implication here is that people have no motivation to pay for services because of the poor service that they get from WASA. This again reflects badly on WASA and is an indicator of a need for service improvement.

5.5 CONCLUSION

To a large extent, water consumption is directly related to access to water. The fact that WASA currently serves only half of the population within its area of designation indicates inefficiency by the authority. The above data shows that this problem can be attributed to a number of issues, such as the poor tariff structure, the poor subsidisation method, and subsequently the poor service delivery. These problems suggest that WASA is not accomplishing its purpose as reflected in their mandate, which reflects badly on the authority. From a policy perspective, there is a need to review the subsidisation policy. This will enable the targeted beneficiaries, which are the poor, to benefit from such a policy.

From a policy perspective, it should also be noted that there is a need for improvement of access to water and for quality of service. Increased access will result in increased consumption. This will require that proper planning be done to expand water services, but also make it financially viable. Expansion of services should be coupled with awareness about sensible water consumption. From a management perspective, there is a need to provide public water in such a way that it can be measured in order to make payment possible.

The question of equity in water provision also needs to be addressed. Water services need to be fairly distributed within an area and not be determined by the ability to pay. The poor should be provided with a satisfactory service even if it is not a first class service. Furthermore, if water provision is to be privatised to the individual households in these areas, it will be pivotal that the provision of water is of a high quality. Achievement of the above will motivate consumers to pay for their water services. Table 5.15 shows a summary of the main findings from the above data analysis.

TABLE 5.15: Summary of the main findings

1.	Water consumption is directly related to access to water
2.	There is need to expand water services in order to improve access
3.	The tariff structure and the subsidisation structure are neither benefiting the targeted group nor WASA
4.	The quality of service from WASA is unsatisfactory
5.	There is need for fair distribution of water service points
6.	There is need to quantify the amount of water consumed, even from public service points, in order to enable payment

CHAPTER SIX: SYNTHESIS: RECOMMENDATIONS IN RESPECT OF POLICY FORMULATION FOR BETTER WATER PROVISION IN URBAN LESOTHO

The central question that this study addresses is the development of water provision and the policy guiding urban water provision in Maseru. This has been done through an analysis of background literature on the main aspects related to urban water provision in the developing world, such as population growth and urbanisation, and their impacts on a global level. These aspects were then analysed in the context of Lesotho, with specific reference to Maseru, the capital city. This was followed by an analysis of policy on urban water provision, which in turn was followed by the testing of some outcomes of the analyses. Against this background this chapter will first give an overview of the main findings of the study. This will be followed by proposals for policy formulation for better urban water provision in Lesotho. Although the study has been conducted in Lesotho, the proposals put forward in this study are not necessarily restricted only to Lesotho, but can be adopted for policy guidelines in other developing countries that are interested in improving their urban water provision.

6.1 SUMMARY OF THE MAIN FINDINGS

A number of key findings made in this study are outlined as follows:

6.1.1 Diminishing global water resources are threatening the ability to achieve adequate water provision

The first stage in studying water provision is to recognize that global water resources are finite and vulnerable, while world population continues to grow. As illustrated in Chapter Two, global water resources are threatened by depletion, pollution and, above all, by population increase. Diminishing global water resources are one of the critical issues that will adversely impact on water provision at community level. Chapter Two has further illustrated that this is particularly so in cities of developing countries that are characterised by high rates of urban growth that far outpace the provision of urban services.

6.1.2 Lesotho, particularly Maseru, has experienced rapid urban population growth

Even though the above problem has not been empirically tested, Chapter Three has evidently illustrated this. Since its independence, Lesotho has experienced high population growth rates in all its urban centres, with Maseru absorbing a greater proportion of the growth. As discussed in Chapter Two, urban growth in Lesotho occurs mainly as a result of rural migration to urban areas. Maseru, being the capital city, is the most developed of all the urban centres, and therefore also the one that has the highest level of urban services. These have resulted in the city attracting more people and therefore growing faster than all the other urban centres.

6.1.3 Urban growth in Maseru has not been coupled with expansion in water supply services

In an effort to satisfy the water needs of this population, the government of Lesotho has put a lot of effort into the development of water supply. However, as shown in Chapter Three, it has become apparent that this has not been sufficient, as the proportion of the population without water supply services is continuing to grow.

6.1.4 Urban water provision in Lesotho has been guided by ineffective policies

Failure to meet the water needs of the ever-increasing population can be blamed mainly on government policies. Firstly, as demonstrated in Chapter Four, the government of Lesotho has not allowed significant increases in water tariffs to ensure the financial sustainability of WASA. Secondly, in cases in which water is delivered through community taps, the costs are supposedly incurred by the government as a subsidy to the poor. However, the government has in most cases failed to pay bills, thus further increasing expenses on the part of WASA. Furthermore, a comparison of the ways in which water services are delivered to the rural areas and the urban areas, as outlined in Chapter Four, reveals that there is contradiction in policy. An example is the fact that in the rural areas where the majority of the population is poor, the policy is that a contribution is a prerequisite before a system can be installed, while in the urban areas water is provided freely from communal taps, and yet the government is not even certain that the beneficiaries are really the poor.

6.1.5 The urban poor are using less water than the recommended international standards for quantity

A majority of the population in urban Maseru has access to water, but in different amounts, depending on the major source for the household. As explained in Chapter One, access to water is determined by the adequacy, safety and convenience of the water supply. Investigation of these elements reveals that access to water is still insufficient for some households. These elements have been empirically tested in Chapter Five. In terms of adequacy, Chapter Five has proven that there are a significant proportion of households that do not have access to adequate water. This is particularly so when one looks at the recommended international standard of 30 litres per person per day. A majority of these households, as revealed in Chapter Five, are in low income, unplanned areas and use communal water as their major source of water. A general conclusion here is that a significant proportion of the poor households are still without adequate access to water and are using less than the recommended standard.

6.1.6 The urban poor do not have access to water at convenient distances

The element of convenience of a water supply system was also empirically tested in Chapter Five. As has been demonstrated, access to water increases as the level of convenience of a water supply does. The total mount of water used was high for households that had the convenience of a private water connection, whereas it was low for those who had to travel some distance to draw water. Furthermore, convenience of a water system also seemed to encourage increased use of water for luxury purposes, thereby further increasing total water consumption. A high proportion of people with high levels of convenience were in the high income areas. On the other hand, lack of convenience in some cases resulted in reduced per capita use, which implies a lack of access to water. A high proportion of people with inconvenient access were in the low income, unplanned areas. A general conclusion here is that it is the poor who do not have access to water within convenient distances from their dwellings. This often results in the use of water that is of an unacceptable quality, while the rich continue to use water for luxury purposes.

6.1.7 Public water consumption is not quantified and not paid for

As illustrated in Chapter Four and empirically verified in Chapter Five, water from the public standpipes that are meant to supply water for the urban poor, is free. Furthermore, the quantities of water consumed from these points are not recorded. This does not only deprive WASA of some income, but also encourages the misuse of water.

6.1.8 WASA is making an effort to ensure that water supplied to the public is of acceptable quality

The element of water quality, thus its safety, has been discussed in Chapter Three and Four. Chapter Three has demonstrated that safety of a water supply is directly related to the health status of the people, possibly resulting in water-borne diseases such as typhoid and diarrhoea if the water source is unsafe. Chapter Four further explained that WASA regularly monitors the quality of treated water that it supplies to people. However, data on the quality of a sample of treated water showed that the quality does not fully conform to the recommended standards. Even though the data was from a single random sample, the fact remains that poor quality water was distributed for consumption. The implication here is that the water supplied may be of unacceptable quality. A definite conclusion cannot be drawn with regards to quality, but the possibility of access to water being reduced by quality certainly exists.

6.2 RECOMMENDATIONS

The aim of this section is to put forward recommendations for policy formulation that can be adopted to improve the status of urban water provision in Lesotho.

6.2.1 Integrated Water Resources Management (IWRM) is the solution to sustainable water provision

There is a need to recognise and promote the coordinated development of water resources, thus Integrated Water Resources Management (IWRM) should be introduced in Lesotho in order to achieve sustainable water provision. Water provision is not only restricted to household services: it includes various other critical components, such as protection of the

resources that provide water for household needs, demographic aspects, and overall environmental dimensions (TAMS 1996a; Global Water Partnership 2000; UNEP 2001). It is therefore important to adopt a holistic approach that involves all relevant sectors if the present crisis of water security is to be addressed. This will create an enabling environment at national level for all issues affecting water provision to be addressed in an integrated manner. The need to incorporate IWRM in the national policy therefore cannot be over-emphasised.

6.2.2 Encourage decentralisation of development to other urban areas

As has been explained in the previous sections, rapid growth in Maseru is occurring as a result of centralised development. The process of decentralisation whereby development is transferred from the capital city to other urban centres, could encourage redistribution of urban services from Maseru to other urban centres within Lesotho, which in turn will encourage the redistribution of population to those centres. Decentralised development, as Ramanujam (1997) recognises, is an effective means towards achieving balanced regional development and ensuring equitable distribution of the benefits of development.

6.2.3 It is imperative that new water resources are developed to address the needs of the growing urban population

A number of national studies have already recommended that the government of Lesotho give serious consideration to providing additional secure supplies of water, particularly in the lowlands area where rapid urban growth is occurring (TAMS, 1996a). This is also in accordance with Chapter 18 of agenda 21, which emphasises the development of freshwater resources, which Lesotho has an obligation towards. However, it is worth mentioning that positive efforts are already being undertaken by the government of Lesotho to address this issue through the Lesotho Lowlands Water Supply Scheme. Financial investment through the European Union has already been secured, and a project feasibility study has been completed (Parkman Consultants, 2003).

6.2.4 There is a need for development of policies that encourage cost recovery, and equitable and sustainable access to water

Firstly, extensive literature has shown that the poor are willing and able to pay for water of good quality, quantity and access convenience. The subsidisation of water by providing free water from the communal taps has proven to be inefficient. To rectify the problem, firstly a system that encourages a minimum charge for water should be introduced. However, care must be taken to ensure all stakeholders' participation through consultations, in order to encourage acceptance. WASA must not impose ideas on consumers but must allow consumers to recommend the best possible ways to manage the systems. Management and maintenance of the system must also be undertaken by communities, as is the case in rural areas. This will not only enable WASA to recover its costs, but will also empower the communities. Secondly, a cost related tariff should be gradually introduced, to assist WASA to recover costs and to discourage high luxury consumption of water. This should focus mainly on high water consumers.

6.2.5 There is a need to increase water service points

As illustrated in Chapter Five, the convenience of location of a water source in terms of distance plays a vital role in determining access to water. There is a need to increase the number of water collection points within urban Maseru in order to meet the recommended international standard for quantity. This will not only bring water closer to the people, thereby encouraging increased water use, but it will also minimise the number of people per service point. Together with this, there will be need for awareness campaigns on sensible water use. The introduction of a minimum charge, as discussed in Section 6.2.4, should in effect boost WASA's financial status to enable the increase of water collection points and expansion of service to previously deprived areas.

However, it should be noted that increasing the number of service points might a difficult and expensive task due to the issue of urban sprawl as discussed in Section 3.1. As has been mentioned, the sprawl of urban settlements in Lesotho is not controlled. This results in increase in the cost of providing water services as households spread farther apart, while

government is forced to provide for these widely spaced plots often of irregular sizes and shapes.

6.2.6 Ensure even distribution of water service points

Another important issue to ensure expansion of service is the distribution of water collection points. An increase in number cannot be effective if the collection points are not evenly distributed within an area. There is a need, therefore, to allocate an appropriate number of people per collection point.

6.2.7. Public water consumption must be quantified to enable payment

The water from the public standpipes around Maseru must be paid for. This will enable WASA to recover at least part of the cost of supplying this water. However, the first step towards this is to devise a way of quantifying the amount of water consumed so that the charge can be based on the amount consumed. This will encourage sensible use of water.

6.2.8 The quality of water supplied must be closely monitored to ensure compliance with international standards

This must not only be done in Maseru, but in all urban areas. As has been mentioned, water provision is not only about quantity, but also about quality. Water of poor quality can markedly reduce access and put people's health at risk.

Table 6.1 below illustrates the relationship between the main findings and the recommendations.

TABLE 6.1: Relationship between main findings and recommendations

FINDINGS	RECOMMENDATIONS
Diminishing global water resources are threatening the ability to achieve adequate water provision.	Integrated Water Resources Management (IWRM) is the solution to sustainable water provision.
Maseru has experienced rapid urban population growth.	Encourage decentralisation of services to other urban areas.
Urban growth in Maseru has not been coupled with expansion of water supply services.	It is imperative that new water resources are developed to address the needs of the growing urban population.
Urban water provision in Lesotho has been hampered by ineffective policies.	There is a need for development of policies that encourage cost recovery, and sustainable access to water.
The urban poor are using less than the recommended international quantity standards.	There is a need to increase water service points.
The urban poor do not have access to water at convenient distances.	Ensure even distribution of water service points.
Public water is not quantified and therefore not paid for. WASA is making efforts to ensure that water supplied to the public is of acceptable quality.	Public water consumption must be quantified in order to enable payment thereof. The quality of water supplied must be closely monitored to ensure compliance with international standards.

6.3 VALUE OF THE RESEARCH

The value of the research can be motivated as follows:

- The research gives an insight into the status of urban water provision in Lesotho. This provides a platform to discuss possibilities for improvement of service provision, particularly to the urban poor. Although a number of consultancy reports have been completed in this regard, this is a first attempt to evaluate urban water provision in Lesotho from an academic point of view.

- Lesotho is a signatory to a number of international conventions, such as the following;
    - The World Summit for Sustainable Development (WSSD).
    - The International Conference on Water and the Environment (ICWE)
    - The Lesotho Highlands Water Project (LHWP)
    - The United Nations Millennium Development Goals

The research gives the country an opportunity to assess its achievements in meeting its obligations towards these principles.

- It contributes towards the refocus of development to the urban areas in order to minimize the rural bias that the country is experiencing. While it is true that the majority of the population in Lesotho resides in the rural areas, to where most development has been channelled, it is also true that there is a need for development in the urban areas. With the current population shifts that the country has been undergoing, there is going to be a need for more urban amenities, especially provision of water to the urban poor. Hopefully this will be a wake-up call for many administrators who still plan with a rural bias.

- The research has identified various shortcomings in water policy and water delivery in Lesotho and specifically the Maseru urban environment. It is hoped that the identification of these issues, and the fact that through this thesis these issues are brought to the fore, might contribute to better water policies in Maseru and Lesotho.

- The research provides a fairly comprehensive overview of the available literature on urban water provision and water provision in general in Lesotho. This literature list might be helpful to other researchers studying similar themes.

- The research has also identified a number of research possibilities that can be investigated in future (see Section 6.4).

6.4 FUTURE RESEARCH POSSIBILITIES

The following are future research possibilities that could further strengthen water provision in Lesotho;

- As this study was based on a fairly small sample it is suggested that a more comprehensive study in this regard (possibly for a doctoral thesis) should be undertaken.

- Although this study provided a broad background, the more in-depth sections of the study focused on Maseru. It is suggested that the same study is expanded to all urban areas in Lesotho.
- The research can be intensified to investigate the allocation of water for different sectors such as agriculture, industry as against the availability of the resource.
- A study can be made of the impact of climatic change on water resources and how the country can be safeguarded against the effects thereof.
- A comparison of water provision in Lesotho and in other countries in the sub-Saharan region can be done.

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SUMMARY

Title: Urban water provision in Maseru (Lesotho): A geographical analysis.

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Supervisor: Dr. JGL Marais

Water is the most important of all basic needs, and is fundamental to all vital processes of value to mankind. However, statistics indicate that of all the water available on earth, only a limited fraction is available for human consumption. With the growing world population, there is increasing demand for water worldwide.

The situation is even more complicated in cities of the developing world that are characterised by rapid population growth while the economic status is low. This often results in the demand for water growing faster than the ability to supply. Urban population expansion in the developing world therefore further complicates the challenge of water provision. This is a very critical issue because failure to meet the water demands of cities can put people's lives at risk. The main challenge therefore is to develop appropriate policies that guide water provision.

This is also the situation in Lesotho. Like other developing countries, Lesotho's population has been growing at an alarming rate. Most of the growth has been happening in the capital city Maseru, which absorbs a high share of the country's urban population. However, the fast rate of urbanisation in Lesotho, particularly in Maseru has not been coupled with the necessary expansion of water supply systems, thereby causing pressure of the existing system.

WASA the body that is charged with the responsibility of urban water supply in Lesotho has since its formulation generally failed to meet its obligation. This is as a result of ineffective policies that were put in place to guide the authority. About half of the population within WASA's area of designation are still unserved. Several policy related issues have resulted in this. Firstly, the subsidisation of water by disallowing price increases. Secondly, the supply

of free water through public standpipes, and thirdly the false assumption that the poor cannot afford to pay even the minimum charge for water. These issues have not only resulted in financial instability to WASA thus hindering service expansion, but have also resulted in denial of service to the poor while the rich enjoyed low cost service. Empirical examination of the situation on water provision in Maseru has further confirmed the issues discussed above. From a policy perspective it is therefore imperative that water supply services are expanded and improved to be financially viable.

OPSOMMING

Titel: Stedelike voorsiening van water in Maseru (Lesotho): ‘n Geografiese analise.

Kandidaat: Lifuo Molapo

Studieleier: Dr. JGL Marais

Van al die basiese behoeftes is water die belangrikste. Dit is ook fundamenteel aan al die lewensbelangrike prosesse wat vir die mensdom van waarde is. Die statistieke dui egter aan dat slegs ’n breukdeel van die beskikbare water op aarde vir menslike gebruik geskik is. Met die groei in die wêreldbevolking is daar wêreldwyd ’n toename in die vraag na water.

In die stede van die ontwikkelende wêreld, wat deur vinnige bevolkingsgroei en lae ekonomiese status gekenmerk word, is die situasie selfs meer ingewikkeld. Dit het dikwels die gevolg dat die vraag na water vinniger groei as die vermoë om dit te verskaf. Stedelike bevolkingsuitbreiding in die ontwikkelende wêreld kompliseer dus die uitdaging rakende watervoorsiening verder. Hierdie saak is van kritiese belang omdat ’n mislukking om in die watervraag van stede te voorsien, mense se lewens in gevaar kan stel. Die belangrikste uitdaging is dus om toepaslike beleidstukke, wat watervoorsiening rig, te ontwikkel.

Hierdie situasie doen sigself ook in Lesotho voor. Soos in ander ontwikkelende lande groei Lesotho se bevolking ook teen 'n kommerwekkende tempo. Die meeste van die groei vind in die hoofstad, Maseru, plaas. ’n Groot gedeelte van die land se stedelike bevolking woon hier. Die watervoorsieningstelsels in Lesotho, veral in Maseru, het nie teen dieselfde vinnige tempo as verstedeliking ontwikkel nie. Dit veroorsaak druk op die bestaande stelsel.

WASA, die liggaam wat verantwoordelik is vir die stedelike watervoorsiening in Lesotho kon sedert sy stigting nog nie hierdie verpligting nakom nie. Dit is die gevolg van oneffektiewe beleidstukke wat in plek geplaas is om die gesagsliggaam te rig. Ongeveer die helfte van die bevolking wat binne WASA se aangewese gebied val, het nog nie dienste ontvang nie. Verskeie beleidsverwante kwessies het hierdie situasie veroorsaak. Eerstens is

daar die subsidiëring van water deur ’n verbod op prysverhogings. Tweedens is daar die verskaffing van gratis water deur openbare pype. Derdens is daar die vals aanname dat die armes selfs nie die minimumkoste aan water verbonde, kan betaal nie. Hierdie kwessies het nie net finansiële onstabiliteit vir WASA meegebring, wat dus die uitbreiding van dienste verhinder het nie. Dit het ook daartoe gelei dat dienste van die armes weerhou is terwyl die rykes dienste te een lae koste geniet. 'n Empiriese ondersoek na die omstandighede rakende watervoorsiening in Maseru het die kwessies wat hierbo bespreek is, verder bevestig. Dit is dus vanuit ’n beleidsperspektief dringend noodsaaklik dat die waterverskaffingsdienste uitgebrei en verbeter word ten einde finansieel lewensvatbaar te wees.

ANNEXURE A

WATER PROVISION IN MASERU

A. BIOGRAPHIC AND SOCIO-ECONOMIC INFORMATION

1. Area: ……

2. Gender:

Male	1
Female	2

3. Age:……..

4. Number of household members: …….

5. Total household members:

No income Less than M500	1 2
Between M501 and M1000	3
Between M1001 and M1500	4
Between M1501 and M2000	5
Between M2001 and M2500	6
Between M2501 and M3000	7
More than M3000	8

6. Level of education:

None	1
Primary	2
Secondary	3
Tertiary	4
Vocational	5

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

8. Before coming in this area where did you live?.....

B. WATER AND SERVICES ACCESS

1. What is the main source of drinking water for the household?

Tap in house	1
Tap on site	2
Communal water tap	3
Other: specify	4

2. Type of sanitation facility available?

In house water-borne	1
Outside house water-borne	2
Improved VIP	3
Ordinary pit latrine	4
None	5
Other: specify	6

3. What type of house does the family live in?

Modern	1
Polata	2
Line flats	3
Apartments Traditional	4 5
Other: specify	6

4. What is the number of rooms of your house?

5. Are you connected to the electricity system?

Yes No	1 2

. WATER UTILISATION

1. How much water do you use per day?.....

2. How often do you use water for the following?

	Once per day	Once in 2 days	Once in 3 days	Once in 4 of more days	Never
Cooking	1	2	3	4	5
Bathing	1	2	3	4	5
Washing	1	2	3	4	5
Drinking	1	2	3	4	5
Watering garden	1	2	3	4	5
Flushing toilet	1	2	3	4	5
Washing hands	1	2	3	4	5
Washing car	1	2	3	4	5

3. Is the amount available enough for household needs?

Yes	1
No	2

4. How often is your main water supply interrupted?

Never	1
Occasionally (at least once a month)	2
Often (at least once a week)	3
Regularly (more than once a week)	4

D. AFFORDABLE AND WILLINGNESS TO PAY

1. Do you pay for the water that you use?

Yes	1
No	2

2. Give reasons for your answer …….

3. How much do you pay for water on a monthly basis?

Nothing	1
Less than M50	2
Between M51 and M150	3
Between M151 and M300	4
Between M301 and M500	5
Above M500	6

4. Do you think you should pay for water?

Yes	1
No	2

5. Give reasons for your answer……

E. WATER QUALITY AND HEALTH

1. The water that comes out of the tap is clean. Give your opinion.

Strongly disagree	1
Disagree	2
Neutral	3
Agree	4
Strongly agree	5

2. How often does someone in the household complain of the following?

	Once Weekly	Once Monthly	Once in 6 Months	Never
Diarrhoea	1	2	3	4
Stomach ache	1	2	3	4
Vomiting	1	2	3	4
Worms	1	2	3	4
Skin problems	1	2	3	4

3. Have there been cases of infant mortality in the household?

Yes	1
No	2

What is the most important developmental need in this area? ……..