STRENGTHENING CAPACITY IN STRATEGIC FINANCIAL PLANNING FOR THE WATER SUPPLY AND SANITATION SECTOR IN LESOTHO

REFERENCE: 9 ACP RPR 109-2 TD2LESOTHO

Final

Baseline, Affordability & Development Options Report

January 2010

Global Water Partnership

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Tsoelopele Consultants & Contractors Pty Ltd.

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Report Number 02

BASELINE REPORT

Final

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The documentation from the 'Strategic financial planning Project' consists of:

- **Report Number 01: Inception Report, Final, January 2009**
- **Report Number 02: Baseline report, Final, January 2010 (this report) includes in Chapter 4 report number 03: Affordability Report and in Chapter 5 report number 04: Development Options Paper.**
- Report Number 05: Strategic financial planning report.
- Report Number 06: Capacity development report.
- Report Number 07: Integration report.
- Report Number 08: Final report.
- Strategic Financial Planning Model for Lesotho.
- Feasible Model with Lesotho water sector data.
- Documentation CD with all data and documentation used in the assignment.

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List of Abbreviations

AWF	African Water Facility
BOS	Bureau of Statistics
Cap-Net	International Network for Capacity Building in IWRM
CC	Community Council (lowest level of local government)
COW	Commissioner of Water
COWI	Consulting Company from Denmark
DIS	District Information System – DRWS data base on RWS
DP	Development Partner
DWA	Department of Water Affairs
DRWS	Department of Rural Water Supply
EC	European Commission
EU	European Union
EUWI	European Union Water Initiative
FEASIBLE	Investment Planning Tool developed by OECD
FWG	Finance Working Group (of the EUWI)
GDP	Gross Domestic Product
GIS	Geographical Information System
GoL	Government of Lesotho
GWP-SA	Global Water Partnership – Southern Africa
IA	Irish Aid
IFIs	International Financial Institutions
IWRM	Integrated Water Resources Management
LHDA	Lesotho Highland Development Authority
LNDC	Lesotho National Development Corporation
LSL	Lesotho Loti (kLSL = 1,000 LSL, mLSL = 1,000,000 LSL)
LWSIMS	Lesotho Water Sector Information Management System
LLWSU	Lesotho Lowlands Water Supply Unit
LLWSP	Lesotho Lowlands Water Supply Project
LWP	Lesotho Water Partnership
MCC	Millennium Challenge Corporation
MDG	Millennium Development Goals
MIS	Management information System
MoFDP	Ministry of Finance and Development Planning
MNR	Ministry of Natural Resources
MDG	Millennium Development Goal
MTEF	Medium term expenditure framework

NGO	Non-governmental organization
NUL	National University of Lesotho
O&M	Operation and Maintenance
OECD	Organization for Economic Cooperation and Development
ORASECOM	Orange-Senqu River Basin Commission
PPSU	Policy Planning and Strategy Unit in the COW's Office
PRS	Poverty reduction strategy
PSC	Project Steering Committee
RIBASIM	water balance model developed as part of the IWRM strategy
RWS	Rural Water Supply
SADC	Southern African Development Community
SFPM	Strategic Financial Planning Model
SSA	Sub-Saharan Africa
SWAP	Sector Wide Approach to Planning
SWIFT	Investment Planning Tool developed by WSP for the Kenyan Water Sector
TOR	Terms of Reference
TWG	Technical working group
UfW	Un-accounted for Water
VIP	Ventilated Improved Pit latrine
WAP	Willingness and Ability to Pay studies
WASA	Water & Sewerage Authority
WB	World bank
WSP	Water Supply and Sanitation Programme
WSS	Water and Sanitation Services
WSSD	World Summit on Sustainable Development
WTP	Water Treatment Plant

1 EXECUTIVE SUMMARY

1.1 Introduction

The Ministry of Natural Resources (MNR) and its office of the Commissioner for Water (COW) in partnership with the Ministry of Finance and Development Planning (MoFDP) and other stakeholders have launched an initiative to strengthen the strategic financial planning in the water sector. This initiative is supported by the Organization for Economic Cooperation and Development (OECD) and European Union Water Initiative/ Finance Working Group (EUWI/FWG).

The strategic financial planning initiative is aimed at providing a transparent and long-term overview of the overall financial needs of the water sector in order to meet its targets. The tools developed will enable the sector to better manage any financial gaps through policy dialogue on sector strategies (how to increase sector efficiency and effectiveness) and through enhanced fund-raising and revenue generation.

This report is titled 'Baseline, Affordability and Development Options Report' and covers the planned outputs 02; 03 and 04. It documents the present status of the water sector in Lesotho and describes the baseline scenario, financing needs and available finance as well as possible policy measures that could close the financing gap.

The development of the planning tools including the collection and analysis of the baseline data has taken much longer than anticipated and therefore this report also includes the affordability analysis (Chapter 4 yet to be completed) and description of development options (Chapter 5) since the data collection on affordability issues and the discussions in the Technical Working Group (TWG) of the development options have taken place during this extended data collection period.

The Project is developing planning tools that within a timeframe until 2035 can:

- Estimate the financial needs for water services
- Estimate the available finance
- Thereby identify the funding gap if any and by changing policy variables such as targets, service levels and tariffs find ways of closing the funding gap.

Chapter 1 describes the methodology; the concept of linking the outputs from the project to the Medium term expenditure framework (MTEF) planning; the scope of the project, the planning tools as well as the data collection surveys that have been carried out to prepare the data foundation for the project.

The surveys included: i) the Water & Sewerage Authority (WASA) connection survey; ii) the peri-urban survey; iii) the rural private connections survey as well as iv) 'Willingness and Ability to Pay' (WAP) studies in the highland areas.

1.2 The WSS sector in Lesotho

The water services sub-sector is described in Chapter 2, the general geographical and water resource conditions as well as the policy and institutional dimensions; the socio-economic dimensions; the financial dimensions and the technical/ engineering dimensions

1.2.1 The Institutional Dimension

The institutional dimension describes the framework that provides the overall guidance to planning in the water sector: the Government's Vision 2020, the new 'Lesotho Water and Sanitation Policy' and its guiding principles and the Integrated Water Resources management (IWRM) Strategy based on guiding strategies from the Vision 2020 Malupe Strategy. The 'After Care Policy' provides additional strategic guidance to the rural water and sanitation sector.

The main components of the legal framework for water services include: the Water Act, 2008; the WASA Order of 1991; the Lesotho Environment Act, 2001; and the Local Government Act, 1997 (and Local Government (Amendment) Act, 2004); as well as international legal instruments[1].

The main institutional responsibilities for water and sanitation services in Lesotho are:

- Water and Sewerage Authority (WASA) responsible for water supply and sewerage services including services for emptying of septic tanks and pit latrines in the gazetted urban areas. Through projects e.g. Maseru Sanitation also involved in supporting the implementation of on-site sanitation facilities such as VIP Latrines.
- Department of Rural Water Supply (DRWS) is responsible for overseeing water and sanitation services in rural areas that are provided through community managed water schemes and support to on-site sanitation. An ongoing decentralisation process will lead to District Councils and Community Councils being responsible for supporting the communities and implementing new water and sanitation facilities.
- Lesotho Lowlands Water Supply Unit (LLWSU) for bulk supply of water to the densely populated areas in the lowlands of Lesotho has been designed and the implementation of the Zone 4 and 5 is ongoing covering Metolong dam, water treatment and transmission to Maseru and nearby centres. The Metolong Authority has been established to oversee the implementation;
- The Lesotho Highlands Development Authority (LHDA) is responsible for the operation and further development of bulk water transfer schemes from the highlands of Lesotho to the Republic of South Africa. The role of LHDA in water services in Lesotho is limited to implementation of rural water and sanitation projects in the catchment areas for the bulk water reservoirs and release of water to lowland rivers in periods of drought to alleviate water shortages in the urban water systems in particular Maseru.
- The Rural Sanitation Programme and the Health Education Unit under the Public Health in the Ministry of Health and Social Welfare has an important role in supporting hygiene education and promotion of sanitation in urban and rural areas.

1.2.2 The socio-economic Dimension

The socio-economic dimensions of the water sector are described by the overall planning frame for the Government of Lesotho as presented annually by the Ministry of Finance in the background to the budget.

The socio-economic development in Lesotho is characterised by gradual changing of the economic basis from the subsistence farming and animal husbandry in rural areas to manufacturing in urban areas resulting in rural-urban migration as well as development of the mining sector. In real terms, Gross Domestic Product (GDP) has grown by 4.4% per annum since 2002, with provisional national accounts data showing growth of 2.9% in 2008.

Over the five years 2008 - 2012, the annual average growth rate is expected to 4.8%. Since this rate of growth significantly exceeds the rate of population growth derived from the provisional 2006 Census data, it signals improvement in GDP per capita and it may be assumed that Lesotho will achieve a sustained reduction in the incidence of poverty. However, much of this economic growth will be generated by mining, which is a predominantly foreign-owned enclave industry, and the wider economic benefits are likely to be quite limited. Thus, Lesotho needs to explore ways of shifting to a faster and more broadly based economic growth path that creates more employment than currently projected.

Trends in the manufacturing industry are important for water demand projections. The previous growth in high water-demand textile industries is expected to be partly replaced by other types of manufacturing such as electronics with much less water demand.

The historical data on water consumption and the considerations on the industrial development point towards a substantial growth in the industrial demand but far below the growth percentages experienced in the early part of the decade. Possibly a growth at 3 – 5% would be reasonable depending on the scenario for

[1] such as the Lesotho Highlands Treaty, 1986; the SADC Revised Protocol on Shared Water Courses, 2000; the Orange-Senqu River Basin Commission (ORASECOM) agreement, 2000; the Southern African Development Community (SADC) Regional Water Policy,2006; and the SADC Regional Water Strategy,2007

development of industries. The commercial demand seems to follow the same trend as the industrial demand but with reduced fluctuation. Possible a growth of 2 – 3% would be reasonable to expect.

Table 1: Population Growth 1996-2006

Average Annual Population Growth 1996-2006	
Lesotho total	+0.21%
Urban areas total	+3.67%
Rural areas total	-0.65%
Lowlands	-0.75%
Foothills	-0.27%
Mountains	+0.46%
Senqu River Valley	-0.34%

The preliminary results of the 2006 population census showed that the population of Lesotho has been stagnating between 1996 and 2006 and this makes the detailed analysis of the census population data in particular important since it will change the previous demand forecasts for the water sector. In total the annual population growth has been only 0.21% between 1996 and 2006. The growth percentages are shown on Table 1 and the data per Community Council (CC) and Urban area are provided in Annex A.

The stagnating population in Lesotho is likely to be a combination of i) increased mortality due to the HIV/AIDS pandemic; ii) a high emigration rate of 2.6%[2] mainly to South Africa (93.5%) and; iii) decreasing birth rate

To establish a better planning foundation for the water sector in terms of population data, the project implemented the following activities:

- Printing of large scale maps based on aerial photos from the Geographical Information System (GIS) of the Bureau of Statistic (BOS) covering the WASA supply areas and each of the 120 Community Councils CCs);
- In cooperation with the WASA Area Managers delineating on the maps the areas covered by the existing reticulation networks;
- In cooperation with the Department of Rural Water Supply (DRWS) District Engineers marking the supply areas for the approximately 5,000 rural water supplies
- In cooperation with the BOS personnel in the GIS Unit analysing the population covered by the existing rural and urban water supply systems;
- Printing maps showing the gazetted urban boundaries as compared to the existing WASA supply areas (included in Annex H);
- Analysing the detailed census data on water and sanitation coverage according to the village list (more than 9000 villages) to provide the coverage data per WASA service area and each of the rural water supply service areas (ongoing)

The DRWS has provided additional resources required for printing of maps and analysis of rural water data to support the implementation of the project.

The demarcation of the urban boundaries compared to the present WASA networks revealed that the new urban boundaries in some of the towns include large areas with typical rural villages outside the present WASA networks. The service area maps are included in Annex H. This raises the issue of the willingness to pay for water services and the appropriate/ cost effective technology in rural areas versus the aim of WASA to generate an operating profit.

Coverage The definitions for access to water are described in the Sector Performance Framework. When the analysis of the BOS census data on water and sanitation facilities have been completed (likely by April 2010), this will provide the baseline for sanitation to be included in the DIS and it will provide a quality check on the DRWS data on rural water systems.

The water coverage in urban areas can be determined from the existing data in three different ways:

i. From the BOS: source of drinking water and collection time (<15 min collection time = within 150 m distance and limited queues)
ii. From WASA's data on number of public standpipes and domestic connections x persons per connection
iii. From population residing in areas covered by the WASA reticulation network

The data from BOS will give a picture of the water sources that people actually use while not providing the data specifically according to the coverage definition since it does not include quantity and quality.

The WASA data on connections will give a number of persons served, by assuming the average number of persons per connection (or the average consumption when also analysing the consumption data). This analy-

[2] Human Development Report 2009

sis is complicated by the fact that many households use other water sources such as rainwater to supplement the tap water.

The majority of the population within the areas covered by the WASA networks is likely to get water from the network (through own connections, illegal connections, buying from neighbours etc.) and therefore the population residing within the network area gives some indication of the coverage. This does however, with the available data, not include information on amount of water and collection distance since the network is not mapped accurately in relation to the settlements.

The table below shows the coverage estimates for rural and urban areas respectively based on the presently available data.

	Rural Areas						Urban Areas					
	Pop rural areas	Pop covered Community Schemes	Pop Served Community Schemes	Pop Served WASA Schemes	Coverage (WS exists)	Served (WS working)	Pop urban areas	Pop covered Community Schemes	Pop Served Community Schemes	Pop Served WASA Schemes	Coverage (WS exists)	Served (WS working)
Lesotho total	**1,454,803**	**851,397**	**666,468**	**17,052**	**60%**	**47%**	**484,630**	**29,794**	**27,028**	**219,401**	**51%**	**51%**
Botha Bothe	95,740	49,424	41,174	0	52%	43%	26,483	8,081	7,198	8,108	61%	58%
Leribe	229,192	121,978	107,045	2,627	54%	48%	57,074	2,018	1,943	22,365	43%	43%
Berea	177,252	129,484	96,538	3,845	75%	57%	19,022	267	267	9,980	54%	54%
Maseru	232,500	133,035	118,813	10,049	62%	55%	281,624	5,842	4,632	146,832	54%	54%
Mafeteng	166,252	111,293	60,203	0	67%	36%	33,483	1,097	940	13,378	43%	43%
Mohale's Hoek	152,481	90,800	75,102	0	60%	49%	25,947	3,696	3,546	5,492	35%	35%
Quthing	108,340	57,390	53,170	0	53%	49%	12,724	2,952	2,662	4,167	56%	54%
Qacha's Nek	61,984	44,211	36,137	0	71%	58%	11,306	3,805	3,805	2,942	60%	60%
Mokhotlong	98,775	55,397	36,157	0	56%	37%	9,851	878	878	4,321	53%	53%
Thaba Tseka	132,288	58,384	42,130	531	45%	32%	7,117	1,158	1,158	1,816	42%	42%

The baseline for sanitation coverage will only be available when the detailed analysis of the BOS data on water and sanitation has been completed according to the village list linked to the codes for DRWS and WASA service areas (expected April 2010). The present data from BOS on sanitation is from the 2003/03 household budget survey as shown below:

Percentage distribution of households by type of toilet facility and region

Type of toilet	Maseru urban	Other Urban	Rural Lowland	Rural Foothill	Rural Mountain	Rural SRV	Lesotho
No toilet	2.8%	14.2%	40.5%	56.6%	87.6%	67.7%	33.9%
Sewage system	14.4%	5.8%	0.1%	0.2%	0.2%	0.0%	4.4%
Own pit latrine	32.9%	26.3%	40.6%	27.1%	5.5%	11.0%	27.1%
Own VIP	30.7%	39.7%	17.4%	15.4%	6.2%	21.0%	26.2%
Public/ shared	19.0%	13.1%	0.3%	0.3%	0.0%	0.3%	7.8%
Other	0.1%	0.8%	1.1%	0.4%	0.4%	0.0%	0.7%
Total	100%	100%	100%	100%	100%	100%	100%

The coverage with sewerage systems for domestic waste disposal can also be deducted from WASA's data on sewerage connections showing considerably lower coverage estimates than the BOS data e.g. the coverage with sewerage in Maseru is only 2% as compared to the BOS statistics of 14.4%. The main reason for this is probably that the classification of 'sewage system' in the BOS survey includes the households using septic tanks.

The present water infrastructure data does not provide accurate data on urban coverage. To improve this in the longer-term, it would be needed to carry out GIS mapping of the urban water networks to determine the population within 150 m of the network. The connection survey started by this project should also be completed in order to provide accurate statistics on the number of persons served per connection and the amount of water used per person. It needs to be considered whether or not households that buy their water from neighbours at high cost should be regarded as covered.

The African Water Facility (AWF) project on the rural water and sanitation planning framework, when eventually implemented, will provide accurate data on the rural water coverage since the project is expected to include GIS mapping and updating of the capacity and other information on the water infrastructure as well as sanitation facilities. The GIS mapping will enable accurate determination of population data when integrated with the BOS GIS.

1.2.3 The Financial Dimension

The government and donor funding to the water sector is shown in the table below. The water sector funding is presently approximately 20% of the total government capital budget and corresponds to about 2.4% of the GDP.

Cost Centre/Project	2007/08	2008/09	2009/10	2010/11
Recurrent Estimates (mLSL)	**23.98**	**25.86**	**27.69**	**29.61**
Capital Estimates (mLSL)	**260.72**	**316.32**	**392.07**	**371.38**
Total 'Water Services' Budget (mLSL)	**284.70**	**342.18**	**419.75**	**400.99**
GOL Recurrent Budget Total	4,404.40	5,375.22	5,740.39	6,153.32
GOL Capital Budget Total	1,924.21	2,157.13	1,978.72	1,635.14
'Water Services' as % of total GOL Recurrent	0.54%	0.48%	0.48%	0.48%
'Water Services' as % of total GOL Capital	13.55%	14.66%	19.81%	22.71%
'Water Services' as % of total GOL	4.50%	4.54%	5.44%	5.15%
GDP	11,777.80	13,979.00	15,022.00	17,005.00
Water Sector Budget as prop of GDP	2.4%	2.4%	2.8%	2.4%

The present level of funding to the water services is 4.5% of the total GOL budget, a small proportion of 0.5% of the recurrent budget and a considerable proportion of 13.5% of the capital budget raising to 22.7% in 2010/11 mainly due to the considerable funding from the World Bank (WB) and European Union (EU) for urban water and sewerage and the coming MCC funding to the water sector.

The historical data seems to indicate that the GOL is directly contributing approximately 50% to the capital budget. The estimate above of the available funding includes an estimated contribution of 1.0 mLSL per year by the Local Authorities to rural water and sanitation services. The Local Authorities are using some of their development funding for rural water systems, both new investments and support to communities for maintenance and major breakdowns.

In addition to the funding listed above, WASA generates operating profit of approximately 10 mLSL annually that is utilised for investments in infrastructure such as network extensions and replacement of equipment.

In addition to the 'on-budget' funding there is also some 'off-budget' funding especially to the rural water sector from NGOs. In the DRWS DIS estimated to approximately 1.0 mLSL per year.

The investments by private individuals in 'self supply' should also be taken into account to get a more complete picture of the investment flows for water services. According to the surveys in peri-urban areas 7% have supply from own borehole and from the WASA connection survey indicates that 8% use own borehole water to supplement the WASA supply. A larger proportion of approximately 30% of households supplement the utility water supply with rainwater harvesting. This represents a considerable investment in 'self supply'. It is however complex to take self supply into account when analysing the investment requirements in terms of coverage targets since these investments overlap with the public investments in that it supplements the public water supplies mainly in order to provide higher service level or security of supply.

Private investments in water supplies to serve communities or sections of towns does not seem to be prevalent in Lesotho except on a small scale where one household invests in a borehole supply and sells water to neighbours. As revealed by the peri-urban survey this is case for 7% of the households serving 11% of households in peri-urban areas. In this case the investment is not done in the community water services as such but more as a by-product of investing in water supply for self supply.

1.2.4 Technical/ Engineering Dimensions

The technical aspects of water and sanitation services in Lesotho are described in Chapter 2.4 under the headings 'Urban Water', Urban Sewerage', 'Rural Water and Sanitation' and the planned 'Lowlands Bulk Water Schemes'.

Urban Water: WASA operates piped water systems in 15 major centres using surface or groundwater sources with various levels of treatment. The schemes range from a capacity of 65,000 m^3/day in Maseru to the smaller systems with capacity of approximately 300 m^3/day. Many of the urban water systems have operational problems as indicated by low capacity utilisation combined with interrupted water service in many of the systems. Levels of Un-accouted for Water (UfW) in the WASA systems are moderate to high ranging from 21% to 44%.

Urban Sewerage: WASA operates sewage collection systems and treatment plants in most of the urban centres. Only Peka, Semonkong and Qacha's Nek does not have sewage systems. The sewerage systems typically serve the commercial centres of the towns and has little domestic coverage. Only 10% of the sewerage discharge billed by WASA is from domestic sources. The use of coverage (the proportion of the population served for domestic purposes) as a measure for sewerage services is therefore not always appropriate.

The effluent from industries in Maseru does not all enter the WASA sewerage system. The water supplied to industries is approximately 11,000 m^3/day while the sewerage volume billed from the industries is only 1,200 m^3/day or 10% of the water consumption. Portion of the industrial discharge that does not enter WASA's system is treated on site by the industries but a large proportion flows untreated into the water courses.

Rural Water supplies in Lesotho are typically simple piped water systems serving individual villages. Where possible gravity systems are built, using water sources above the village, or where that is not possible pumping systems are installed from either boreholes or springs using diesel, electrical or solar pumps. These small systems typically serve between 200 and 2000 people. In addition to the piped systems, approximately 25% of the rural population with access to potable water is served by hand pumps. These are mostly located in the lowlands communities.

It is anticipated that in the future DRWS will utilise streams and simple treatment plants to satisfy the water demand in more densely populated areas. The bulk water systems planned for the lowland areas of Lesotho will cover some of the rural settlements with populations over 2,500. The existing water systems in the densely populated lowlands are typically in need of rehabilitation for various reasons.

The second priority for the rural water sub-sector is to reach the un-served villages that are typically in the more remote mountainous areas of Lesotho. Larger communities in easily accessible areas have in the past been given priority, leaving the smaller more remote communities without adequate water and sanitation facilities. Provision of better infrastructure including water and sanitation in these communities will potentially contribute to reducing migration to the urban areas and the resulting high levels of unemployment. The implementation unit costs in these remote villages are considerably higher than in the lowland villages, due to i) the size of the schemes and ii) the transport costs.

Lowlands Bulk Water Schemes: Recognition the importance of providing adequate water supplies to the domestic and commercial consumers in the Lowlands of Lesotho, the GOL carried out a feasibility study for the Lesotho Lowlands Water Supply Project (LLWSP) in 2004 and subsequently the design of the five bulk water supply schemes serving eight designated water demand zones. The purpose of the proposed LLWSP to improve water supplies to the lowland settlements with populations in excess of 2500 for domestic, institutional and industrial purposes. The aim of the project is to support the introduction of technically, economically, socially, environmentally and financially viable, bulk-treated water supply systems.

The main project components include intake points, water treatment works, pump stations and reservoirs and transmission pipelines. The bulk water schemes will feed the existing reservoirs and reticulation systems in the urban areas and rural villages.

1.3 The Baseline Scenario

1.3.1 Planning Tools

The planning estimates are developed using two tools:

1. The FEASIBLE planning tool is a computerised decision support tool developed by OECD and COWI. The FEASIBLE Version 2.4 enables analysis of Water supply, Wastewater collection and treatment and Municipal solid waste management.
2. The Strategic Financial Planning Model (SFPM) is a tool for estimating the financing needs versus available funding in the water and sanitation services sub-sector in Lesotho for different development and policy scenarios.

The results presented below are prepared by the SFPM. A brief description of the tools is provided in Chapter 3.1. FEASIBLE results will be presented in the Strategic Financial Planning Report. Detailed User Guidelines are available for the FEASIBLE and user guidelines will be prepared for the SFPM before the completion of this project.

1.3.2 Financing Needs to Reach Targets

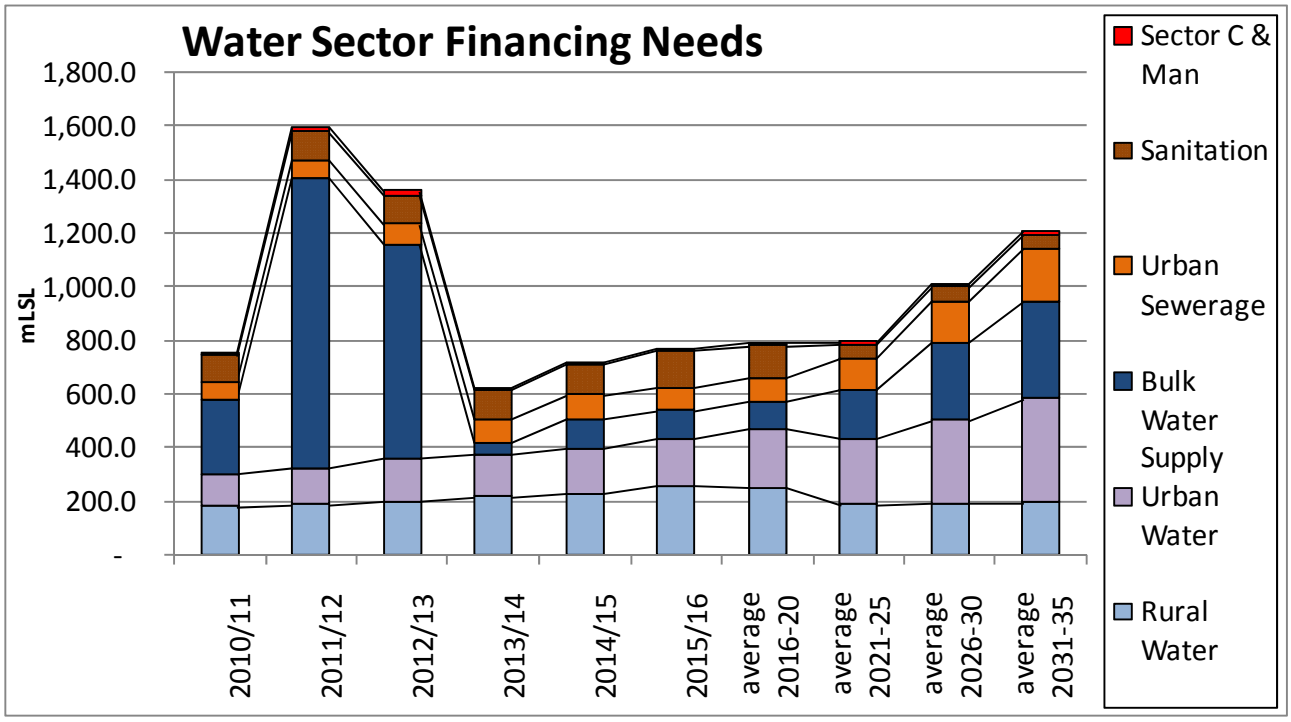
The results presented below are preliminary estimates based on incomplete population data and should therefore at this stage only be taken as an illustration of the type of outputs and analysis that is possible in the SFPM.

The results are presented in Chapter 3 for the following sub-sectors: Rural Water; Urban Water; Urban Sewerage; Bulk Water Supply and rural and urban sanitation.

The baseline targets are based on the present targets in the sector: 75% coverage by 2015 (Millennium Development Goals (MDGs)) and 100% coverage by 2020 (Vision 2020) for both rural and urban water and sanitation.

The total financing needs for the water and sanitation services are presented in the table and figure below. An allocation has been estimated for the funding needs for 'Sector Coordination and Management' based on the present recurrent budgets for the office of the COW projected in proportion to the total investment needs in the sector. These estimates can also be improved when the water sector strategies give clear directions on the future activities in relation to coordination and management of the water services sub-sector e.g. the cost of regulation etc.

Sector Financing Needs (mLSL) - Scenario 1	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	average 2016-20	average 2021-25	average 2026-30	average 2031-35	**Total 2010-35**
Rural Water	179.6	187.5	199.3	217.5	226.0	257.5	250.0	188.5	192.3	194.1	**5,392.0**
Urban Water	118.9	134.1	162.7	158.0	171.0	173.5	221.6	246.7	311.0	388.6	**6,758.4**
Urban Sewerage	62.5	67.6	77.4	88.9	88.4	87.0	88.1	114.7	156.8	199.1	**3,265.4**
Bulk Water Supply	282.6	1,083.7	794.3	41.9	111.3	107.1	100.9	182.9	286.1	358.5	**7,062.7**
Sanitation	101.5	104.8	108.1	111.4	114.7	137.2	120.4	53.3	53.3	53.3	**2,079.4**
Sector C & Man	8.7	18.5	15.7	7.2	8.3	8.9	9.2	9.2	11.7	14.0	**287.8**
Total	**753.7**	**1,596.1**	**1,357.4**	**624.9**	**719.7**	**771.2**	**790.3**	**795.3**	**1,011.2**	**1,207.7**	**24,845.7**



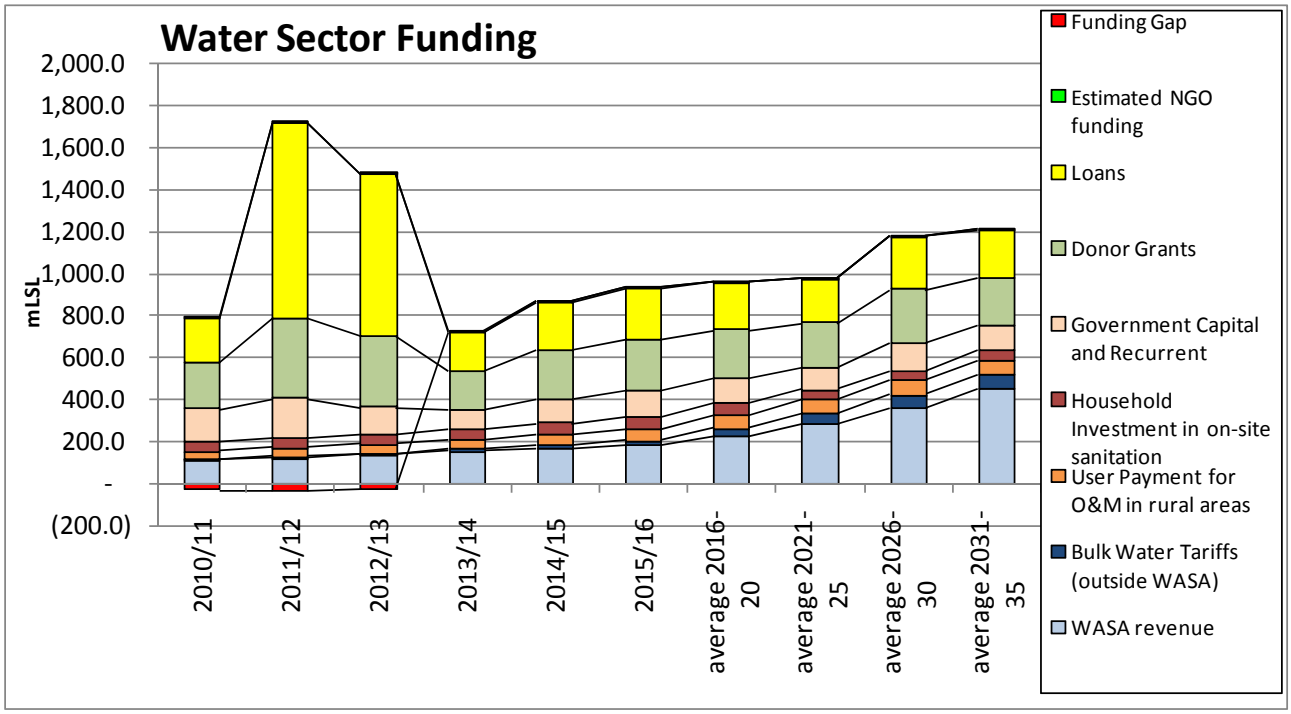
The investment needs are dominated by the Metolong project that is under implementation and will supply Maseru, Teyateyaneng, Roma and Morija and the larger rural settlements in the supply area. The estimates are presented as the total costs including the Operation and Maintenance (O&M) costs in order to show the total financial flows in the sector and present not only the funding for investment requirements but also the users contributions to the sector in terms of payment of tariffs and part of the O&M costs for rural water supplies.

1.3.3 Available Finance

Estimates over the available funding for water services are shown below. The estimates show the user payment of WASA tariffs in the urban areas and preliminary estimates of the Bulk Water Charges for water supplied to rural communities as well as the payments by the rural communities for O&M costs. The government/ donor funding is according to the budgets for the current MTEF planning period.

The data presented below shows that presently there is adequate funding for the sector to achieve targets, however the present level of both loan and grant funding is un-usually high due to the Metolong Project and substantial grant funding from the the Millennium Challenge Corporation for the water sector.

Total Sector Funding (mLSL) - Scenario 1	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	average 2016-20	average 2021-25	average 2026-30	average 2031-35	**Total 2010-35**
WASA revenue	114.8	126.6	139.5	153.7	169.2	182.4	223.2	283.3	363.1	455.2	**7,510.0**
Bulk Water Tariffs (outside WASA)	1.2	2.3	5.1	10.4	16.2	23.0	39.0	49.7	58.7	61.3	**1,101.6**
User Payment for O&M in rural areas	39.2	40.9	42.7	44.9	47.8	51.0	61.2	67.7	70.3	71.2	**1,618.7**
Household Investment in on-site sanitation	46.9	49.2	51.5	53.9	56.2	65.4	61.8	47.3	47.3	47.3	**1,340.9**
Government Capital and Recurrent	156.4	188.2	125.8	92.3	115.7	122.7	115.9	106.6	128.7	115.6	**3,135.1**
Donor Grants	219.0	383.2	341.1	184.6	231.4	245.3	231.8	213.2	257.3	231.3	**6,272.6**
Loans	214.4	930.1	772.6	184.6	231.4	245.3	231.8	213.2	257.3	231.3	**7,246.4**
LG Funding	1.1	1.1	1.2	1.2	1.3	1.3	1.6	2.0	2.5	3.2	**53.6**
Estimated NGO funding	1.0	1.0	1.1	1.1	1.1	1.1	1.2	1.3	1.5	1.6	**34.3**
Total Sector Funding	**793.9**	**1,722.7**	**1,480.6**	**726.7**	**870.4**	**937.5**	**967.3**	**984.4**	**1,186.5**	**1,218.1**	**28,313.3**
Sector Financing Needs	753.7	1,596.1	1,357.4	624.9	719.7	771.2	790.3	795.3	1,011.2	1,207.7	**24,845.7**
Loan repayment/ interst	13.5	96.2	101.8	101.8	150.7	166.3	177.0	189.1	175.3	10.4	**3,389.2**
Funding Gap	**(26.7)**	**(30.3)**	**(21.4)**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**(78.4)**



1.3.4 Financing Gap and possible Policy Measures to Bridge the Gap

The estimates above show that substantial public funding (government, donor grants and loans) are needed to achieve the 2020 targets of full coverage. The measures that could be considered to achieve this:

- Adjusting the WASA tariffs to provide full cost recovery for urban water services – adjustment of the WASA tariffs especially needed if the higher tariff for bulk water supplies is maintained. This will be further analysed in light of the willingness to pay and affordability studies in the Strategic Financial Planning Report.
- Improve the operating efficiencies of the urban water services by investing more aggressively in replacement of old pumps, reducing the UfW and use of efficiency measures such as pre-paid metering
- The level of government/ donor funding should be further discussed. The government predicts considerable increases in the GDP and this should make more funding available from the government revenues to water sector improvements. On the other hand, presently the water services are allocated

close to 20% of the government's capital budget and this is probably more that what can be expected in the longer term when the investments in the Metolong Dam and Water Treatment Plant (WTP) is completed.

- The prospects for private investments in the water sector in Lesotho beyond the investments in self-supply (that to some degree is overlapping with the public water supplies) could be considered. Areas of relevance could be for productive uses in areas outside the areas supplied by the bulk water schemes. However presently the scope does not seem very significant compared to the overall sector funding requirements.

The analysis in both the SFPM and the FEASIBLE will be further refined and prepared for the different development scenarios to illustrate the possible ways the water services sector can develop.

1.4 Affordability Analysis

1.4.1 Review of Existing Studies

From the assessment of the existing WAP studies, a wealth of information on willingness and ability to pay already exists, especially in the lowlands, which in these studies also include parts of the Foothills and Senqu River Valley regions. This information will provide requisite input data for the current study. To complement the existing data and have information on the whole country, the WAP study have been done in the highlands in tow urban and two rural areas.

1.4.2 WAP Studies in the Highlands

WAP studies were carried out in peri-urban and rural areas in Thaba Tseka and Qacha's Nek districts. The analysis indicate that despite the low capacity that the surveyed households have to afford water and sanitation services payments, the households appreciate that the services have to be paid for as expressed in their willingness to pay for different categories of services and responses to attitudinal statements. The majority of the households without direct access to water are already paying for it anyway. It is therefore clear from the analysis that the households are committed to paying for water and sanitation services, especially as long as water supply can be reliable and within close reach.

It is therefore recommended that where system costs are prohibitive (e.g. water connection fees), government should subsidize installation of such systems to reduce the cost burden from the consumers. But from the analysis, the consumers will be able to pay water monthly bills and system maintenance costs.

1.5 Development Options

1.5.1 Development Vision

The overall guidance for development options shall be the Government of Lesotho's planning documents such as the poverty reduction strategies (PRS) and the Vision 2020 and the targets implied in the MDGs. Within the overall scope set out by these documents, as described in Chapter 2.1, there can be different development scenarios that can be explored to analyse the possible options for the development of the water services sub-sector. The planning documents sets the overall targets for the water services in terms of coverage – 75% by 2015 and 100% by 2020 for water and sanitation in both rural and urban areas for water and sanitation.

1.5.2 Development Scenarios

Within the overall frame set by the Vision 2020, the development of water services in Lesotho could be analysed according to the following four scenarios:

1. Business as usual - showing the investment requirements and development in the sector should the development indicators that have been prevalent over the last years continue in the future
2. High Growth with Urban and Industrial Focus – showing the investment requirements and development in the water services sector should the drive to further industrialise the Lesotho economy succeed
3. High Growth with Rural Development Focus - showing the investment requirements and development in the water services sector should development be more balanced between the rural and urban areas

4. Low Growth - showing the investment requirements and development in the water services sector should the unfortunate situation arise where the Lesotho economy for various reasons does not achieve the desired economic development targets to reduce poverty.

The intention of the scenarios is not to choose *'one winner'* as the best representative of future development, but to allow the planning tools to show the consequences for the water sector investments and financial requirements depending on the different development possibilities.

These development options are intended to guide the development of the SFPM to include the appropriate technical and policy variables. Eventually, when preparing the financing strategy, the analysis might result in the development of a most likely compromise scenario that can be presented as a possible picture for the development of the water services. Some of the aspects such as irrigation and catchment management investments would only be possible to describe when possibly in the future the water sector would further develop the planning tools to cover the full IWRM scope.

1.5.3 Development Options

Within the four development scenarios there are specific development options to be considered to improve the water services and/or the financing of the sector. These have been identified and discussed in the TWG. Examples of these are:

Urban water:

- Comprehensive programme on calibration and replacement of old water meters
- Specific programme on zoning and metering supply areas to identify and reduce UfW
- Improved customer registration by e.g. GIS mapping of connections and collection of information on the use of water to reduce illegal connections and improve the data foundation for planning
- Improved management of groundwater sources – especially important with the substantial new investments in borehole sources in Maputsoe, Teyateyaneng and Roma
- Increased connection rates by e.g. making it less expensive or free to connect and collect the cost of connections over the tariff (the prepaid cell-phone model)
- Management of the existing rural water supplies within the urban boundaries needs to be considered – continued support from DRWS until WASA services cover the communities or integration into the WASA operations. Technology options for supplying these rural communities within the urban boundaries

Urban Sewerage:

- Introduction of other on-site technologies than Ventilated Improved Pit latrines (VIPs) e.g. Eco-San or pour-flush toilets

Rural Water and Sanitation:

- Investment in long-term planning of regional water schemes in the foothills including systematic monitoring of possible water sources
- Subsidising rainwater harvesting as supplements to community water supplies to provide higher level of service or compensate for inadequate water sources
- Improved planning and coordination with Local Authorities and development of a common financing mechanism for supporting rural water and sanitation
- More emphasis on developing capacity in Local Authorities and community structures for management, operation and maintenance to reduce the non-functioning supplies
- Options for sanitation technologies other than the VIP latrines

Lowlands Bulk Water Supplies:

- Models for supply to rural communities – supply into existing reservoirs using the existing distribution systems and community management of the payment for water or development of separate distribution networks for private connections
- Use of highland water resources for the lowlands when the water sources for the present schemes are inadequate.

Free Basic Water

In addition, there are options to be considered for how to implement the policy principle of free basic water for households that cannot afford. Some of the issues to consider include:

- In the WASA supply areas, vulnerable households could be provided with a pre-paid or post metered connection (paid by Government or through cross-subsidy for high-consuming customers) and receive a free allocation each month
- It does not make an impact to provide free basic water for the households that are already connected and receive water at a subsidised rate of the households that do not have a connection have to pay far more for a lower standard of service – e.g. by buying from neighbours
- In community managed rural water systems the Local Authorities could provide contributions to O&M costs for the vulnerable households
- Clarification is needed on how the vulnerable households are identified

2 INTRODUCTION

This Chapter provides a description of the Financial Planning Project, the agreed scope of the project, the choice of planning tools as well as the data collection surveys that has been carried out as part of the project and some highlights of the results. It also presents the aims of integrating the results of the strategic planning process into the Government's general planning and budgeting processes.

2.1 The Financial Planning Project

The Ministry of Natural Resources (MNR) and its office of the Commissioner for Water (COW) in partnership with the Ministry of Finance and Development Planning (MoFDP) and other stakeholders have launched an initiative to strengthen the strategic financial planning in the water sector. This initiative is supported by the Organization for Economic Cooperation and Development (OECD) and European Union Water Initiative/ Finance Working Group (EUWI/FWG).

The strategic financial planning initiative is aimed at providing a transparent and long-term overview of the overall financial needs of the water sector in order to meet its targets. The tools developed will enable the sector to better manage any financial gaps through policy dialogue on sector strategies (how to increase sector efficiency and effectiveness) and through enhanced fund-raising and revenue generation. The intention is that these tools and methods will become embedded into the sector financial planning routines and link closely to the Medium Term Expenditure Framework (MTEF) process. This effort will also contribute to global efforts to develop generic tools for strategic financial planning. It will do this by testing tools already developed such as FEASIBLE and the Water and Sanitation Programme (WSP) Unit cost tool and it will also test paradigms for country specific tools.

Following extensive discussions between the Government of Lesotho (GoL), the OECD and the EUWI/FWG a set of Terms of Reference (TOR) were developed which envisaged 4 phases of work and a number of reporting outputs. A firm of consultants[3] was selected and the assignment began in October 2008.

According to the TOR the project will be implemented over 4 phases:

i. Data collection (November 2008 – March 2009) ;
ii. Development options (February – May 2009);
iii. Financing strategy (May -July 2009) and,
iv. Integration of findings (August – September 2009).

The reporting outputs will be:

- Report Number 01: Inception Report, Final, January 2009.
- Report Number 02: Baseline report (this report) combined with report number 03 Affordability report (Chapter 4) and report number 04: Development options paper (Chapter 5)
- Report Number 05: Financing strategy report.
- Report Number 06: Capacity development report.
- Report Number 07: Integration report.
- Report Number 08: Final report.
- Strategic Financial Planning Model for Lesotho.

[3] The consultancy input is provided by PEMconsult a/s, Denmark in cooperation with TCC – Tsoelopele Consultants & Contractors (Pty) Ltd.

- Feasible Model with Lesotho water sector data.
- Documentation CD with all data and documentation used in the assignment

This report is titled 'Baseline, Affordability and Development Options Report' and covers outputs 02; 03 and 04. It documents the present status of the water sector in Lesotho and describes the baseline scenario, financing needs and available finance as well as possible policy measures that could close the financing gap.

The development of the planning tools including the collection and analysis of the baseline data has taken much longer than anticipated and therefore this report also includes the affordability analysis (Chapter 4) and description of development options (Chapter 5) since the data collection on affordability issues and the discussions in the Technical Working Group (TWG) of the development options have taken place during this extended data collection period.

Capacity Development

The aim of the capacity development activities of the strategic financial planning project is to ensure that the planning tools and methodology will become an integrated part of the planning process in the water sector. This is achieved by combining practical hands-on participation in the development of the planning tools with specific training sessions on relevant aspects as identified in the process. The TWG has received training in the use of the FEASIBLE tool by COWI, the developers of the tool. The capacity building activities will be described in detail in Report number 06 and 07 'Capacity Development and Integration Report'.

The methodologies and tools developed by this strategic financial planning project are only likely to be sustained if the use of the tools is embedded in the existing/ future planning procedures in the sector institutions. Embedding of the strategic financial planning in the institutional set up of Lesotho will require: explicit allocation of resources and responsibility, clear chains of accountability linked to institutional mandate and adjusted job descriptions where relevant and sustaining of relevant inter-agency communication channels.

The capacity building activities have been regarded as an integrated part of the design of the tools and the planning processes. This has implied that the data requirements for the SFPM are structured according to the existing planning tools such as the WASA Financial Model, the DRWS District Information System (DIS) and the modelling done as part of the LLWSP detailed design.

2.2 The Strategic Financial Planning Methodology

Strategic guidelines

In line with the TOR, the main approach is guided by:

- A recognition that the institutional embedding of the strategic financial planning and capacity building are crucial to the success of the project. Therefore a combination of a 'learning by doing' approach and seeking means of providing off the job professional development type training has been used;
- Contribution to the ongoing policy dialogue and add value to the SWAP process;
- The TWG will be formally responsible for the project execution;
- The consultancy support will be responsible for providing analytical and capacity building inputs.

Strategy financial planning methodology

The strategic financial planning methodology will consist of 3 interrelated processes:

- Derivation of an expenditure forecast based on macro-economic forecasts and characteristics of sector demand;

- Derivation of available sector finance based on macro-economic forecasts and characteristics of sector supply;
- Derivation of financing gap and a process for adjusting demand and supply factors to manage the gap in financing.

This methodology is outlined in Figure 1. The existing coverage and facilities (data) when combined with considerations of coverage targets over time (policy and technical variables) and the overall macro-economic context will provide the basis for an expenditure forecast, both capital and recurrent.

The Sources of potential finance combined with the rules governing public transfers and user charges (technical and policy variables) and the overall macro-economic context will provide the basis for a projection of available finance, both capital and recurrent.

The difference between the expenditure forecast to meet targets and the projection of available finance arising from the rules and sources of finance result in a financing gap (or surplus) this can then be managed by changing the "variables" within the demand side and supply side. These variables will be both policy variables e.g. coverage targets and tariffs and technical variables e.g. specifications, technology mix, unit costs. This iterative process will allow different scenarios to be developed and provide an evidence based policy decision support.

Figure 1: Strategic Financial Planning Methodology

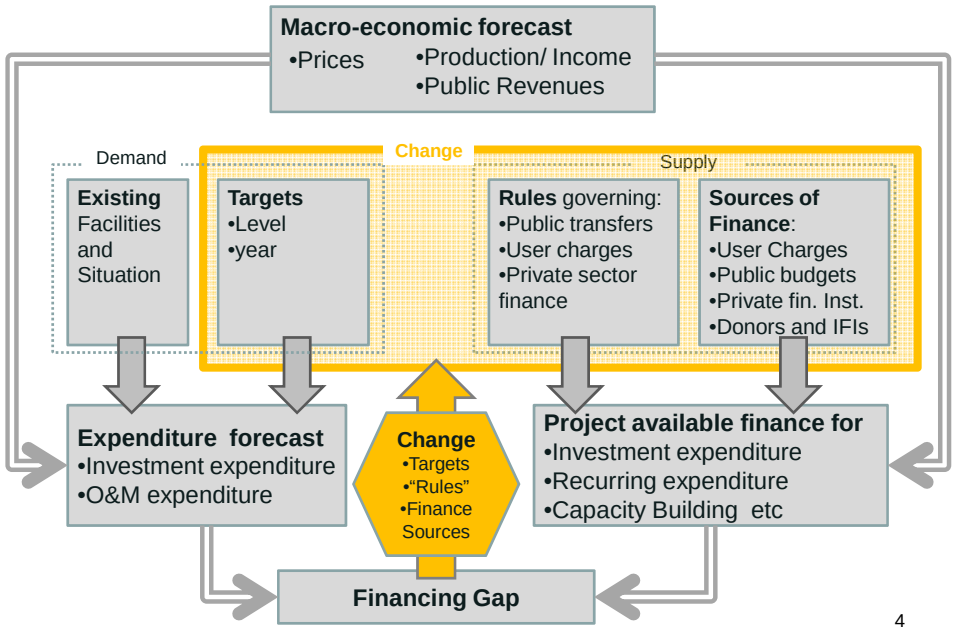
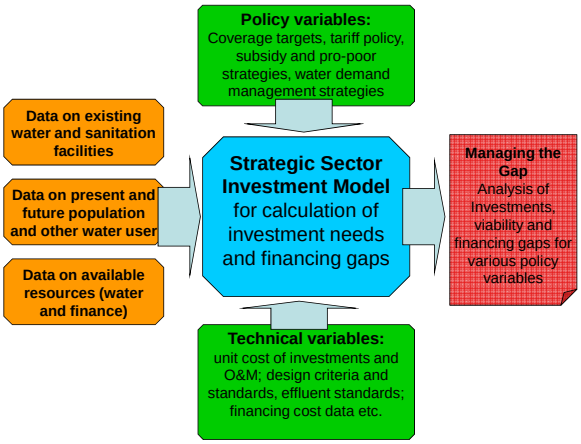


Figure 2: Estimating Model Structure

The overall structure of the model is illustrated on Figure 2.

The strategic financial planning model will in this way rely on the following inputs:

- Data on existing facilities, population and available financial resources;
- Definition of policy variables such as the tariffs, the desired



target coverage, subsidy policies and water demand strategies;

- Definition of technical variables such as unit costs (both capital and for O&M), technology mix, design criteria, level of standards, effluent standards, financing cost data.
- These variables can then be changed as part of the managing the financing gap

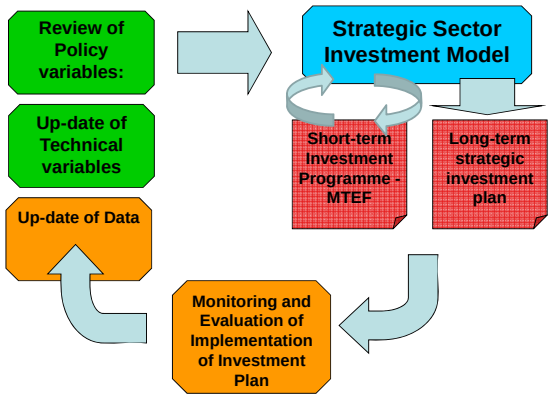
This combination of data, technical and policy variables will provide the basis for a relatively simply and transparent calculation of the investment needs (expenditure forecast), the projected finance availability and thus the financial gap or surplus. Changes in the variables and available finance will allow the finance gap to be managed.

2.3 Concept of strategic planning and links to the MTEF

To ensure continued use of the planning tools that can improve the long-term planning in the water sector, the tools developed for the strategic financial planning are tailored to the planning needs of the sector institutions and towards improving the MTEF budgeting process. This project is focussing on the water and sanitation services and other aspects under MNR such as energy and mining would require other or similar tools to provide a common platform for assessing financing needs.

Figure 3: Updating and using the SFPM in MTEF Process

The process for updating and making use of the strategic financial planning model is shown in Figure 3.

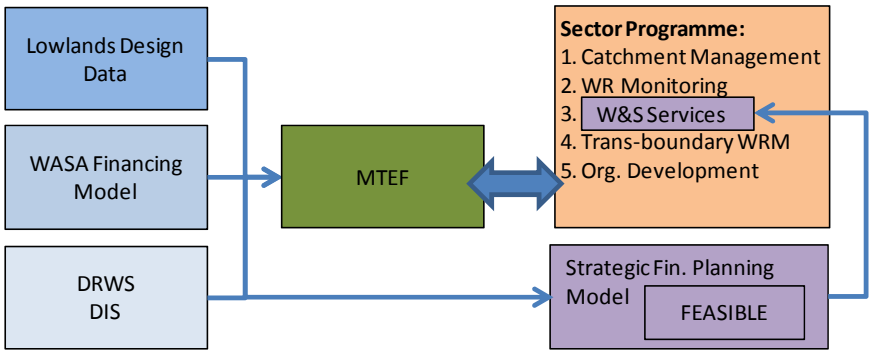


The SFPM presents estimates for the investment needs and financing gap based on inputs of data (on existing water and sanitation systems, population and water demand, and available water and financial resources), technical variables (such as unit costs and design standards) and policy variables (such as targets, tariff policies etc). The SFPM can thus be used to predict the investment needs and determine the effect of changing policy variables such as the coverage targets, tariff and subsidy policies.

The SFPM is a tool for determining the medium- and long-term investment needs to fulfil targets is a tool for analysing the funding needs in the different sub-sectors and allocation between e.g. urban and rural water and between water and sanitation. The SFPM will therefore over subsequent years guide the MTEF process so that budgets gradually will be in line with the requirements for fulfilling the long-term targets.

Figure 4: SFPM in relation to other planning tools

The SFPM estimates can be updated whenever the data foundation changes or if subsequent years implementation for various reasons has not been in accordance with the estimates



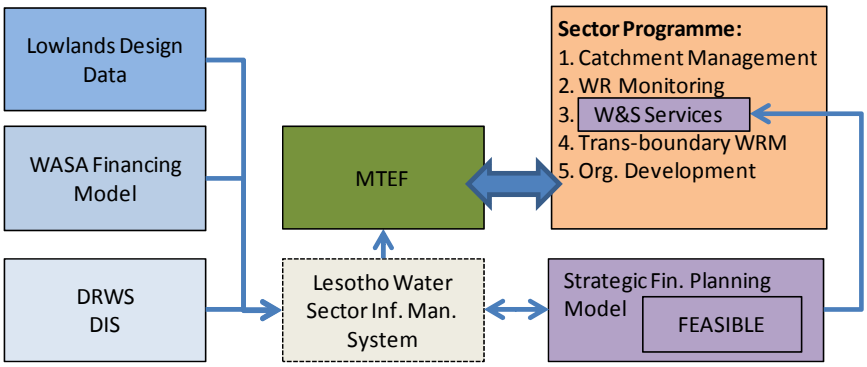
in the SFPM. This could typically happen every 3 years and one would evaluate the implementation of the investment plan and update the data and technical variables and review the policy variables to provide a new set of estimates for investment needs to guide the MTEF process. The MTEF process will therefore remain a bottom-up process where the sector institutions from local level upwards prepare the plans and budgets based on guidance from the SFPM on the overall allocation.

DRWS prepares MTEF budgets and plans using the DIS a detailed information and planning systems based on individual modules for each district that contains the information and plans for each rural community. The SFPM shall not attempt to duplicate or replace the DIS, but utilise the data from the DIS and combine with information from other sources such as the lowlands design.

WASA uses the Financial Model to analyse the income, operating costs and financing needs for the respective systems. The WASA Financial Model focuses on the financial aspects of WASA's business where the SFPM focuses on determining the future demand and estimating the consequences in terms of investment costs and operating profits. The SFPM links to the Financial Model data and combine with the information from the LLWSP on the supply of bulk water, supplementing or replacing the existing water sources and treatment facilities.

The water sector is preparing a Sector Programme covering all activities in the water sector where Water Supply and Sanitation (W&S) is one of 5 aspects. The Sector Programme will be guided by the outputs from the SFPM for the W&S aspects. The relationship between the existing planning and information systems, the SFPM and the Sector Programme is illustrated in Figure 4.

Figure 5: SFPM in relation to LWSIMS



The SFPM will be based on data directly from the DIS, the WASA Financial Model and the LLWSP Design and will provide input to the cost estimates for the water and sanitation services part of the Sector Programme. The COW has designed the 'Lesotho Water Sector Information Management System' (LWSIMS) as a common information system for the water sector. The LWSIMS is a comprehensive system that combines the information from all the sub-sectors in one internet based platform. In the future the SFPM can be linked directly to the LWSIMS as illustrated on Figure 5 however as the LWSIMS is not yet fully populated with data, initially the SFPM will get the data directly from the existing sub-sector systems.

The SFPM provides estimates of the present coverage and the back-lock in terms of coverage and could possibly be further developed to be an integrated part of the LWSIMS to provide easily accessible information on these aspects.

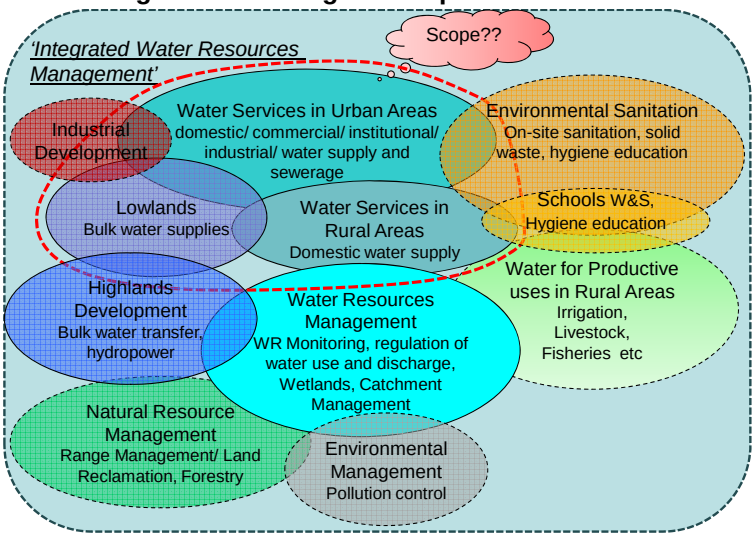
2.4 Scope

Integrated Water Resources Management (IWRM) is a key pillar in the Water Policy (2007) and eventually the strategic financial planning for the water sector should cover all IWRM aspects. The IWRM stakeholders are many and diverse and the plans for implementation of a comprehensive catchment management approach are not yet ready.

Development of strategic financial planning depends on well defined plans and targets and therefore a 2-step approach for the strategic financial planning has been chosen:

– Start with the Water and Sanitation Services (WSS) that are directly influenced by the planning and budgeting in the COW's Office (Water and Sewerage Authority (WASA), Department of Rural Water Supply (DRWS), Lesotho Lowlands Water Supply Unit (LLWSU) and when the methodology and tools developed through this project have proven to work, improve and expand to cover all IWRM stakeholders;
– While the strategic financial planning for WSS is being developed through the current project, prepare the foundation and ensure commitment from stakeholders for developing the expanded IWRM strategic financial planning.

Figure 6: Defining the scope in the IWRM Context



The foundation for later development of the IWRM Strategic financial planning would include:

– Effective mechanism established for coordination between all stakeholders involved in IWRM;
– Agreement on institutional responsibilities for catchment management activities and institutional set-up of Managed Resource Committees/ Catchment Management Committees;
– Data foundation for IWRM established covering irrigation potential, livestock, wetlands, water resources (operationalise the Department of Water Affairs (DWA) – Management Information System (MIS) and institutionalise the RIBASIM[4]), hydropower, water quality/ pollution, environmental sanitation, schools water and sanitation, drought and flood mitigation etc.
– Specific and costed capacity building plan/ programmes developed for Managed Resource Committees/ Catchment Management Committees and agreement established with Local Councils, Chiefs and Ministries of Environment, Agriculture, Land Reclamation and Local Government on implementation responsibilities.

2.5 Planning Tools

Two generic planning tools are available for investment planning in the water sector: the FEASIBLE tool and the SWIFT tool.

Being highly generic planning tools, the FEASIBLE and SWIFT models have some disadvantages:

– The models cover only part of the sector – SWIFT only water services and FEASIBLE does not cover bulk water infrastructure;
– The models have fixed planning periods[5] – it is therefore not possible to set targets for e.g. Millennium Development Goals (MDGs) at 2015 and Government Vision 2020;
– FEASIBLE needs modelling of population and demand forecasts separately;

[4] RIBASIM: water balance model developed as part of the IWRM strategy

[5] There is the possibility to chose between a fixed 10 year or a 20 year planning horizon in the FEASIBLE tool

– The generic models cannot easily be extended to cover the full IWRM scope of the Lesotho water sector.

After considering the possibilities during the Inception Phase is was agreed that the strategic financial planning project will develop a Strategic Financial Planning Model (SFPM) specifically for the Lesotho Water Sector according to the agreed definition/ scope of the assignment and the planning horizons relevant for the sector in Lesotho. The SFPM shall be used to provide the data input to the FEASIBLE Tool on demand forecasts, non-revenue water and cost inputs so that the FEASIBLE tool can be tested as an alternative to the SFPM and the cost estimates for the components covered by FEASIBLE can be compared to the SFPM estimates.

The WSP - Unit Cost Estimating Tool[6] has been updated to cover the Lesotho specific technologies and input costs and provides the cost data for the SFPM.

The SWIFT Tool has been used as inspiration for the design of the SFPM but not used directly in the project due to the following reasons: i) the SWIFT tool is structured according to the Kenyan water sector and needs substantive modifications to be applicable in Lesotho; ii) the tool only cover water services; iii) the tool is not yet fully developed and; iv) WSP has stopped working on the tool and is rather pessimistic about the rationale for completing it as a generic planning tool.

As a purpose build model, the SFPM is designed so that modules can easily be added to cover the full IWRM scope.

The concept of linking the SFPM directly to the sub-sector planning systems reduces the need for separate data collection and the need for developing or customising the comprehensive questionnaires developed by OECD as described in the Terms of Reference. While adhering to the concept of using the existing sub-sector systems, it has been realised that these were not instantly able to produce the quality of data that is needed for good planning purposes e.g. the issues on population data for rural water systems and the lack of data on existing networks and service area mapping to produce population data in the urban areas.

2.6 Data Collection Surveys

The project carried out four separate data collection surveys:

- WASA Connection Survey
- Water and Sanitation in Peri-urban areas not yet served by WASA
- Private Connections in rural water supplies
- Willingness and Ability to Pay (WAP) studies in mountain areas

WASA Connection Survey

The analysis of affordability of water services and determination of future water demands will benefit from more detailed data on the urban connections to clarify how many persons are served with water from different types of connections Information on the type of domestic connections in urban water systems and number of persons served by each connection.

WASA's data only identify if a connection is domestic, industrial, commercial, government or others (covering schools, churches, clubs etc) and the type of domestic connection is important to determine future consumption patterns. The differentiation of the domestic connections into house connection (using indoor plumbing) and yard taps as well as other types e.g. shared by a compound with rented accommodation for several households and the extent of supply to neighbours is important to determine the future demand patters. This information

[6] Cost estimating tool developed by the Water and Sanitation Programme (WSP) in Nairobi in 2003 and used for water sector planning in Kenya and Uganda.

combined with the WASA costumer data base on consumption will provide better data on consumption per person and number of persons served[7].

WASA has a customer information data base that is used by the Marketing Department to keep track of customer information, complaints etc and is the process of improving the information to include other characteristics of the costumers. The design of the questionnaires and the data collection was carried out as a joint effort between the project and the WASA departments for Marketing and for Billing.

Table 2: Results of WASA Connection Survey

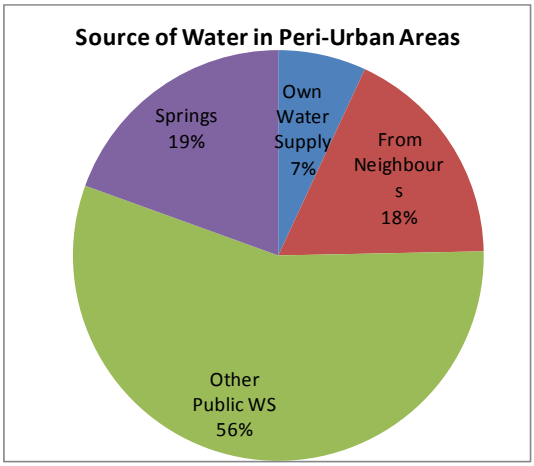
Some results from the WASA survey

- In average 26% of the WASA connections serve rented accommodation with an average of 4.1 households
- 20% of the WASA connections serve neighbours in addition to the owner's household and an average of 2.8 households
- In average 6.5 persons is served per connection
- 52% of connections serve persons through house installations and 48% of connections serve persons through yard taps
- 8% have alternative water supply from Boreholes and 35% collect rainwater to supplement the WASA water supply
- 64% use water storage to mitigate intermittent supply (12% tanks and 88% containers)
- The average per capita consumption is 51 l/p/day. Yard taps 42 l/p/day and house connections 67 l/p/day.

The survey was carried out by distributing questionnaires with the water bills and collecting them at pay points. A draw for a small price was included as an incentive for returning the questionnaires. The response was not very good and in total approximately 1,200 questionnaires were returned and analysed, however this has allowed for determining some of the important planning parameters such as the number of persons served per connection and the extent of supply to neighbours. By linking to the billing data base and analysis of average consumption over the period from April 2008 to March 2009 it has been possible to determine the average consumption per person served by house connections and yard taps respectively. The result of the survey is described in detail in Annex C and a few key findings provided in Table 2.

In view of the importance of this type of planning data and the limited response in returning the questionnaires it could be considered by WASA to implement this type of survey more systematically and in general improve the customer data base to include information on the number of persons served by the respective connections.

Figure 7: Sources of Water in Peri-urban Areas



Water and Sanitation in Peri-urban Areas

This survey was carried out in order to better understand the extent of self supply in peri-urban areas and the willingness to connect to utility water supplies where alternative supplies are in place.

The peri-urban surveys were carried out as sample surveys in selected peri-urban areas. The survey covered a total of 226 households in Maseru (Penapena, Makhoathi, Likotsi, Ha Foso) and in Maputsoe (Mpharane and St Monica).

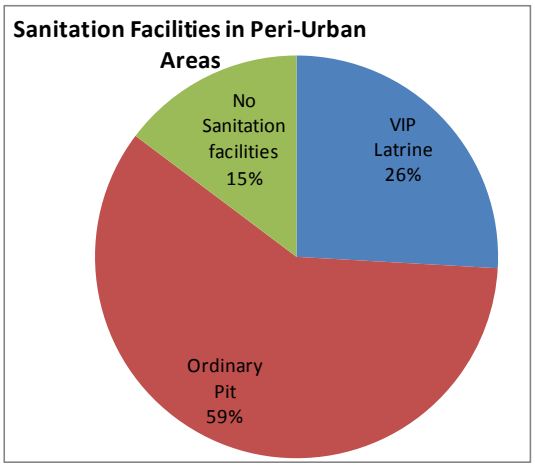
The survey focussed on the water sources used by the households in areas not covered by the WASA network. As illustrated in Figure 7, the survey revealed that the largest proportion (56%) get their water from another public water supply predominantly hand pumps installed by the DRWS. 7% has their own water supply, either boreholes with electrical or hand pumps

[7] Present coverage in urban areas determined by number of domestic connections multiplied by 5 persons per connection.

or rainwater collection systems and 18% gets water from neighbours. 19% collect water from springs.

It is noted that none of the households buys water from water vendors and that only a few collect from WASA standpipes. The distances to the WASA standpipes were more than 1km. The water from springs in peri-urban areas serving almost 1/5 of the households would not be expected to be of good water quality and is likely to be biologically contaminated.

Figure 8: Sanitation in Peri-urban areas



The majority of the households collecting water from neighbours pay for the water at a rate of M1 per 20l bucket. It should be noted that this is equivalent to M50 per m^3 or 15 times the lowest WASA tariff.

94% of the households without their own water supply indicated that they would be willing to connect to WASA should the network be extended to their area while only 75% of the households with own water supply would be interested in connecting.

The sanitation facilities in the peri-urban areas are predominately pit latrines as shown in Figure 8 as there were no flush toilets in the households that were surveyed. It should be noted that 15% of the households in the peri-urban areas do not have sanitation facilities and this must be causing a health risk in the community. 27% of the households without sanitation facilities indicate that they have access to the neighbour's facilities while the rest is using the 'mountain' or 'forest'.

More detailed results from the survey are provided in Annex C.

Private Connections in Rural Water Supplies

The survey was carried out to get a better understanding of the extent of private connections in rural areas and the barriers to more connections in order to predict future connection ratios that will be important in the model as it greatly affects the water consumption and cost of systems.

The survey covered a total of 212 households and was carried out in Mohales Hoek (Ha Sechele); Maseru (Motloheloa, Masana, Matsieng, Masianokeng) and Leribe (Tsikoane/ Matukeng).

The survey focussed on the opinions from different stakeholders from DRWS at national level; RWS staff in the districts to the local governments at Community Council level and from the community leadership involved in the management of the water systems.

The opinions on why not more households are getting private connections in rural water systems vary from the national level to local government level and to the users. The cost of the installation and lack of money is the main reason with 32% of the responses. It is noticeable that at the community level, the lack of money was the reason in almost 50% of the responses while at the national level this was only the opinion in 25% of the responses. At the national level the opinion is that lack of information dissemination and knowledge of the users of the possibilities of private connection and the water sector strategies and roles and responsibilities is a major contributing factor, as indicated in about 40% of the responses. This seems to be less of a problem at the local government and community level where the respondents seem to think that the information dissemination has been adequate.

In general the households perceive the main obstacle to be poverty and lack of money for paying for the connection as in average this is mentioned by 50% of the households. In addition there seems to be some more scheme specific obstacles such as a perception that the water system is not designed for private connections.

The households were also asked what could be done to improve the water supply situation in the community. The overwhelming response was that government should subsidise private connections. In four of the five communities a number of households advocated for that the government should support households in getting rainwater harvesting tanks/ systems. This has been on the agenda of DRWS for the last few years but has never been operationalised.

The households with private connections were asked what their main motivation for getting a private connection was. The obvious answer was in more that 50% of the households, the wish of bringing the water near to the household and avoid long distances and waiting time for getting water. Interestingly also the pressure from the water committee to make connections was dominating especially in Masianokeng where the system was designed to only cater for private connections. The use of water for productive uses was mentioned by a big group especially in Matsieng where about 40% use the water for livestock or gardening. This will need to be taken into account in the DRWS design standards for the volume of water allowed per person.

The survey also covered other aspects concerning the level and reliability of service, cost of connections and willingness to pay for O&M costs as well as sanitation. Only 20% of the households with private connections use the connection for water installations inside the house while most only install a yard tap. This would affect the DRWS design standards on average per capita consumption. The results on the reliability of water supply indicate that the water systems are not operating continuously indicating that 60 – 80% of the households have alternative ways of storing water since the systems do not operate 24 hours.

An interesting observation on the sanitation data is that for both the households with connections and the households without water connections it is common to share the sanitation facilities with neighbours as more than 70% of the sanitation facilities are shared. In no instances do the neighbours pay for the use of the sanitation facilities.

More detailed results from the rural surveys are included in Annex D.

Willingness and Ability to Pay (WAP) studies in mountain areas

The LLWSP has made substantial affordability analysis and willingness to pay studies in the lowland areas covered by the lowlands schemes in both urban and rural areas and results are also available from WASA costumer surveys, the 2004 tariff study for WASA and the studies done by DRWS as part of the development of the After Care Strategy in 2004-05 and recent major rural schemes. This project has therefore only carried out a limited study in the mountain areas covering urban areas and rural areas in Thaba Tseka and Qacha's Nek Districts respectively.

In the urban areas the locations surveyed are inside the WASA supply areas but not covered by the present distribution network. The rural areas in Thaba Tseka District are locations where there are inadequate old water systems (partly functioning diesel systems or hand pumps) and new water systems are planned and designed). The locations in Qacha's Nek District have existing gravity water systems.

Some of the questions were on identifying the main water related problems. The response is overwhelmingly in both rural and urban areas (approx 75%) that the water problems are related to the distance and time it takes to collect water and the available quantity of water. This is interestingly also the case in the rural villages in Qacha's Nek where there are existing systems. Here it is obvious that the present level of service from public standpipes is not considered adequate. Water quality is a problem (approx 15%) for some of the areas where people resort to unprotected springs.

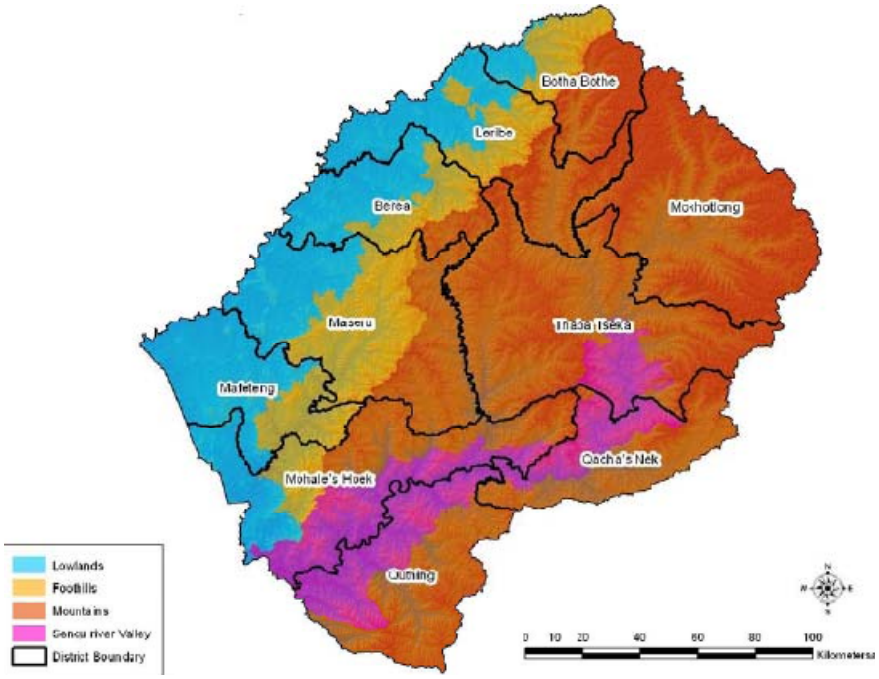
The cost of water seems to be a minor concern in all cases. System breakdown is more a problem in the rural than in the urban areas. The willingness to pay questions were addressed in two manners: i) amount willing to pay for connection and ii) amount willing to pay or work willing to do for regular monthly cost of maintaining and operating water systems. The results are discussed more in detail in Chapter 5 and Annex E.

3 THE WSS SECTOR IN LESOTHO

Geography and Water Resources

Lesotho has a land area of 30,344 square kilometres bordered by the Drakensberg escarpment on the eastern and northern side and the Mohokare/ Caledon River on the western side. The elevations are between 1,400 to 3,484 metres above sea level.

Figure 9: Ecological Zones in Lesotho



The country is divided into four ecological zones as shown on Figure 9[8]. The Lowlands form a narrow strip along the western border with South Africa at approximately 1,500 to 1,800m above sea level. The lowlands have over 80% of the productive arable land and the highest population densities. The Foothills range in elevation from 1,800 to 2,000 metres above sea level along the western side of the Maluti mountain range. The foothills cover 8% of the country and also support high population densities. The Senqu River Valley (SRV) is a major grassland area marked by shallow soils. The Mountain region ranges from 2,000 to 3,400 metres above sea level and is less densely populated.

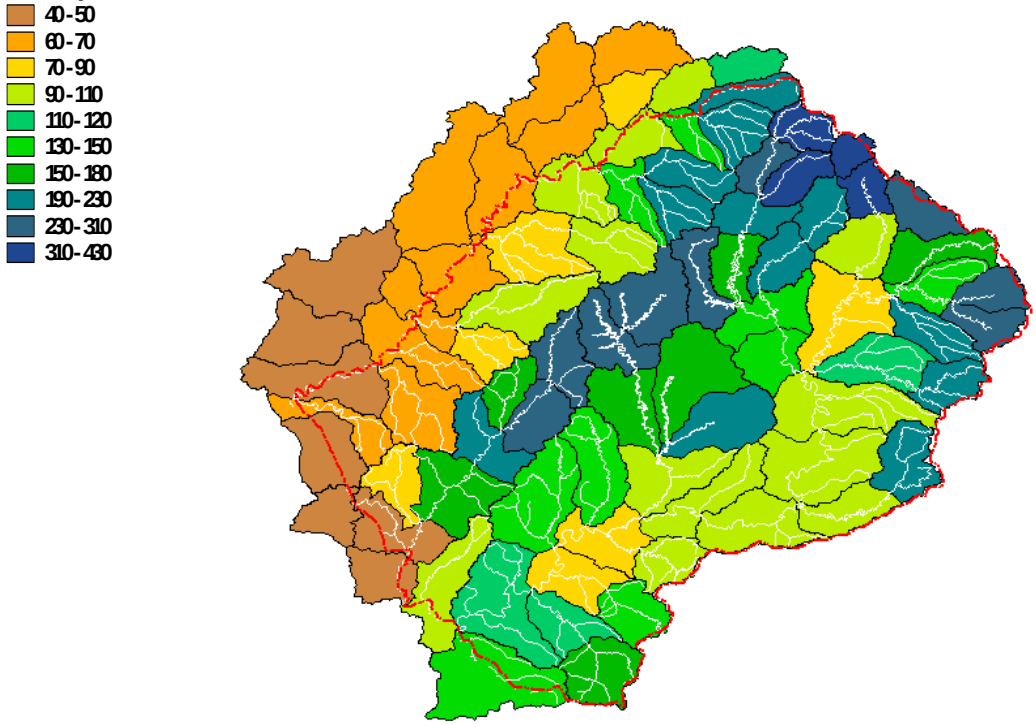
The climate of Lesotho is characterised by warm moist summers, from November to March; and cold dry winters from May to July. The climate can thus be categorised as semi- to sub-humid and continental. The southern lowlands and SRV are warmer and drier than the northern lowlands and mountains. Higher elevations above 3,000 metres above sea level receive enough snow during winter to cover the ground for several months with sub-freezing temperatures. However, the country exhibits marked seasonality with even the lowlands experiencing winter frosts. Precipitation ranges from 450 mm in the south-western lowlands to 1,600 mm in the northern lowlands and eastern highlands. The mean annual temperature ranges from 5.7 ^{0}C at the higher elevations to more than16^{0}C in the southern lowlands.

The availability of water resources vary almost 10-fold across Lesotho as illustrated on Figure 10[9] with the northern highlands having run-off of above 300 mm per annum and the south-eastern lowlands having run-off of less than 50 mm per annum.

[8] Figure 9: Ecological Zones in Lesotho is from the BOS Statistical Yearbook 2008

[9] Figure 10: Annual run-off in mm in sub-catchments of the Mohokare and Senqu basins is from the draft IWRM Strategy, MNR, 2007

Figure 10: Annual run-off in mm in sub-catchments of the Mohokare and Senqu basins



Implications for Strategic Financial Planning: the natural resource conditions as a water rich country favours Lesotho however the uneven distribution of water resources as shown on Figure 10 implies that in the long-term water transfers will be needed from the water rich mountain areas in the north/ middle of the country to the very dry and heavily populated low-land areas in the southwest.

3.1 Policy/ Institutional Dimensions

3.1.1 Policy and Strategic Aspects

National Vision

The overall development strategies in Lesotho are guided by the Vision 2020. The Vision 2020 statement reads*: 'By the year 2020 Lesotho shall be a stable democracy, a united and prosperous nation at peace with itself and its neighbours. It shall have a healthy and well-developed human resource base. Its economy will be strong; its environment well managed and its technology well established'.*

The components of the Vision Statement have been clustered as follows:

- Stable democracy = (governance, media, gender)
- United nation = (culture)
- Nation at peace with itself and its neighbours = (peace)
- Healthy and well developed human resource base = (health, HIV and AIDS, education, sports)
- Strong economy and prosperous nation = (economy, prosperity)
- Well managed environment = (environment)
- Well established technology = (information, communication, science, technology)

Good governance, media freedom and gender sensitivity should characterize Lesotho as a **stable democracy**. The development management capacity is another aspect of governance. For this, Lesotho has embarked on the Public Sector Improvement and Reform Programme (PSIRP). The programme represents the Government's framework for public sector improvement and reform. The key challenges in development management capacity include: improving research capacity, coordinating information management systems, dealing with brain drain in different sectors, implementing the PSIRP and strengthening the public-private and civil society partnership in development.

Local governance and popular participation contribute towards good governance. To this end the country is working towards decentralisation by implementing the Local Government Act of 1997. The challenge is to empower the imminent local government authorities, and to improve chieftainship as a strategy to complement local governance at the grassroots level. Freedom and pluralism of the Media are some of the measures of stability and democracy.

With regard to gender, Lesotho's female population enjoys higher education attainment and literacy than the male population. This enables upward mobility for them in various sectors of the economy. The key challenge is to uproot discrimination as a way of life and appoint more women into areas of responsibility in both the public and private sectors without neglecting boys and men.

Lesotho is envisaged to be a **united nation** by 2020. The role of the Monarchy is to unify the nation. The widespread use of national symbols such as the national flag signifies a united nation sharing common goals based on a common cultural heritage. The greatest challenge is to inculcate the spirit of patriotism in all Basotho. Other challenges include protection of Lesotho's culture and its heritage.

Lesotho is a nation at **peace** with itself and its neighbours. Evidence of internal peacefulness of Lesotho lies in: the known peace-loving nature of Basotho, the fact that Basotho are a nation with Sesotho as the main language and a shared history, culture and traditions. Lesotho is also at peace with her SADC and African neighbours. However, the country still faces the challenge to promote political tolerance, and combat the current rate of internal and cross-border stock theft, crime and armed robberies all of which deprive communities of the necessary state of peace.

The Government's efforts to address good **health, the HIV and AIDS pandemic and education** are indicative of a commitment to the attainment of a healthy and well developed human resource base by 2020. With regard to health, Lesotho has made remarkable progress in pro-

viding access to social infrastructure, including access to safe drinking water. Challenges include equitable distribution of health facilities and strengthening the health institutions for efficient and effective service delivery. The Government of Lesotho recognises that HIV and AIDS is not only a health problem but a multi-sectoral development issue that has social, economic and cultural implications. Combating further spread of HIV and AIDS therefore continues to be one of the biggest challenges that face the country.

Education is central to national development. Presently Lesotho's adult literacy rate (82%, 2002) is higher than in most African countries. The country is committed to provision of an equitable basic education to all Basotho as a key development goal. Key challenges include: further improving access to education at all levels, and developing a curriculum that responds to the national development priorities, thus promoting entrepreneurial life, and technical and vocational skills.

With regard to sports Lesotho will be a leading sporting country. The challenges facing the country include building facilities country wide and strengthening Basotho youth's capabilities in sports.

Lesotho has a potential to be a strong and prosperous nation in **macro-economic performance** terms. Its Macro-economic policy has been largely conducive to strong economic growth. Since the 1970s, the economy has been transformed from one dominated by agriculture to one dominated recently by manufacturing. While this has improved livelihood options in the urban sector, it has significantly undermined the capacity of the rural and agricultural sector as a source of livelihood, employment and income. The shifting balance towards manufacturing has also worsened poverty in rural communities, particularly those that depend on food production. It will therefore be necessary to take measures to restore the sources of livelihoods for the rural population.

Notwithstanding higher-than-average growth over many years, the challenge at the macroeconomic level is to sustain strong investment levels, driven by high domestic saving rates as well as access to international credit markets. This will call for prudent economic and financial sector policies, firstly to promote domestic resource mobilisation and secondly, to retain access to international financial markets. Employment creation and prosperity are of national importance within the macroeconomic performance in Lesotho. Challenges facing Lesotho include the need to address the depth and severity of poverty.

Lesotho aspires to have a well-managed **environment** by 2020. The country has signed and ratified several Multilateral Environmental Agreements. The spectacular scenery of the Lesotho highlands, the country's unique ecosystem, biodiversity and heritage offer a great potential for the country's tourism opportunities.

Lesotho is however faced with the challenges of implementing the ratified conventions and treaties for sustainable development, strengthening institutions responsible for natural resources management, development and effective implementation of land management systems. A further challenge is to strengthen environmental management, advocacy and awareness among Basotho.

In pursuance of its goal to make Lesotho a country with a well-established **technology**, the Government has, among other things, adopted a privatisation policy to liberalise the telecommunications sector. In this regard, Lesotho is faced with the challenges to move towards a technology competent country through, among others, increased budget allocation towards science and technology development, forging partnerships with other countries, strengthening science and technology education, as well as promoting science and technology research, innovation and development.

The Vision document identifies and prioritises strengths, weaknesses, opportunities and threats that should inform strategic choices in Lesotho.

The major strengths of the country include the Government's commitment to development, widely accepted and respected constitution, cultural homogeneity, the electoral system and high adult literacy.

Major weaknesses on the other hand include food insecurity, high rate of unemployment, poor strategic and operational planning, inadequate research in science and technology, and an underdeveloped SMME sector. In the external environment the major opportunities are foreign direct investment and good relations with the Republic of South Africa, while the major threats include brain drain, donor conditionalities, decline in mine labour remittances and the increasing competition from international markets.

There is a wide gap between the present situation and the desired vision. For Lesotho to realise its vision there are three major challenges namely: improvement of the development management capacity; sustenance of the investment currently characterising Lesotho's economy; and sustenance of political commitment and support to the Vision up to the year 2020.

Water Sector Policies

The policy dialogue in the water sector in Lesotho has been vibrant over the last couple of years and has resulted in firm outputs. The new 'Lesotho Water and Sanitation Policy' was approved in February 2007 and the new Water Act, 2008 was gazetted in December 2008.

The guiding principles of the Lesotho Water and Sanitation Policy are:

A. Fresh water is a finite and vulnerable resource, essential to sustain life, development and the environment. Its utilization must therefore be sustainable;
B. Since water sustains life, in order to be effective, the management of water resources demands a holistic approach, linking social and economic development with the protection of natural ecosystems. Effective management of water resources would also link land and water uses across the whole of a catchment area as well as the groundwater aquifer in an integrated management framework;
C. Water has both social and economic value and should be recognized as an economic good. Managing water as an economic good is an important way of balancing its competing uses and achieving its equitable, efficient and sustainable utilization while encouraging its conservation and protection;
D. Water management and development should be based on a participatory approach, involving users, planners and policy-makers. A participatory approach involves raising awareness on the importance of water among policy-makers and the general public. A participatory management approach also requires that, decisions be taken at the lowest appropriate level of governance, with full public consultation and the involvement of users in the planning and implementation of water and sanitation programmes and projects;
E. Women and girls continue to play a central role in the provision, management and safeguarding of potable water. The pivotal role of women as providers and users of water and as guardians of the living environment requires appropriate legislation and strategies to empower them to participate at different levels of decision-making in water resources management and development and to share in the benefits of water utilization on the basis of equity;
F. All Basotho are entitled to have access to a sustainable supply of potable water and to the provision of basic sanitation services at an affordable cost;
G. Public-Private Partnerships are essential for sustainable development of water resources and accelerated access to potable water and sanitation services to the unserved and underserved population on account of improved efficiency of operations and investments; and
H. Each riparian state within a shared watercourse has a right to reasonable and equitable utilization of water within its boundaries. This right may be exercised through an integrated basin management approach and the active participation in planning and implementation of joint programmes aimed at conserving and sustainably utilizing river basin systems.

These policy principles will guide the development of the financing strategy and the development options. In particular the recognition of the dual social and economic role of water

will influence the strategic choices for water services and the discussions on the financing strategy will need to look at options for how the policy of providing free basic water to households, that cannot afford to pay the tariffs, can be operationalised.

IWRM is a key aspect of the water policy and an IWRM Strategy was developed in 2007 by the office of the COW. The Strategy emphasise 5 guiding standard strategies against which the detailed strategies are prioritised as shown in Table 3.

Table 3: IWRM Standard Strategies

Strategy	Goal	Success Criterion	Examples of possible implications on financing strategy
1. Social Equity Strategy	Equal distribution of water resources goods and services	Degree of equal access to safe water and sanitation services	More funding to CCs with low existing coverage – reduced funding to CCs with coverage above target
2. Maximum Reliability of Supply Strategy	Reliability of service delivery to the majority of the population	Degree of water delivery efficiency	Emphasis on capacity building to improve management of rural water systems and investments in replacement of old equipment and pipes in urban systems
3. Minimum Government Investment Strategy	Minimize necessary investment in measures by GoL	Amount of Government monetary investment	Willingness to increase tariffs to work towards the (urban) sector being self-sustaining
4. Minimum Environmental Impact Strategy	Implement the measures that impact least on the environment	Amount of impact on the state and health of ecosystems	Aim at using water sources that supply water by gravity and avoiding systems with high energy and chemical use. Investment in proper environmental management plans. Investment in wastewater treatment for industries in Maseru
5. Rapid Result Strategy	Implement the rapid and short term measures that give results fast	Implementation time times anticipate success	Focus on connecting more households to existing reticulation systems e.g. by making it easier for poor households to afford the connection fees

The only detailed rural water and sanitation strategy document that describes the implementation policies and roles and responsibilities of stakeholders is the 'After Care Strategy' that was approved by Government in 2007. The 'After Care Strategy' is critical for the sustainability of rural water and sanitation investments. The policy principles are outlined in the box below:

The After Care Policy Principles

The management of rural water systems shall be guided by the following policy principles:

- CCs as the lowest level of Local Government are the owners of the water systems and responsible for planning and implementation of new water systems and monitoring and supervising the management of existing rural water systems.
- VWHCs, legally established under the CCs are responsible for management, operation and maintenance of their water systems.
- The private sector will be contracted by the VWHC where necessary to provide maintenance and operational services.
- Water users will pay for water services according to tariffs for individual water systems based on operation and maintenance plans and sound business principles for the management of the water systems.
- Central Government will play a facilitating role and will not be directly involved in operation and maintenance of the water systems.
- DRWS will provide support and capacity building to the new local governments to operate effectively in the sector and support VWHCs.

- VWHCs can apply for subsidy for major repairs, rehabilitation and extension of systems. The subsidy will be for a maximum of 90% of the cost and the remaining will be contributed by the VWHCs either in kind as participation in the works or as cash contribution to project costs.
- To achieve maximum impact on poverty alleviation, health benefits and achievement of the Millennium Development Goals, the support to community management of water supplies shall be coordinated with the promotion of sanitation and hygiene education, and shall include capacity building of the users and community organizations in management, operation and maintenance of the water and sanitation facilities as well as covering environmental issues.
- Gender equity and social issues including HIV/AIDS prevention shall be considered and fully taken into account in the capacity building activities as well as the development and management of facilities.

The strategy for implementation of **rural sanitation** was developed in 1983 and is based on full payment by owners for sanitation facilities and government provision of capacity building and health and hygiene promotion. To reach the poorer segments of the communities, DRWS in cooperation with the rural sanitation program under Ministry of Health has over the last 5 years been promoting household sanitation with a subsidy as an integrated part of water supply projects. The strategy of providing a subsidy for latrines has however not been costed.

Implications for Strategic Financial Planning: The principles from the Water Policy will provide overall guidance for the development options for Strategic Financial Planning and the five standard strategies from the IWRM Strategy can also guide the development of the financing strategy and the development options. Some examples of how these priorities could affect the financing strategy are provided in the right column in Table 3.

The implementation of the policy of free basic water for vulnerable households would have implications for the financing of the sector. There seems to be two main possibilities for households within the existing service areas: i) funding by Government through taxes to the water service provider or as social grants to the households; or ii) cross-subsidy from larger water users to the low-income water users. The fact that the un-served poor households often pay more for inadequate and low quality water services must also be taken into account.

The planning tools developed as part of the strategic financial planning project can be used to estimate the cost of implementing full scale the DRWS subsidy to sanitation for rural households.

3.1.2 Legal Framework

The legal framework of importance for provision of water and sanitation services includes the following:

- The Water Act (2008) with the overall purpose to manage water resources in an integrated and sustainable manner. It makes provisions for conservation and protection of the water resources from all forms of pollution. It provides for the ownership of all water resources to be vested in the Basotho nation and held in trust by the King. It makes provision for different types of permits, such as abstraction permits and construction permits and the manner of acquiring them. It establishes the office of the COW to be responsible for the formulation of the Water and Sanitation Strategy, determination of a reserve and classification of water resources for the management and utilisation of water resources in the country.
- The WASA Order of 1991 providing the directions and regulations for WASA. It describes the mandate of the authority, the functions of the Board of Directors and the officers, its financial provisions (including tariff settings), general functions and powers, works and areas of jurisdiction of the Authority. The institutional status of WASA is under

revision and a 'Lesotho Electricity and Water Authority Bill' has approved by the Cabinet during 2008 however the Parliament Portfolio Committee has required some revisions to allow for WASA to become a company. MNR has therefore also prepared the 'WASA Vesting Bill' and the two have now been presented to the Portfolio Committee.

- The Lesotho Environment Act, 2001 (Act 15 of 2001) is the framework for implementing the National Environment Policy. The principles include: i) ensuring that every person living in Lesotho has a fundamental right to a clean and healthy environment; ii) establishing adequate environmental standards; iii) polluter pays principle; and iv) promotion of national, regional and international cooperation for the protection of the environment. Although the act was published in 2001, it has not yet been formally implemented. When it is implemented it will have implications for the water sector and especially for management of wastewater from the industries.
- The Local Government Act of 1997 and Local Government (Amendment) Act, 2004 establishes local councils at district and community level and define their functions. The plan for decentralization from central Government to Local Authorities for the period 2004 – 2009 (GoL 2004) provides a further break down of the decentralised functions. Of relevance for water and sanitation services are:
  - The establishment, operation, management and regulation of a potable water supply system (Municipal councils)
  - Water supply through ground water (Community Councils): i) Identification of springs; ii) Erecting protective structures around wells and springs; iii) Laying down pipeline network; iv) Maintenance of the water supply system; v) Issuing of permits and licences for construction of small earth dams and vi) Promoting better management of water resources – monitoring of water quality
  - Local Environmental Health Programmes for i) Water and Sanitation and ii) Pollution control and management
- A Lesotho national standard for potable water has not yet been established, however a draft 'Proposed Water Quality Guidelines for Lesotho – Domestic (Drinking) Water Guidelines dated April 1998 is available from the National Environmental Secretariat.

Implications for Strategic Financial Planning: It appears there is a need to analyse the local government functions as compared to the water sector institutions and agree on a common approach for rational institutional development of the sector. The local government roles as outlined above would imply considerable investment in capacity development of CCs to be able to handle the allocated technical aspects of water services.

International Legal Instruments

- The Treaty of the Lesotho Highlands Water Project (1986) between South Africa and Lesotho has the purpose to eventually deliver up to 70 m3/sec from the headwaters of Orange/Senqu to the Vaal River System in South Africa via dams and tunnels, while at the same time generating hydro-electric power for Lesotho. The Treaty provides the projects to be built in 5 or more phases, by which Phase I is now completed and feasibility study and agreement has been completed for Phase II.
- Other regional treaties for water resources management in Lesotho include the SADC Revised Protocol on Shared Water Courses (2000) and the ORASECOM agreement (2000) guiding the management of the shared Orange-Senqu river basin.
- The development of the water sector in Lesotho is also guided by the SADC Regional Water Policy (2006) and the SADC Regional Water Strategy (2007). Adhering to the guidance from these documents should ensure that the water sector in the respective SADC countries develops in a compatible manner.

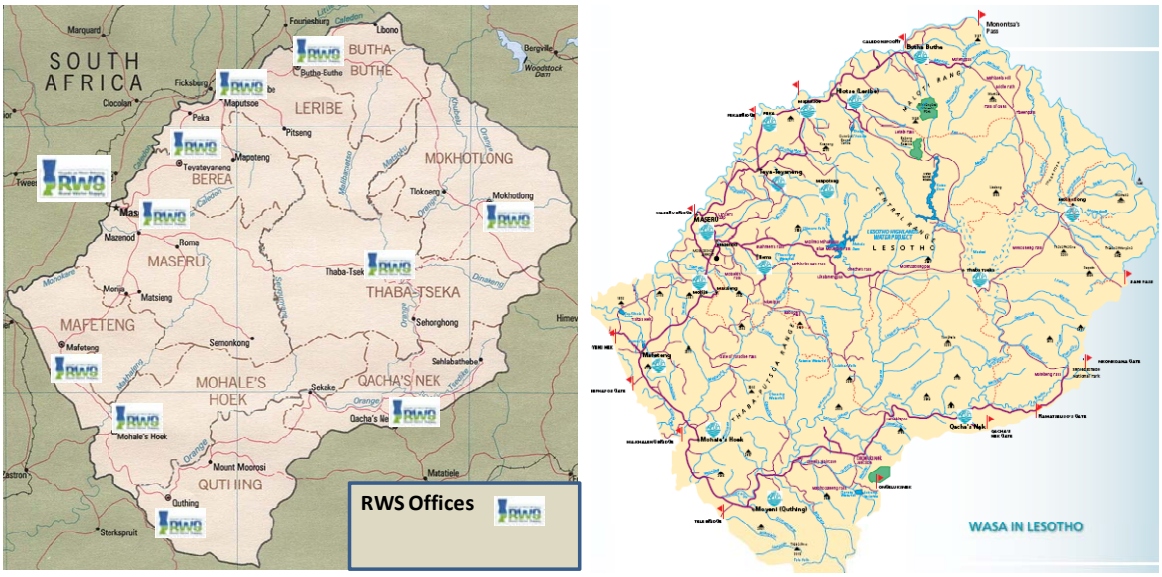
Implications for Strategic Financial Planning: in the longer-term planning horizon when the demand in the lowlands might exceed the available water resources, options of supplying the lowlands from the water resources in the highlands might be considered and this would have implications for the highlands treaty.

3.1.3 Water Sector Institutional Framework

The main institutional responsibilities for water and sanitation services in Lesotho are:

- Water and Sewerage Authority (WASA) responsible for water supply and sewerage services including services for emptying of septic tanks and pit latrines in the gazetted urban areas. Through projects e.g. Maseru Sanitation also involved in supporting the implementation of on-site sanitation facilities such as VIP Latrines. WASA is present in all the districts of Lesotho as shown on Figure 11
- Department of Rural Water Supply (DRWS) is responsible for overseeing water and sanitation services in rural areas that are provided through community managed water schemes and support to on-site sanitation. An ongoing decentralisation process will lead to District Councils and Community Councils being responsible for supporting the communities and implementing new water and sanitation facilities. The location of the DRWS district offices is shown on Figure 11;
- Lesotho Lowlands Water Supply Unit (LLWSU) for bulk supply of water to the densely populated areas in the lowlands of Lesotho has been designed and the implementation of the Zone 4 and 5 is ongoing covering Metolong dam, water treatment and transmission to Maseru and nearby centres. The Metolong Authority has been established to oversee the implementation;
- The Lesotho Highlands Development Authority (LHDA) is responsible for the operation and further development of bulk water transfer schemes from the highlands of Lesotho to the Republic of South Africa. The role of LHDA in water services in Lesotho is limited to implementation of rural water and sanitation projects in the catchment areas for the bulk water reservoirs and release of water to lowland rivers in periods of drought to alleviate water shortages in the urban water systems in particular Maseru.
- The Rural Sanitation Programme and the Health Education Unit under the Public Health in the Ministry of Health and Social Welfare has an important role in supporting hygiene education and promotion of sanitation in urban and rural areas.
- The roles of the local authorities in water services is evolving as outlined in 0 above.

Figure 11: Locations of DRWS and WASA in Lesotho



The Institutional, Financial and Economic Analysis as part of the final design of the LLWSP for the long-term ownership, operation and maintenance of assets developed under the LLWSP recommend the creation of an Asset Management Agency. The Assets Management Agency would be responsible for ownership of the infrastructure and oversight of management and maintenance, as well as for future financing for large water supply infrastructure. The study recommends that WASA assume responsibility for operation and maintenance of bulk water supply infrastructure.

Planning and coordination in the water sector takes place through quarterly coordination meetings chaired by the Permanent Secretary of MNR with the sector stakeholders and donors. A process for gradually arriving at a sector wide approach to planning is ongoing and a Sector Programme is being prepared by the COW's office to facilitate the process and prepare for budget support for the water sector, initially by the EU. The major donors to the sector include:

- EU (Lowlands design, Maseru sewerage, 3-towns water and sanitation, planning for sector programme support);
- WB (supporting the policy process and WASA through the Water Sector Improvement Project and planning to support part of Metolong project);
- Irish Aid (capacity building in the sector and over 20 years support to rural water and sanitation);
- BADEA (Maseru reticulation);
- MCC (rural water and sanitation; WASA and part of Metolong project).

Implications for Strategic Financial Planning: presently there is some overlap between the service areas of WASA and DRWS and a clear delineation would be important for rational planning of water services.

A costed plan for capacitating the local Authorities in their role in water and sanitation services is vital for rational development of the sector and the funding flows.

The management arrangements for the lowlands bulk water schemes and especially tariff setting and the arrangements for connecting and management in the larger rural settlements will have implications for the financing of the sector.

3.2 Socio-economic Dimensions

Lesotho's major natural resource is water, often referred to as 'white gold' by the Basotho people. Completion of the first phase of the Lesotho Highlands Water Project in the mid 1990s generates royalties for Lesotho from the sale of water to South Africa and generates hydro-power to cover the major part of electricity needs in the country.

The economy of Lesotho is based on subsistence farming and animal husbandry, as well as industries that include clothing, footwear, textiles, food processing and construction. The great majority of households gain their livelihoods from subsistence farming and migrant labour, with a large portion of the adult male workforce employed in South African mines. The manufacturing industries and diamond mining sectors have been growing during the last decade.

3.2.1 Trends in the Macro-economic environment

Some of the features of economic development up to 2007 that are important for the analysis of the possible trend in future economic development[10] are:

- In real terms, Gross Domestic Product (GDP) has grown by 4.4% per annum since 2002, with provisional national accounts data showing growth of 2.9% in 2008.
- Manufacturing was the 'leading' economic sector until 2003. There was substantial foreign direct investment after 1999 as businesses exploited competitive opportunities arising from (i) the African Growth and Opportunities Act, which allows textile exports to enter the USA free of duties and quotas; and (ii) the 40-50% depreciation of a Loti against major currencies between 1997 and 2002.
- Manufacturing experienced a slow-down in 2004 and 2005 as producers were hit by the appreciation of the currency and the ending of the Agreement on Textiles and Clothing with effect from 1st January 2005 but showed a strong recovery in 2006 and 2007. Textiles and clothing is however expected to slow down further in 2008 due to new challenges it faces and already did not perform well for the better part of 2008.
- Mining became the 'leading' sector from 2004 onwards, with the opening of two diamond mines. This enabled the primary sector to grow by 10.1% in 2004, -1.6% in 2005, 29.1% in 2006 and 4.1% in 2007. It must be noted that these considerably high growth rates were realised even though agriculture was declining.
- Together with the recovery of manufacturing in 2006 and 2007, mining growth has enabled some other industries, principally service activities, to improve their performance.
- The appreciation of the rand since late-2002 has improved the terms of trade (meaning that Lesotho had to sell fewer exports to buy the same quantity of imports), but deteriorated in 2005, recovered in 2006 and further lost ground in 2007. This coupled with the fluctuations in primary income from abroad due to laying off of Lesotho miners to South Africa led to an average growth of 2.4% from 2002 to 2007. After recording consistent fiscal deficits until 2002/03, buoyant revenues (resulting from an increase in Customs receipts, the introduction of VAT at a standard rate of 14% and strong income tax collections) resulted in a surplus of 7.3% of GDP in 2004/05. Despite expenditure growth of 13.3% in 2005/06, a surplus of 4.1% was achieved while, in 2006/07, expenditure grew by 17.6% but an exceptional payment of Customs arrears at the end of the financial year contributed to a surplus of 14.1%. Fiscal year 2007/2008 also continued to register a surplus of 11.0% of GDP despite continued increases in expenditure by 13.8%.
- The appreciation of the currency and the policy of retiring expensive commercial debt have resulted in substantial falls in the value of public debt outstanding and all debt sustainability indicators are within internationally recognised parameters. The highly concessional nature of external debt means that annual debt service remains manageable.

[10] Information on the economic development in Lesotho is in accordance with the 'Background to the Budget 2009/10' as prepared by the Ministry of Finance

As the first step in merging the MTFF with the Financial Programming Framework under the Development and Implementation of Macro Model of Lesotho (DIMMOL) this model has been used in consensus with the Central Bank of Lesotho to prepare a comprehensive and internally consistent forecast of key economic indicators for the calendar years 2008 – 2012 based on (i) historical trends in the real economy and in aggregate demand; (ii) provisional indicators for performance in 2008; extensive meetings and interviews with relevant sectors; and (iii) assumptions about key exogenous variables, such as the exchange rate and interest rates.

The main assumptions and results are summarised in Table 4. The forecasts show the likely movement of key economic indicators given current circumstances. These projections are based on expected movements in prices and developments in: i) production as recorded in the national accounts; ii) the external accounts; iii) monetary aggregates; and iv) public finances (using the provisional 2008/09 outturn and the fiscal framework prepared for Budget 2009/10).

It must be emphasised that this is a forecast trend of overall economic performance, not a target of desired outcomes. There will be variations around this trend as a result of changes in factors such as weather and commodity prices.

Table 4: Economic Forecast 2006-2012

	2006	2007	2008	2009	2010	2011	2012
Nominal GDP (M Million)	10,269.3	11,777.8	13,979.0	15,022.1	17,005.2	19,025.2	21,687.6
Nominal GDP (annual change)	17.36%	14.69%	18.69%	7.46%	13.20%	11.88%	13.99%
GDP deflator	8.6%	9.2%	15.2%	4.0%	8.7%	6.5%	6.7%
Real GDP (annual growth)	8.1%	5.1%	3.1%	3.4%	4.2%	5.0%	6.9%
Primary	29.1%	4.1%	9.9%	5.6%	2.0%	4.4%	19.2%
Secondary	5.6%	8.5%	-2.5%	1.7%	4.9%	6.4%	6.7%
Tertiary	6.7%	3.4%	3.1%	3.5%	4.2%	4.5%	4.5%
Nominal GNI (M million)	13,098.7	15,127.6	17,437.9	18,541.3	20,562.7	22,762.1	25,014.5
Nominal GNI (annual change)	19.7%	15.5%	15.3%	6.3%	10.9%	10.7%	9.9%
GNI Deflator	6.9%	12.1%	9.6%	5.7%	4.8%	5.7%	6.4%
Real GNI (annual growth)	12.0%	3.0%	5.1%	0.6%	5.8%	4.7%	3.3%
Exchange rate (1US $:M)	6.780	6.630	8.260	9.350	10.100	10.423	10.715
Interest rate (91 day bills)	6.8%	7.8%	8.5%	8.1%	7.7%	7.2%	6.8%

Real growth in GDP at purchasers' prices recorded 5.1% growth in 2007, slowed to 3.1% in 2008 and is expected to register a 3.3% growth in 2009. The 2008 growth is the aggregate outcome of an increase of 9.9% in primary industries (the poor harvest is expected to be offset by continued growth in the mining sector), a reduction of 2.4% in secondary industries and a further increase of 3.1% in tertiary industries.

For subsequent years, the forecast indicates that there will be moderate annual growth with real GDP increasing by 3.3% in 2009 improve to 4.2% in 2010 and accelerating by 5.0% and 6.9% in 2011 and 2012 respectively.

Over the five years 2008 - 2012, the annual average growth rate will be 4.8%. Since this rate of growth significantly exceeds the rate of population growth derived from the provisional 2006 Census data, it signals improvement in GDP per capita and it may be assumed that Lesotho will achieve a sustained reduction in the incidence of poverty.

However, much of this economic growth will be generated by mining, which is a predominantly foreign-owned enclave industry, and the wider economic benefits are likely to be quite limited. Thus, Lesotho needs to explore ways of shifting to a faster and more broadly based economic growth path that creates more employment than currently projected.

Trends in the Secondary Sector (manufacturing) are important for the water demand predictions. After the decline of 10.2% in 2005 and the loss of approximately 10,000 jobs between December 2004 and June 2005 through factory closures and reductions in production lines (caused by the strong exchange rate and the end of quotas under the international Agreement

on Textiles and Clothing with effect from 31st December 2004), there has been a significant recovery, with employment at LNDC-assisted companies increasing from 39,597 in September 2005 to 49,416 by June 2007 but declining to 46,328 in January 2008 and closing at 47,204 by December 2008. As a result, manufacturing is estimated to decline by 8.1 in 2008 and further trend downwards by 0.5% in 2009 but recover in 2010, 2011 and 2012 respectively by 3.5%, 7.0% and 7.1%.

These fluctuations in manufacturing are at the back of the textiles, clothing, footwear and leather and came despite the 5.5% increase in other manufacturing in 2008, 25.1% increase in 2009 and 33.7% growth in 2010. This immense growth in other manufacturing will be driven mainly by the inception of the Phillips Bulb Company as part of Government's diversification initiative.

The industry faces enormous challenge of a sudden reduction in demand due to the world economic downturn and great uncertainty as orders have not been forth coming. The industry could have been hit even harder, but the impact was offset by the depreciation of the rand against the dollar by around 30% from July 2008 to February 2009.

The manufacturing sector has also been constrained as far as factory shell space is concerned and some firms were operating at full capacity hence unable to expand whereas a few were ready to come in and invest but were constrained by lack of shell space.

Going forward, the industry is however expected to survive the prevailing storm as has been in the past and rebound by 2011. This will be achieved with the continued support to the sector by government in the form of allocations for extra shell space and development of the identified industrial sites by securing supplies of utilities and necessary infrastructure. The 2009/10 budget has allocated M60m plus a proportion of the economic stimulus package to fund infrastructure development at Ha Tikoe and Ha Nyenye industrial zones.

The construction industry is highly dependent on the level of private investment and Government's capital budget. The sector has drastically declined since 2001 as LHDA construction activities were being scaled down due to the conclusion of the construction phase of the project, but recovered and started to register positive growth in 2005 to 2007. It is expected that construction will grow further as the sector was further boosted by the Millennium Challenge Compact signed between Lesotho and the US. Major construction activities under the compact are expected to commence towards the end of 2009 to early 2010 and it is expected that the sector will grow by an average rate of 7% from 2008 to 2009. The implementation of the second phase of the Lesotho Highlands Water Project will accelerate the sector further in the medium to long term.

The electricity and water sub-sector is projected to achieve real growth of 5.3% in 2008, and average annual real growth of 6.2% from 2008 to 2012. This is based on the continued implementation of projects by both the Lesotho Electricity Corporation and WASA, which will significantly extend the coverage of their service provision. The electricity subsector however faces the challenge of supply constraint at least in the medium term and this may hamper with the Corporation's plan. An agreement to import electricity from Mozambique should help to ease the electricity supply problems in the short term.

Since achieving real growth of 6.7% in 2006, the tertiary industry has slowed to 3.4% in 2007 and projected to grow by an annual average of 4.2 from 2008 to 2012. This growth is expected to be driven by the following industries: telecommunications, financial intermediation, wholesale and retail trade and hotels and restaurants. Public expenditure on education and health is expected to grow in line with Government's commitment to achieve the Millennium Development Goals in these high priority sectors.

Overall, GNI is expected to grow at an annual average rate of 3.9% and this is expected despite the continuing downward trend in Basotho mine workers and hence the income receiv-

able from abroad[11]. The reduction in the income receivable from abroad is offset by the depreciation in the exchange rate between Loti and other major trading currencies. Intuitively, the depreciation implies the positive terms of trade effect or trading gains as exports are much cheaper but returns from the exports are higher when converted to the local currency.

This baseline growth forecast reflects the most likely economic performance by each sector. However, actual outcomes may be better or worse depending on the incidence of various threats and opportunities:

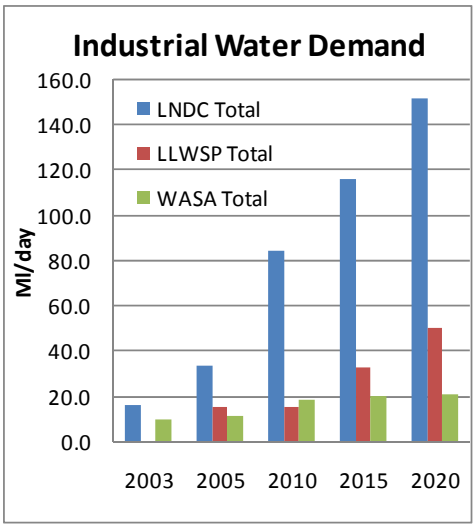
- Unfavourable weather condition and uncertainty in the agriculture industry may continue to lead to a reduction in agric output leading to a reduction in food security and hence increased poverty.
- The sudden reduction in diamond prices may continue and if prolonged, this may lead to suspension of production activities until the situation is reversed.
- Manufacturing faces great uncertainty in months to come and if the current situation is prolonged, further layoffs will be imminent.
- Inadequate supply of electricity and increased power cuts may deter investors' confidence in Lesotho.
- The extension of LHWP to the second phase coupled with the MCC may offset the impact of the current economic downturn.
- Low levels of credit extension continue to undermine the potential of the economy but the Private Sector Development component of the MCC is expected to remove some constraints

Implication for Strategic Financial Planning: given the uncertainties, the key indicators for growth in the short –term planning period could be:

- Annual GDP growth rate of 4.6%
- Continued growth in the industrial sector, possibly shifting from heavy water demanding industries such as the textiles to other types of manufacturing e.g. electrical components. This could indicate a reduced growth in industrial water demand compared to the growth in manufacturing.
- GNI is expected to grow at an annual average rate of 3.9%.

3.2.2 Water demand forecasts

Figure 12: Industrial Water Demand Forecasts



The previous forecasts for industrial demand by LNDC, the LLWSP and as projected in the WASA Financial Model[12] show large variations as illustrated on Figure 12. The LNDC forecasts are from 2004 and based on continued growth in the textile industry as experienced in the early part of the decade. With the detailed explanation provided above in 3.2.1 'Trends in the Macro-economic environment' on the ups and downs of the industries in Lesotho, and the changes in the global economy and trade, it seems more likely that the industrial growth will be in manufacturing sub-sectors other

[11] In 2007, US$443 million in remittances were sent to Lesotho. Average remittances per person were US$221, source Human Development Report 2009

[12] The WASA Financial Model only includes industries in Maseru, Maputsoe and Mafeteng, while LNDC and LLWSP also include minor industrial development in Botha Bothe, TY and Mohale's Hoek.

than textiles such as electronics that are far less water consuming.

Analysis of the historic data on water consumption on connections other than domestic from the WASA billing database indicates that there are substantial variations per year and no clear trend is obvious.

Table 5: Historic trend in non-domestic water demand' shows the average annual growth for different periods. Average industrial water demand varies between +13.8% and -4.4% in all towns while in Maseru the variation is even more extreme between 15.6% and -5.2%. The commercial consumption follows the same trend but with less variation. Government demand seems to be declining while the trend for others (schools, churches, clubs etc) seems to have a clear increase in Maseru and decrease in the other urban centres.

Table 5: Historic trend in non-domestic water demand

Total	5-year (2003/04 - 2008/09)	5-year (2002/03 - 2007/08)	6-year (2002/03 - 2008/09)	2-year (2006/07 - 2008/09)	3-year (2005/06 - 2008/09)
Industries	4.1%	13.8%	9.0%	-4.4%	1.0%
Commercial	0.7%	7.0%	4.0%	-0.1%	1.0%
Government	-1.7%	-1.7%	-1.5%	-7.8%	-2.6%
Others	0.6%	-1.1%	0.5%	-1.9%	-0.2%
Towns excl MS					
Industries	-4.6%	-6.7%	-3.3%	24.6%	11.0%
Commercial	0.5%	4.3%	4.4%	-0.5%	1.0%
Government	-2.1%	-6.0%	-3.1%	2.3%	-0.3%
Others	0.1%	-2.1%	-1.1%	-5.8%	-3.2%
MS					
Industries	4.7%	15.6%	10.1%	-5.2%	0.7%
Commercial	0.8%	8.3%	3.9%	0.0%	1.0%
Government	-1.5%	0.6%	-0.7%	-11.3%	-3.5%
Others	1.5%	0.9%	3.7%	5.3%	5.5%

Implications for Strategic Financial Planning: the historical data on water consumption and the considerations on the industrial development points towards a substantial growth in the industrial demand but far below the growth percentages experienced in the early part of the decade. Possibly a growth at 3 – 5% would be reasonable depending on the scenario for development of industries.

The commercial demand seems to follow the same trend as the industrial demand but with reduced fluctuation. Possible a growth of 2 – 3% would be reasonable to expect.

The decline in government demand is not easily explainable apart from the efforts by WASA to disconnect for non-payment. A future growth in demand of 1% might be applicable.

The demand for the other institutional connections needs to be differentiated between Maseru and the other urban centres.

3.2.3 Population and Coverage Data

The scope of the strategic financial planning, limited to water and sanitation services initially, implies that, in addition to the general data on the socio-economic development in Lesotho including population development, the data requirements will focus on data on the existing urban water and sewerage systems (WASA), the rural water and sanitation data (DRWS) and the Lesotho Lowlands Water Supply Project (LLWSP) data on the design of the bulk water systems.

Rural water and sanitation: The DRWS information system, the DIS has fairly accurate data on all the existing water systems (design population, capacity m^3/day, no of public standpipes etc.), however the population data in the DIS are grossly overestimated compared to the 2006 census data. Data are not available on un-served communities where planning and feasi-

bility studies have not been carried out. Data on sanitation is only available on the latrines that have been implemented with subsidy from DRWS.

The AWF Project on the improving the planning framework for rural water will carry out the data collection that is needed to verify and complement the rural water and sanitation data. The process of starting the project has been prolonged and the contract with the consultant supporting the project was only signed in November 2009.

When available, the BOS data on water and sanitation coverage from the 2006 population census will provide a good baseline.

Urban water and sanitation: WASA has good data on the existing water and sewerage connections, consumption and production. Data on the existing networks and production facilities not easily available. Data on assets that are important for estimating replacement investments are not available. The valuation of WASA Properties in 2006 did not include the most important assets, the pipe networks. The assets values used in the financing model and the annual accounts are based on adding new investments to the previous year's data and does thus not reflect the present replacement costs.

Table 6: Population Growth 1996-2006

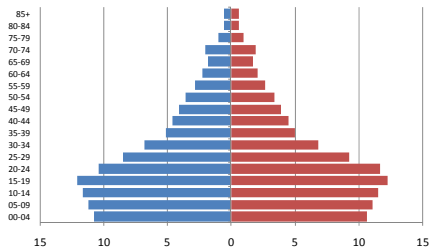
Average Annual Population Growth 1996-2006	
Lesotho total	+0.21%
Urban areas total	+3.67%
Rural areas total	-0.65%
Lowlands	-0.75%
Foothills	-0.27%
Mountains	+0.46%
Senqu River Valley	-0.34%

Population Data

The preliminary results of the 2006 population census showed that there were considerable variations between the population data in the rural water DIS and the official population statistics. The WASA Financial Model does not include projections of population in the WASA service areas.

The analysis of the census population data is in particular important since the 2006 census data shows that the population in Lesotho remained at approximately 1.8 million people as compared to earlier population projections based on the previous census indicating approximately 2.3 million people. In total the annual population growth has been only 0.21% between 1996 and 2006. Rural-urban migration is still prevalent and the urban population has been increasing with 3.67% while in general, the population in rural villages especially in the lowlands has decreased. There have been slight increases in the rural population in the mountains[13]. The data per CC and Urban area are provided in Annex A.

Figure 13: Population Pyramid 2006



The stagnating population in Lesotho is likely to be a combination of i) increased mortality due to the HIV/AIDS pandemic; ii) a high emigration rate of 2.6%[14] mainly to South Africa (93.5%) and; iii) decreasing birth rate as illustrated on the Population Pyramid in Figure 13.

To establish a better planning foundation for the water sector in terms of population data, the project implemented the following activities:

[13] The difference in population development in the highlands and lowlands is consistent with the data on HIV prevalence: 21% in the highlands and 25% in the lowlands and likely more rural-urban migration in the lowland rural areas close to the urban centers with industrial development

[14] Human Development Report 2009

- Printing of large scale maps based on aerial photos from the Geographical Information System (GIS) of the Bureau of Statistic (BOS) covering the WASA supply areas and each of the 120 Community Councils CCs);
- In cooperation with the WASA Area Managers delineating on the maps the areas covered by the existing reticulation networks;
- In cooperation with the Department of Rural Water Supply (DRWS) District Engineers marking the supply areas for the approximately 5,000 rural water supplies
- In cooperation with the BOS personnel in the GIS Unit analysing the population covered by the existing rural and urban water supply systems;
- Printing maps showing the gazetted urban boundaries as compared to the existing WASA supply areas (included in Annex H);
- Analysing the detailed census data on water and sanitation coverage according to the village list (more than 9000 villages) to provide the coverage data per WASA service area and each of the rural water supply service areas (ongoing)

The DRWS has provided additional resources required for printing of maps and analysis of rural water data to support the implementation of the project.

The demarcation of the urban boundaries compared to the present WASA networks revealed that the new urban boundaries in some of the towns[15] include large areas with typical rural villages outside the present WASA networks. The service area maps are included in Annex H. This raises the issue of the willingness to pay for water services and the appropriate/ cost effective technology in rural areas versus the aim of WASA to generate an operating profit.

[15] in particular Botha Bothe, Mohale's Hoek and Qacha's Nek and to some extent Maputsoe

Coverage

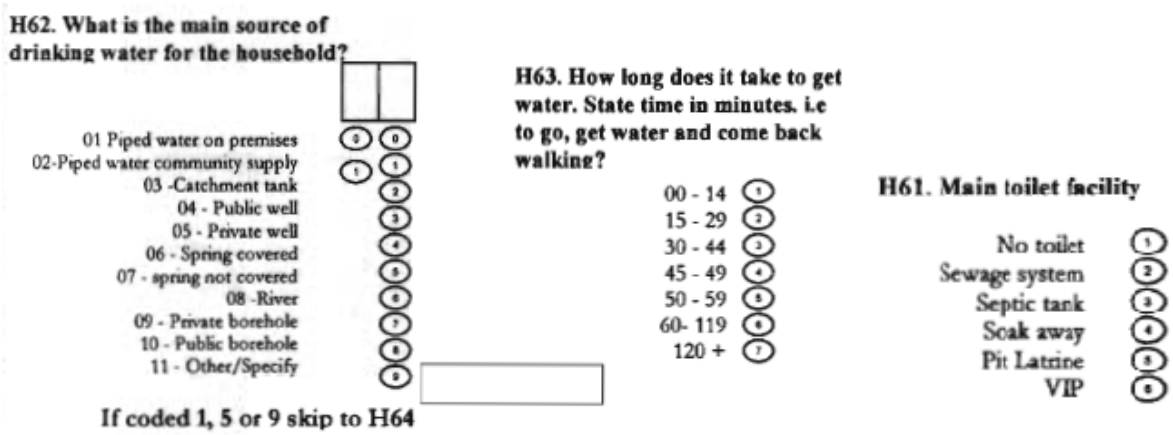
The definitions for access to water according to the Sector Performance Framework are shown in Table 7. The DIS calculates the persons covered per water system as the minimum of i) the present population in the service area, ii) the number of persons that can be supplied with 30 l/person/day, and iii) the number of persons that can be supplied allowing max 150 persons per standpipe.

Table 7: Coverage Definitions

Performance Area	Definition	Remarks
1 Access to water 1.1 Rural	a) Number of people in rural areas with access to safe water b) Number of water supply projects constructed according to national standards in rural areas	Access to a protected water source (public connection, drilling, protected source or well or rainwater cistern) supplying 30l/person/day within 150 m from household
1.2 Urban	a) Number of households in urban areas with access to potable water b) Number of house connections	Access to min. 30 l/person/day of potable water (acc. to national standards) within 150 m of the household; water delivery by WASA

When the analysis of the BOS census data on water and sanitation facilities have been completed (likely by January 2009), this will provide the baseline for sanitation to be included in the DIS and it will provide a quality check on the DRWS data on rural water systems. The BOS data include information on the water source and the collection time as shown in Figure 14. By approximating the collection time of 15 minutes to collecting water within a distance of 150 meters and with max 150 persons per collection point (else there would be queuing time), an analysis of the BOS data will provide a fair comparison to the DRWS data. It should be noted that BOS does not include data on water quantity so it is not possible to assess the access according to minimum 30 l/person/day.

Figure 14: BOS Questionnaire on Water and Sanitation



The BOS data on access to sanitation is shown in Figure 14. Coverage with sanitation can be determined as the households that use 'sewage system', 'septic tank', 'VIP' and a proportion of the households using 'pit latrines'. Some of the pit latrines would not fulfil the hygienic standards for good environmental sanitation e.g. absence of smell, access to flies etc and should not be regarded as coverage. The proportion of pit latrines to be regarded as coverage could initially be estimated based on common knowledge on the standard of latrines e.g. assuming that 10% would not fulfil the standards. In the medium term, the sector could carry out a sample survey to determine the proportion of pit latrines to be regarded as coverage and the optimal solution would be to cooperate with the BOS and develop descriptions to enable the enumerators for future household budget surveys and population censuses to classify the latrines according to hygienic standards.

The water coverage in urban areas can be determined from the existing data in three different ways:

iv. From the BOS: source of drinking water and collection time (<15 min collection time = within 150 m distance and limited queues)
v. From WASA's data on number of public standpipes and domestic connections x persons per connection
vi. From population covered by the WASA reticulation network

The data from BOS will give a picture of the water sources that people actually use while not providing the data specifically according to the coverage definition since it does not include quantity and quality.

The WASA data on connections will give a number of persons served, by assuming the average number of persons per connection (or the average consumption when also analysing the consumption data). This analysis is complicated by the fact that many households use other water sources such as rainwater to supplement the tap water.

The majority of the population within the areas covered by the WASA networks is likely to get water from the network (through own connections, illegal connections, buying from neighbours etc.) and therefore the population residing within the network area gives some indication of the coverage. This does however, with the available data, not include information on amount of water and collection distance since the network is not mapped accurately in relation to the settlements.

Table 8: Preliminary Urban Coverage Data, shows the urban population and the

i) Population covered by the existing reticulation networks according to the service area mapping;
ii) The population served based on 5[16] persons per domestic connection and 150 per public standpipe as earlier used in coverage estimates by WASA; and
iii) The SFPM estimate of the number of persons served.

The SFPM estimates the population served by combining the data on number of connections with the consumption data and assuming an average per capita consumption for the different types of connections. It also include in the population served an estimate of the persons served by the proportion of the Un-accounted for Water (UfW) that is due to illegal connections. These persons should be regarded as covered since they receive a service – only difference is that WASA is not able to connect revenue for the water delivered. The SFPM also provide an estimate of the number of persons served by connections not classified as domestic connections since of the water supplied through the commercial, government and connections to schools, institutions, clubs etc will also be used for domestic purposes. This can be because there can be combined use of premises for domestic and commercial purposes and staff quarters in institutions can be connected to the institutions water system.

The three methods naturally gives varying estimates for coverage 87%, 47% and 49% respectively.

The wide gap between the coverage figures based on service area and based on connections is an indication of the many households that live in areas covered by the reticulation network but for various reasons are not connected. Some of the variations are also due to recent substantial extension of the reticulation networks in Maseru (Peri-urban Phase II) and Maputsoe (3-Towns Project) that are covering new peri-urban areas with pipelines while it takes time for the households to connect.

[16] 5 persons per connection has been used by WASA in coverage estimates, however the WASA connection survey indicates that the average number of persons per connection is close to 6.5 taking into account the supply to rented accommodation within the compound and sale of water to neighbours.

When the BOS census data on water and sanitation are available, these data will need to be analysed in detail and the baseline coverage determined.

Table 8: Preliminary Urban Coverage Data

WASA Supply Areas	Urban Population/ service area (BOS Data) No of people	Pop covered by network No of people	Pop served with water (connections) No of people	Pop served SFPM estimates No of people	Coverage (service area) %	Coverage (connections) %	Coverage SFPM Estimates %
B. Buthe	26,354	11,704	8,465	8,108	44%	32%	31%
Leribe	15,053	12,828	8,045	10,056	85%	53%	67%
Maputsoe	40,284	31,621	12,255	12,295	78%	30%	31%
Peka	4,698	4,698	4,890	2,627	100%	104%	56%
TY	18,598	17,636	11,780	10,283	95%	63%	55%
Mapoteng	7,829	7,829	4,920	3,541	100%	63%	45%
Maseru	245,410	244,700	131,030	145,417	100%	53%	59%
Roma	10,597	8,542	2,235	2,912	81%	21%	27%
Morija	2,884	2,884	2,315	1,429	100%	80%	50%
Semonkong	5,853	5,853	0	2,562	100%	0%	0%
Mafeteng	30,577	22,905	11,720	13,378	75%	38%	44%
M. Hoek	24,756	14,223	6,405	5,492	57%	26%	22%
Quthing	12,807	8,288	4,915	4,167	65%	38%	33%
Q. Nek	10,528	5,507	3,215	2,942	52%	31%	28%
Mokhotlong	8,515	7,228	4,645	4,321	85%	55%	51%
T. Tseka	6,560	5,046	2,355	2,347	77%	36%	36%
Total	**471,303**	**411,492**	**219,190**	**231,875**	**87%**	**47%**	**49%**

The analysis of the +5000 service areas for rural water systems and the demarcation of the WASA networks have provided updated coverage data for both urban and rural areas according to the official urban/rural definitions that is different from the WASA/ DRWS demarcation that has been used in the water sector up till now. The analysis shows that there are rural water systems within the urban boundaries and urban systems serving rural areas. The use of the official demarcation is required for the water sector to compare data to the official statistics from the BOS. The results are shown in Table 9.

Table 9: Water Coverage Estimates

	Rural Areas						Urban Areas					
	Pop rural areas	Pop covered Community Schemes	Pop Served Community Schemes	Pop Served WASA Schemes	Coverage (WS exists)	Served (WS working)	Pop urban areas	Pop covered Community Schemes	Pop Served Community Schemes	Pop Served WASA Schemes	Coverage (WS exists)	Served (WS working)
Lesotho total	**1,454,803**	**851,397**	**666,468**	**17,052**	**60%**	**47%**	**484,630**	**29,794**	**27,028**	**219,401**	**51%**	**51%**
Botha Bothe	95,740	49,424	41,174	0	52%	43%	26,483	8,081	7,198	8,108	61%	58%
Leribe	229,192	121,978	107,045	2,627	54%	48%	57,074	2,018	1,943	22,365	43%	43%
Berea	177,252	129,484	96,538	3,845	75%	57%	19,022	267	267	9,980	54%	54%
Maseru	232,500	133,035	118,813	10,049	62%	55%	281,624	5,842	4,632	146,832	54%	54%
Mafeteng	166,252	111,293	60,203	0	67%	36%	33,483	1,097	940	13,378	43%	43%
Mohale's Hoek	152,481	90,800	75,102	0	60%	49%	25,947	3,696	3,546	5,492	35%	35%
Quthing	108,340	57,390	53,170	0	53%	49%	12,724	2,952	2,662	4,167	56%	54%
Qacha's Nek	61,984	44,211	36,137	0	71%	58%	11,306	3,805	3,805	2,942	60%	60%
Mokhotlong	98,775	55,397	36,157	0	56%	37%	9,851	878	878	4,321	53%	53%
Thaba Tseka	132,288	58,384	42,130	531	45%	32%	7,117	1,158	1,158	1,816	42%	42%

The baseline for sanitation coverage will only be available when the detailed analysis of the BOS data on water and sanitation has been completed according to the village list linked to the codes for DRWS and WASA service areas (expected April 2010). The present data from BOS on sanitation is from the 2003/03 household budget survey as shown in Table 10.

Table 10: Sanitation Coverage BOS-2002/03

Percentage distribution of households by type of toilet facility and region

Type of toilet	Maseru urban	Other Urban	Rural Lowland	Rural Foothill	Rural Mountain	Rural SRV	Lesotho
No toilet	2.8%	14.2%	40.5%	56.6%	87.6%	67.7%	33.9%
Sewage system	14.4%	5.8%	0.1%	0.2%	0.2%	0.0%	4.4%
Own pit latrine	32.9%	26.3%	40.6%	27.1%	5.5%	11.0%	27.1%
Own VIP	30.7%	39.7%	17.4%	15.4%	6.2%	21.0%	26.2%
Public/ shared	19.0%	13.1%	0.3%	0.3%	0.0%	0.3%	7.8%
Other	0.1%	0.8%	1.1%	0.4%	0.4%	0.0%	0.7%
Total	100%	100%	100%	100%	100%	100%	100%

The coverage with sewerage systems for domestic waste disposal can also be deducted from WASA's data on sewerage connections as presented in Table 11 showing considerably lower coverage estimates than the data listed in Table 10 e.g. the coverage with sewerage in Maseru is only 2% as compared to the BOS statistics of 14.4%. The main reason for this is probably that the classification of 'sewage system' in the BOS survey includes the households using septic tanks.

Table 11: Sewerage Coverage based on Connections

WASA Supply Areas	No of Domestic Sewerage Connections	Sewerage Coverage (%)
B. Buthe	39	0.6%
Leribe	3	0.1%
Maputsoe	0	0.2%
Peka	0	0.0%
TY	23	0.5%
Mapoteng	0	0.0%
Maseru	1,268	2.0%
Roma	3	0.1%
Morija	14	2.0%
Semonkong	0	0.0%
Mafeteng	39	0.5%
M. Hoek	4	0.1%
Quthing	15	0.5%
Q. Nek	0	0.0%
Mokhotlong	38	1.5%
T. Tseka	81	4.6%
Total	**1,527**	1.0%

Implications for Strategic Financial Planning: the analysis of the 2006 population census data is vital for providing reasonable accurate statistics and population data per service area in both rural and urban areas. The BOS data also needed for analysis of access to water and sanitation services.

To determine sanitation coverage from the BOS data, the water sector could carry out a sample survey to determine the proportion of pit latrine to be regarded as coverage. In the longer term, cooperation with BOS to clarify the classification of sanitation technologies to give a better picture of sanitation coverage would be needed.

The present water infrastructure data does not provide accurate data on urban coverage. To improve this, it would be needed to carry out GIS mapping of the urban water networks to determine the population within 150 m of the network.

The connection survey started by this project should also be completed in order to provide accurate statistics on the number of persons served per connection and the amount of water used per person.

It needs to be considered whether or not households that buy their water from neighbours at high cost should be regarded as covered.

The AWF project when eventually implemented with provide accurate data on the rural water coverage since the project is expected to include GIS mapping and updating of the capacity and other information on the water infrastructure as well as sanitation facilities. The GIS mapping will enable accurate determination of population data when integrated with the BOS GIS.

3.3 Financial Dimensions

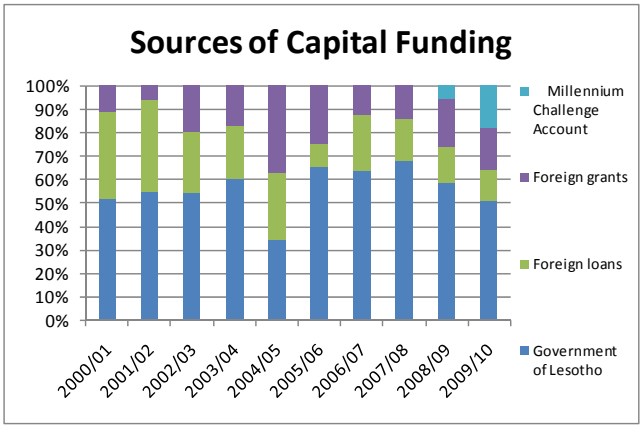
The water services sub-sector receives funding from the recurrent and capital government budgets as well as funding from bilateral and multilateral financiers. An overview over the historic and present funding is presented in Table 12[17] based on information from the MTEF, the draft Sector Programme and the MCC Compact.

The present level of funding to the water services is 4.5% of the total GOL budget, a small proportion of 0.5% of the recurrent budget and a considerable proportion of 13.5% of the capital budget raising to 22.7% in 2010/11 mainly due to the considerable funding from the WB and EU for urban water and sewerage and the coming MCC funding to the water sector.

Table 12: Estimated Funding available for 'Water Services'

Cost Centre/Project	2007/08	2008/09	2009/10	2010/11
Recurrent Estimates (mLSL)	**23.98**	**25.86**	**27.69**	**29.61**
Water Commission	5.63	6.23	6.62	6.95
Rural Water Supply	18.35	19.64	21.07	22.66
Capital Estimates (mLSL)	**260.72**	**316.32**	**392.07**	**371.38**
Metolong	60.00	6.07	6.07	10.00
EAPPs	4.00	9.00	9.00	9.00
Lesotho Water Sector Improvement	34.00	60.00	60.00	60.00
Maseru Peri Urban Water Supply Phase I	5.29	4.00	-	-
Maseru Peri Urban Water Supply Phase II	50.67	50.00	6.00	-
Maseru Waste Water	35.27	38.65	80.08	74.50
Six Towns Water Supply Phase II	32.25	96.00	71.80	-
Maseru Waste Water Immediate Measures	18.00	-	-	-
Village Water Supplies	21.25	31.00	41.00	51.00
Planned add funding to Rural Water (EU)		20.60	60.00	20.00
Estimated LG spending on rural water		1.00	1.00	1.00
MCC Metolong Bulk Water Conveyance			10.43	40.60
MCC Metolong PMU			9.73	11.13
MCC Urban and Peri-urban			8.75	45.64
MCC WASA PMU			3.21	3.21
MCC Rural Water and Sanitation			25.00	45.30
Total 'Water Services' Budget (mLSL)	**284.70**	**342.18**	**419.75**	**400.99**
GOL Recurrent Budget Total	4,404.40	5,375.22	5,740.39	6,153.32
GOL Capital Budget Total	1,924.21	2,157.13	1,978.72	1,635.14
'Water Services' as % of total GOL Recurrent	0.54%	0.48%	0.48%	0.48%
'Water Services' as % of total GOL Capital	13.55%	14.66%	19.81%	22.71%
'Water Services' as % of total GOL	4.50%	4.54%	5.44%	5.15%

Figure 15: Sources of Capital Funding

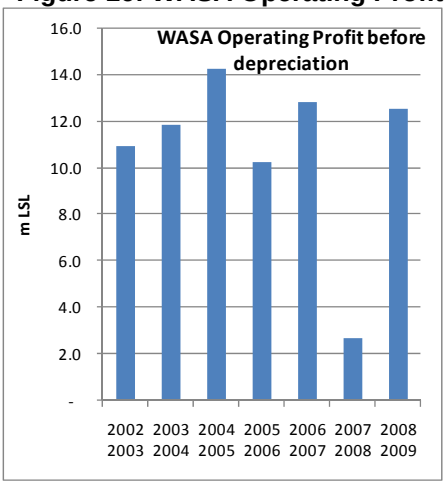


The sources of capital funding on the Government budget are shown on Figure 15. The historical data seems to indicate that the GOL is directly contributing approximately 50% to the capital budget. Although this might not be representative for the water sector in the near future with the larger investments in the Metolong and possibly other bulk water systems, that could be predominantly foreign loan and grant funded, it could possibly be used as a general aim in forecasting investment flows to the sector.

[17] This data on sector funding has been updated with funding estimates from the new 2010/11 Budget Framework Paper as shown in the funding estimates in Chapter 4.

The available funding in Table 12 includes an estimated contribution of 1.0 mLSL per year by the Local Authorities to rural water and sanitation services. The Local Authorities are using some of their development funding for rural water systems, both new investments and support to communities for maintenance and major breakdowns.

Figure 16: WASA Operating Profit



In addition to the funding listed in Table 12, WASA generates operating profit as indicated in Figure 16. The operating profit is utilised for investments in infrastructure such as network extensions and replacement of equipment.

In addition to the 'on-budget' funding there is also some 'off-budget' funding especially to the rural water sector from NGOs. In the DRWS DIS estimated to approximately 1.0 mLSL per year.

The investments by private individuals in 'self supply' should also be taken into account to get a more complete picture of the investment flows for water services. According to the surveys in peri-urban areas 7% have supply from own borehole and from the WASA connection survey indicates that 8% use own borehole water to supplement the WASA supply. A larger proportion of approximately 30% of households supplement the utility water supply with rainwater harvesting. This represents a considerable investment in 'self supply'.

The self-supply seems to serve three main purposes:

i) to supplement the public water supplies in order to provide a higher level of service (in the case of own boreholes in peri-urban areas with community based public standpipes or hand pumps)
ii) to compensate for the interrupted or inadequate utility supply (in case of own boreholes and rainwater harvesting in areas covered by the WASA network as well as the considerable investment in water storage)
iii) to supplement the utility water supply, perceived to be expensive in order to save money (in the case of rainwater harvesting)

It is therefore complex to take self supply into account when analysing the investment requirements in terms of coverage targets since these investments overlap with the public investments in that it supplements the public water supplies.

Private investments in water supplies to serve communities or sections of towns does not seem to be prevalent in Lesotho except on a small scale where one household invests in a borehole supply and sells water to neighbours. As revealed by the peri-urban survey this is case for 7% of the households serving 11% of households in peri-urban areas. In this case the investment is not done in the community water services as such but more as a by-product of investing in water supply for self supply.

Implications for Strategic Financial Planning: the investment flows to the urban sub-sector are reasonably well known as they constitute specific projects and the financing generated by WASA's operating profits.

The rural water funding is more complex as in addition to the government and on-budget donor there are other investments through Local Authorities and NGOs that are not captured in the Government's financial management system.

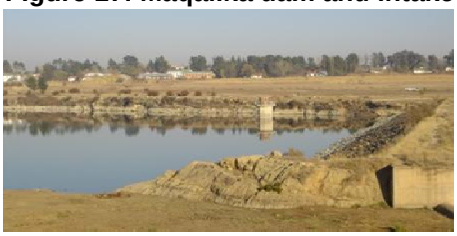
3.4 Technical/ Engineering Dimensions

The technical aspects of water and sanitation services in Lesotho are described below under the headings 'Urban Water', Urban Sewerage', 'Rural Water and Sanitation' and the planned 'Lowlands Bulk Water Schemes'.

3.4.1 Urban water services

Piped water systems in 15 major centres using surface or groundwater sources with various levels of treatment:

Figure 17: Maqalika dam and intake



Maseru: surface water from Mohokare/ Caledon river and Maqalika dam with a capacity of 65,000 m3/day (when present upgrading work and Tikoe WTP is completed). The capacity utilisation will be 53% based on the present number of connections. The service area population of 275,000 people of which approximately 50% can be regarded as served based on the present number of connections. The Maseru Peri-urban Phase II project has extended the reticulation network in the south western areas of Maseru and a sharp increase in the number of connections is expected. The water sources for Maseru also serves the Mazenod area where the reticulation system is presently under construction serving an additional xx people.

Botha Bothe: surface from Moroeroe stream (WTP capacity 280m^3/day) and groundwater (10 boreholes with a combined capacity of 770 m^3/day). The capacity utilisation is 89%. Service area population 26,500 people of which 31% can be regarded as served by the WASA system and xx% by existing rural water systems.

Figure 18: Existing Well Point in Hlotse River

Leribe: water sources are from well points in the Hlotse River, with a design yield of 950 m^3/day and four production boreholes with a yield of 280 m^3/day. These sources are not in full use and surface water from the Hlotse river with a new package WTP with a capacity of 2,500 m^3/day supplies Hlotse. The capacity utilisation is 51%. Service area population is 15,400 people of which 65% can be regarded as served.

Maputsoe: existing source from well field in Mohokare river and boreholes. 10 new boreholes developed as part of the 3-towns project providing with the existing boreholes a combined capacity of 5,800 m^3/day. With the present number of connections the capacity utilisation will be 37% when the new sources are operational. The service area population is 42,000 people of which 29% can be regarded as covered with the present number of connections. The 3-towns project is extending the reticulation system and a sharp increase in the number of connections is expected.

Peka; A number of well points in the Mohokare River. Only chlorination as treatment. Capacity of 300m^3/day[18] with 62% capacity utilisation. Service area population of 4,700 people of which 56% can be regarded as served.

Teyateyaneng: existing surface water and well fields in the Phutiatsane River combined with boreholes. 11 new boreholes developed under by the 3-towns project with a capacity of 2,400 m^3/day in addition to the existing capacity of 1,560 m^3/day gives a combined capacity of 3,960 m^3/day. Capacity utilisation will be 29% when the new sources are operational. Service area population is 19,000 people with 54% regarded as served.

[18] The LLWSP Design reports states that the Peka intake and pumps are rated to supply 1 200 m^3/day

Mapoteng: gravity water supply through a 12 km pipeline from a stream in the mountains. The minimum yield of the source is 300 m^3/day however this is only experienced during drought so the normal capacity of the source is around 600 m^3/day. The gravity source is supplemented by a borehole at the hospital with an estimated yield of 30m3/day. The demand exceeds the drought yield of the sources. The service area population is 8,000 people of which 44% can be regarded as served.

Roma: existing borehole and surface water source with a package WTP with an existing capacity of 2,500 m^3/day. The 3-towns project has developed new boreholes with a combined yield of 2,600 m3/day giving a total capacity of 5,100 m^3/day. The system serves the National University and a service area population of 10,800 persons of which 27% can be regarded as covered.

Figure 19: Reservoir in Morija

Morija: existing borehole sources (capacity approx 105m^3/day) and small package treatment plant using surface water from a small dam with a capacity of 80 m^3/day giving a present capacity of 185 m^3/day. The present demand exceeds the capacity. Service area population is 2,800 people of which 51% can be regarded as served.

Semonkong: new water scheme planned to be implemented through the MCC project. The project will include the rehabilitation of existing borehole water supply scheme with nine boreholes fully equipped, supply and installation of 9 pumps at springs and supply and installation of chlorination/Water Treatment facility, 15 750m of transmission pipeline. Service area population is 6,360 persons.

Mafeteng: Surface water from Rasebala dam (source capacity of 2,200 m^3/day and WTP with capacity of 600m^3/day + two boreholes that the WTP site with capacity of 250 m^3/day. Old WTP from the Raleting Dam close to town with a capacity of approximately 600 m^3/day is no longer in use. The total existing capacity is thus 850 m^3/day however this needs to be confirmed as the average production in 2008/09 has been 1,600 m^3/day. The service area population is 30,600 people of which 40% can be regarded as served

Mohale's Hoek: Surface water from the Makhaleng River and a WTP with sedimentation and filtration with a capacity of 800 m^3/day supplemented with sub-sand abstraction system and well points in the Makhaleng River. Additional borehole source with a capacity of 50 m^3/day and a well supplying 150 m^3/day. The total existing capacity is approximately 1,500 m^3/day with a 70% capacity utilisation. The service area population is 2,800 people of which 51% can be regarded as served.

Figure 20: Quthing WTP

Quthing: infiltration gallery in the Qomoqomong River and with a capacity of normal capacity of 864 m^3/day however in drought conditions only 415 m^3/day. WTP with slow sand filters. Delivery pumping capacity of 870 m^3/day with a 81% capacity utilisation (demand exceeds the capacity in drought periods). Service area population is 12,700 people of which 33% can be regarded as served.

Qacha's Nek: surface water intake and Sejabatho WTP with a capacity of 600 m^3/day supplemented by the Hill side spring with a capacity of 150 m^3/day and the Mosaqane spring with a capacity of 120 m^3/day. The 3 existing BHs have been closed and are no longer in use. Total capacity is 870 m3/day with a 66% capacity utilisation. The service area population is 11,300 people of which 26% can be regarded as served.

Mokhotlong: stream sources and treatment plant with a capacity of 600 m^3/day and capacity utilisation of close to 100%. The service area population is 9,800 people of which 44% can be regarded as served.

Thaba Tseka: stream sources and treatment plant with a capacity of 2,500 m3/day and a capacity utilisation of only 17%. The service area population is 7,100 people of which 33% can be regarded as served.

Many of the urban water systems have operational problems as indicated by the low capacity utilisation combined with interrupted water service in many of the systems. The reasons for the operational problems are diverse e.g.:

- Natural physical conditions such as large variations in the water flows in many of the rivers and streams that are used as sources for the water systems as well as the very high sediment load in the lowlands rivers that are the sources of the major WASA systems as illustrated by Figure 18 showing the water quality in the Hlotse River. This river will also be the source for the planned bulk water system for Zone 2&3.
- Inadequate replacement of equipment that has outlived its lifespan.
- Many of the existing intake structures with infiltration galleries and well points (e.g. Hlotse, Maputsoe and Teyateyaneng) and borehole sources (e.g. Botha Bothe, Teyateyaneng, Roma, Morija) are no longer fully utilised, possibly due to design issues or inadequate preventative maintenance/ operating procedures.

Levels of Un-accouted for Water (UfW) in the WASA systems are moderate to high as shown in Table 13.

Table 13: UfW in WASA Systems

WASA Supply Areas	Un-accounted for Water
B. Buthe	30%
Leribe	24%
Maputsoe	44%
Peka	25%
TY	44%
Mapoteng	31%
Maseru	30%
Roma	15%
Morija	22%
Semonkong	
Mafeteng	33%
M. Hoek	53%
Quthing	51%
Q. Nek	43%
Mokhotlong	21%
T. Tseka	27%
Average	31%

The recent work by the 3-towns project in Maputsoe, Teyateyaneng and Roma indicates that under registration of consumption due to old water meters is one of the major contributors.

The ongoing replacement of old pipelines in Maputsoe, Teyateyaneng and Roma by the 3-towns project and the pipeline rehabilitation under the MCC project in Maseru, Roma, Mohale's Hoek, Qacha's Nek, Botha Bothe, Leribe and Teyateyaneng will considerably reduce the UfW related to leaks.

The design of new urban water systems are using the following per capita consumption estimates[19]:

- Full-pressure metered house connections (120 l/c/d).
- Full-pressure metered Yard Connection (60 l/c/d)
- Public metered standpipe (25 l/c/d)

Based on the projected mix of the various levels of service the lowlands project recommended a mean domestic water demand of 60 l/c/d exclusive of water losses.

Implications for the Strategic Financial Planning: the financial estimates shall include full replacement costs – the lack of up to date register of the value of the WASA assets needs to be addressed.

There is a need to analyse the cost benefits of a consistent meter calibration and replacement procedures by WASA, possibly in conjunction with implementation of pre-paid meters

[19] From the 6-towns design reports

3.4.2 Urban Sewerage Services

WASA operates sewage collection systems and treatment plants in most of the urban centres. Only Peka, Semonkong and Qacha's Nek does not have sewage systems. The sewerage systems typically serve the commercial centres of the towns and has little domestic coverage. Only 10% of the sewerage discharge billed by WASA is from domestic sources. The use of coverage (the proportion of the population served for domestic purposes) as a measure for sewerage services is therefore not always appropriate.

The sewerage system in Maseru include the collection network and 10 pumping stations delivering the sewage to the Ratjomose wastewater treatment plant. The treatment include some mechanical treatment and oxidation ponds. The design capacity of the plant is 10,000 m^3/day.

Table 14: Sewerage Connections and Volumes

WASA Supply Areas	No of Domestic Sew.Con	No of non-Domestic Sew.Con	Sewage volumes (m^3/day)
B. Buthe	39	67	301
Leribe	3	4	215
Maputsoe	0	146	561
Peka	0	0	0
TY	23	3	60
Mapoteng	0	1	91
Maseru	1,268	650	9,677
Roma	3	8	660
Morija	14	9	128
Semonkong	0	0	0
Mafeteng	39	48	411
M. Hoek	4	16	68
Quthing	15	11	131
Q. Nek	0	0	0
Mokhotlong	38	16	155
T. Tseka	81	40	103
Total	**1,527**	**1,019**	12,561

The pumping stations and the mechanical and electrical equipment at Ratjomose were renovated in 2008. WASA is presently with the assistance from the EU implementing improvements to the sewage system in Maseru through the refurbishment and upgrading of the Ratjomose treatment plant, and construction of a new treatment plant at the Agric college as well as rehabilitation, infilling and extension of sewerage systems in the Ratjomose catchment area and installation of new sewerage systems in the Agric College catchment area. The project also includes support to households in the construction of on-site disposal systems (VIPs).

In the centres outside Maseru, the sewage systems are based on oxidation ponds in consisting of anaerobic ponds and/or imhoff tanks, one facultative pond and two maturation ponds. Data on the sewerage networks, sewage flows and pond system capacities are not available, however, approximate capacities can be deduced from the sewage billing data that gives a picture of the amount of sewage entering the systems. WASA is in the process of collecting the data on the existing sewerage systems and treatment plants.

Figure 21: Industrial effluent in Ha Tsetsane

The effluent from industries in Maseru does not all enter the WASA sewerage system. The water supplied to industries is approximately 11,000 m^3/day while the sewerage volume billed from the industries is only 1,200 m^3/day or 10% of the water consumption. Portions of the industrial discharge that does not enter WASA's system is treated on site by the industries but a large proportion flows untreated into the water courses as illustrated on Figure 21 showing the dark blue water in a stream down-streams from the textile factories.

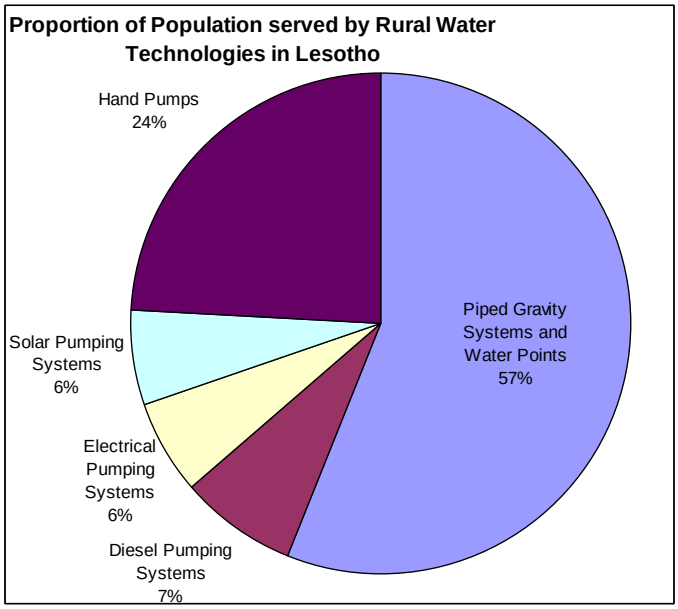
Implications for the Strategic Financial Planning: the financial estimates for sewerage coverage shall be updated and improved as soon as better data on the existing sewerage systems becomes available.

Coverage for domestic purposes might not be an appropriate indicator to use as targets for sewerage investments since the majority of sewerage discharge is from non-domestic sources.

The very low coverage for domestic sewerage and the small proportion of industrial discharge in Maseru that presently enters the sewerage system indicate that large investments will be needed in sewerage coverage in Maseru and the other industrial towns to reduce the environmental pollution and safeguard the water resources.

3.4.3 Rural Water and Sanitation

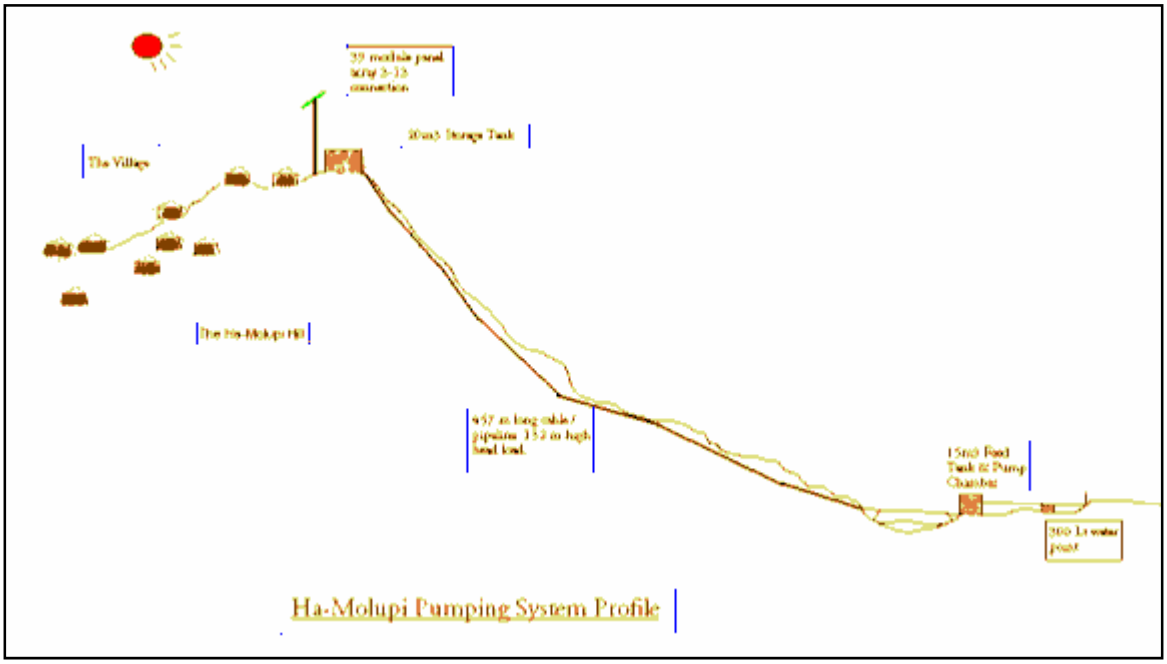
Figure 22: Rural Water Technologies



Rural water supplies in Lesotho are typically simple piped water systems serving individual villages. If possible **gravity systems** are built, using water sources above the village, or if that is not possible **pumping systems** are installed from either boreholes or springs using diesel, electrical or solar pumps.

These small systems typically serve between 200 and 2000 people. A typical layout of a pumping system is illustrated in Figure 23. In addition to the piped systems, approximately 25% of the rural population with access to potable water is served by **hand pumps**. These are mostly located in the lowlands communities.

Figure 23: Typical Rural Water Supply System with Solar Pumping



Source: *Mantsunyane W&S Project Annual Report 2004/05*

Figure 24: Typical RWS Reservoir in Natural Stone

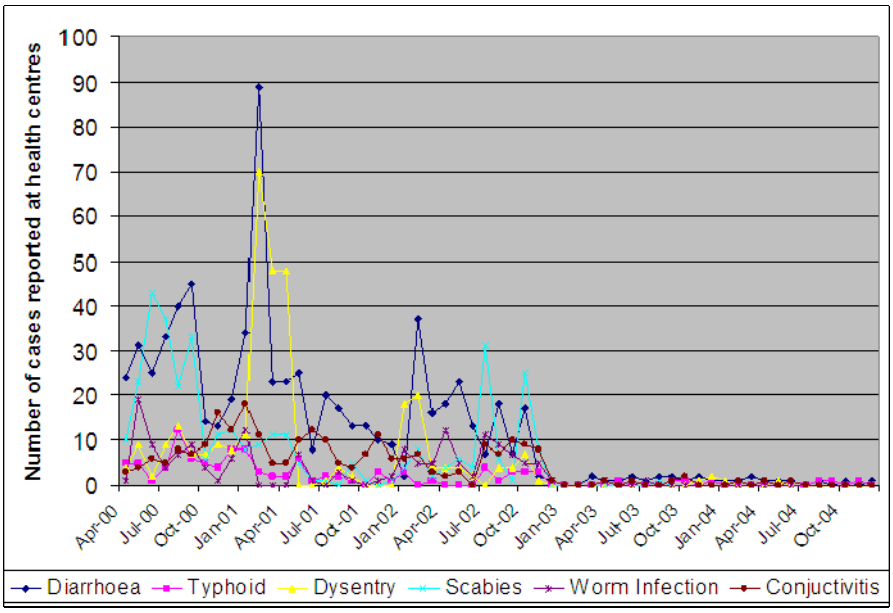
It is anticipated that in the future DRWS will utilise streams and simple treatment plants to satisfy the water demand in more densely populated areas. The first of such schemes is under implementation in the Pitseng area in Leribe District serving approximately 20,000 people.

The bulk water systems planned for the lowland areas of Lesotho will cover some of the rural settlements with populations over 2,500.

The combined effort of providing clean water, sanitation facilities and hygiene education is important for the health of the rural population. Figure 25 illustrates the effect on water related diseases after the implementation of a rural water and sanitation projects in the health area for Mantsunyane Hospital in Thaba Tseka district[20]. Combined with the individual benefitting from improved health, there is an economic benefit for the society at large in terms of reduced health service cost and improved productive capacity of the population. Quantifying these aspects might be complex however it could be attempted in future development of the SFPM.

The sanitation options in rural village are limited to pit latrines. Very few households have water borne sanitation, the BOS statistics indicate that 0.1 – 0.2% of the rural population use what is classified as 'sewage systems' probably septic tanks discharging to an underground soak-away or drain.

Figure 25: Frequency of water related diseases and implementation of water supplies



Source: Mantšunyane Water and Sanitation Supply Project

The priority areas for the rural water and sanitation program are: i) rehabilitating and expanding existing water systems in the lowlands that are no longer providing adequate service; and ii) increasing coverage in previously un-served communities predominantly in the more remote and mountainous areas of the country.

[20] Projects implemented in the Lesobeng, a remote mountain area. Based on data from the health statistics from clinics under the Mantsunyane hospital covering the same area as the water supply projects

Lowlands

There are multiple reasons why some of the existing water systems in the densely populated lowlands are in need of rehabilitation – some of these are:

Figure 26: Operation of hand pumps

- Many of the systems were built in the 1980s and are now beyond their design life of 25 years and have critical components that must be replaced.
- The population growth in the lowland villages since implementation has resulted in inadequate capacity of the systems both in terms of the quantity of water provided per capita and the extent of the pipe network.
- A significant proportion of lowland villages were served by hand pumps in the 1980s, but these no longer provide an adequate level of service for the growing population. Increased population pressure has resulted in the reliable hand pumps being overused and suffering damage. As they are expensive and difficult to maintain at community level the ratio of population served to operating hand pumps has risen rapidly. They are also unpopular and difficult to operate by women, children, the aged and the disabled as illustrated on Figure 26.
- The majority of villages in Lesotho are served by gravity water systems based on spring sources. In many parts of the lowlands the yields of the springs have been affected negatively by reduced recharge of ground water resources due to degradation of the catchment areas. The decline in spring yields coupled with population growth means these systems no longer meet the required standard of 30 liters per capita per day (l/c/d) and will require augmentation from additional springs or from new pumped boreholes.
- Inadequate maintenance, in particular preventive maintenance, has resulted in some systems requiring major rehabilitation. The establishment of the new local government structures and the recently approved rural water supply 'After Care Strategy' is expected to alleviate many of the problem areas that have previously led to lack of clarity in the responsibilities for management of the existing systems.

Figure 27: typical lowland village

In some cases, where the locally available sources are no longer adequate to provide a reliable service, regional water schemes will be proposed to augment the existing schemes by using a

larger more reliable source, e.g. a stream located at a higher elevation than the supply area. These regional schemes will typically serve 20 to 30 villages

Figure 28: Typical village in the highlands

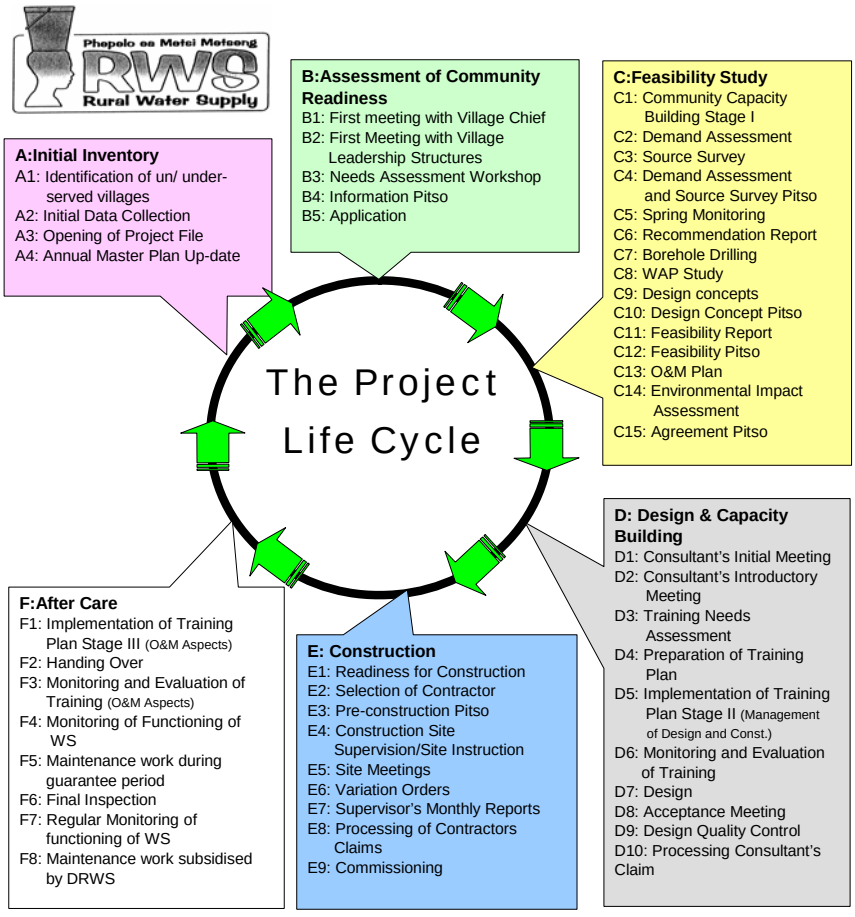
Highlands

The second priority is to reach the un-served villages that are typically in the more remote mountainous areas of Lesotho. Larger communities in easily accessible areas have in the past been given priority, leaving the smaller more remote communities without adequate water and sanitation facilities. Provision of better infrastructure including water and sanitation in these communities will potentially contribute to reducing migration to the urban areas and the resulting high levels of unemployment.

The implementation unit costs in these remote villages are considerably higher than in the lowland villages, due to i) the size of the schemes and ii) the transport costs. All the 10 districts except Mafeteng has mountain areas and typically 10% the 20% of the villages are inaccessible meaning that there is no road access and materials need to be carried on foot or by donkeys or horses.

The RWS projects are implemented according to the 'DRWS Project Life Cycle' as illustrated on Figure 29. The project life cycle prescribes that the communities are involved in all steps in the planning, design and implementation of the systems to enhance the ownership and includes specific community capacity building activities to improve the capacity to manage, operate and maintain the systems. The community involvement in the implementation and the capacity building activities needs to be costed and included in the estimates of investment needs.

Figure 29: DRWS Project Life Cycle



The present RWS design standards allow for private connections in the rural water systems, however due to different reasons as documented in the 'survey on private connections in rural areas' as described in Annex D. One of the main reasons seems to be the cost of providing the additional capacity in the water systems from the very reasonable point of view of *'some for all – not all for some'* that points towards providing a basic level of service to all communities before a higher level of service is provided to some communities.

The RWS designs also do not include water for productive uses although this could potentially have a positive impact on poverty alleviation and improve the livelihood in rural areas. Since the main economic activity in rural areas is subsistence agriculture and livestock, this would need close coordination with other stakeholders such as the local authorities and government departments responsible for catchment management, range management and irrigation.

Implications for the Strategic Financial Planning: the future technology mix is important for costing the investments in rural water. From the description above it is clear that the future technology mix will be affected by:

- The reliability and yields of spring sources are declining due to degradation of the catchment areas and this is expected to be exacerbated by climate change with more erratic rainfall patterns. This indicates that in the future more systems will be based on pumping from the more drought resistant boreholes with higher implementation and O&M costs than gravity systems;
- Hand pumps will be replaced by pumping systems;
- Some rural areas will be served by the lowlands bulk water systems and other areas might be most cost effectively and sustainably served by regional schemes based on surface water sources - preferably gravity sources from the mountain areas where there will be limited need for treatment.

The planning tools shall estimate the cost of implementing the present implementation strategy for sanitation using close to 90% subsidy for household latrines.

The possible future development of the SFPM to cover strategic financial planning for the full IWRM scope would address the present lack of emphasis on water for productive uses.

Future versions of the SFPM could also attempt to include quantify the health and economic benefits from rural water and sanitation projects and the effect on the economy.

3.4.4 Lowlands Bulk Water Schemes

Figure 30: Map of LLWSP Demand Zones

Recognition the importance of providing adequate water supplies to the domestic and commercial consumers in the Lowlands of Lesotho, the GOL carried out a feasibility study for the Lesotho Lowlands Water Supply Project (LLWSP) in 2004 and subsequently the design of the five bulk water supply schemes serving eight designated water demand zones. The demarcation of the 8 zones is shown on Figure 30.

The purpose of the proposed LLWSP to improve water supplies to the lowland settlements with populations in excess of 2500 for domestic, institutional and industrial purposes. The aim of the project is to support the introduction of technically, economically, socially, environmentally and financially viable, bulk-treated water supply systems.

The main project components include intake points, water treatment works, pump stations and reservoirs and transmission pipelines. The bulk water schemes will feed the existing reservoirs and reticulation systems in the urban areas and rural villages.

For all the zones, the proposed water treatment process consists of pre-oxidation of the raw water with chlorine to disinfect and oxidize the potentially elevated manganese and iron present in the water followed by aeration cascade, grit removal system, coagulation /sedimentation / clarification and rapid gravity filtration. Filtration would be followed by chlorination using gaseous chlorine. Chlorine would be dosed into the feed line into clear water storage/transfer tank at the water treatment plant before being fed into the distribution system

Zone 1 – Butha Buthe: will be served by abstraction from the Hololo River and water treatment with a design capacity of 37,000 m^3/day in 2020 and 61,000 m^3/day in 2035. The transmission includes 15 pumping stations and conveyance through 108 km pipelines ranging in diameter from 80mm to 700mm to approximately 30 reservoirs near target settlements. The guaranteed minimum flow of the Hololo River is 38,300 m^3/day and temporary deficit during extremely dry periods can be augmented from the Lesotho Highlands Scheme at Muela.

The infrastructure has been designed to accommodate future growth at the Butha-Buthe Industrial Estate being developed by Lesotho National Development Corporation (LNDC). The settlements to be served in Zone 1 are: Butha Buthe, Makhunoane, Qholaqhoe, Seboche, Phelantabe, Khukune, Qalo, Serutle, Selomo, Makong, Phooko, Rampais Nek, Nqechane, Jonathane, Pitsi's Nek and Khabo.

Zones 2 & 3 - Hlotse, Maputsoe and Peka will be served by a single scheme supplied from the Hlotse River with treatment works near Ha Mokotane with a design capacity of 56,000 m^3/day in 2020 and 70,000 m^3/day in 2035. The transmission will include 14 pumping stations and 144 km of pipelines ranging in diameter from 100mm to 900mm conveying the water to 25 reservoirs.

The minimum flow in the Hlotse River is 42,700 m^3/day and should there be insufficient flow during extremely dry periods, it can be augmented by occasional releases of water from the LHWP using the Hlotse Adit located in Tšehlanyane National Park

The design includes provision for the anticipated industrial development at Maputsoe. The settlements to be served in Zone 2 & 3 are: Maputsoe, Hlotse/Leribe, Tsikoane, Khanyane, Pitseng, Mahobong, Likhetlane, Makhoa, Matlameng, Nchee, Tabola, Corn Exchange, Kolojane, Bela Bela, Peka, Hleoheng, Makhaketsa, Mohlokaqala, Kolonyama and Mamathe.

Zones 3&4 – Maseru, Teyateyaneng, Roma, Morija water systems will be supplemented by the new scheme from the Metolong Dam on the Phuthiatsana River and water treatment works for which the implementation has started, managed by the Metolong Authority.

The Metolong WTW with a capacity of 75,000 m^3/day will supply a command reservoir 3.2km from the treatment plant and distribute from there to Maseru, Roma, Morija and Teyateyaneng covering rural settlements located close to the pipeline route.

In Zone 4, a small amount of additional pumping is required to supply the settlements of Nazareth, Ntsi, Metolong, Koro Koro and Mantsebo through a total of 24 reservoirs and 358 km of pipeline in Zone 4 of which 149km are 150mm or below and the remaining are of sizes from 200mm to 1168mm.

In Zone 5 three smaller pumping stations are required to lift water from the end of the Zone 5 gravity-fed system to the areas around Tsa Kholo, Ha Makhakhe and Matelile. The Zone 5 systems covers 21 reservoirs.

Zone 6&7 – Mafeteng and Mohale's Hoek will be supplied from a scheme comprising a raw water intake on the Makhaleng River, a treatment plant with a capacity of 54,000 m^3/day in 2020 and 60,000 m^3/day in 2035, 9 pumping stations, 16 reservoirs and a total of 100.7km of pipelines ranging in diameter from 100mm to 500mm in Zone 6 and in Zone 7, 3 pumping stations, 7 reservoirs and a total of 24km of pipelines ranging in diameter from 100mm to 600mm.

Mafeteng town and the settlements of Qalabane, Van Rooyen, Ramohapi, Matlapaneng, Thabana Morena and Khobotle will be served in Zone 6 and Mohale's Hoek and the settlements of Maphohloane, Tšepo and Mesitsaneng will be served in Zone 7.

The design of the Makhaleng River intake is based on the assumption that there will be sufficient flow in the river for eventual peak intake abstraction of 0.764m3/s, as well as providing for the environmental inflow requirements (IFR) downstream of the intake as far as the Senqu River and any other abstractions upstream of the intake. The river flow at the Senqu intake is much greater than the abstraction rate. The design of the intake is based on the assumption that there will be sufficient flow in the river for the eventual peak intake abstraction of 0.074m3/s, as well as providing for the environmental IFR downstream of the intake as far as the Lesotho border with South Africa, and any other abstractions upstream of the intake.

Zone 8 – Quthing will be supplied from a raw water intake on the Senqu River, a water treatment plant with a capacity of 5,100 m^3/day in 2020 and 5,800 m^3/day in 2035, 3 pumping stations, 4 reservoirs and 33km of pipelines ranging in diameter from 100mm to 355mm. The scheme will serve Quthing (Moyeni), Qomoqomong, Alwynskop, Ntho and Tele Bridge.

Implications for the Strategic Financial Planning: the planning tools with the demand calculations based on new population estimates from the 2006 population census will assist in prioritising the investments in the bulk water systems and estimating the size of the required supply capacity.

The links from the investments in the existing urban and rural water systems could be based on:

- The bulk water scheme becomes relevant when the demand in the urban centres covered by the scheme exceed the existing production capacity.
- When the bulk water schemes are implemented, some components of the existing urban water schemes will be maintained in a working order e.g. the boreholes for drought management and water security while other components such as old treatment plants with high operational costs will be abandoned. In high demand areas such as Maseru the existing capacity in the newly upgraded Maseru treatment plant and the Tikoe Plant should be maintained. This implies that the investment estimates should include replacement investments for these components.
- The extension to the rural settlements covered by the scheme should be gradual over some years
- The bulk water schemes are intended to supplement the existing rural water schemes – this implies that the demand and willingness to buy water from the bulk water scheme might be slow to pick up since there will be water available from the existing schemes that is likely to be less expensive per m^3. This will affect the financial viability of the bulk water systems.

4 THE BASELINE SCENARIO

4.1 Description of the Planning Tools

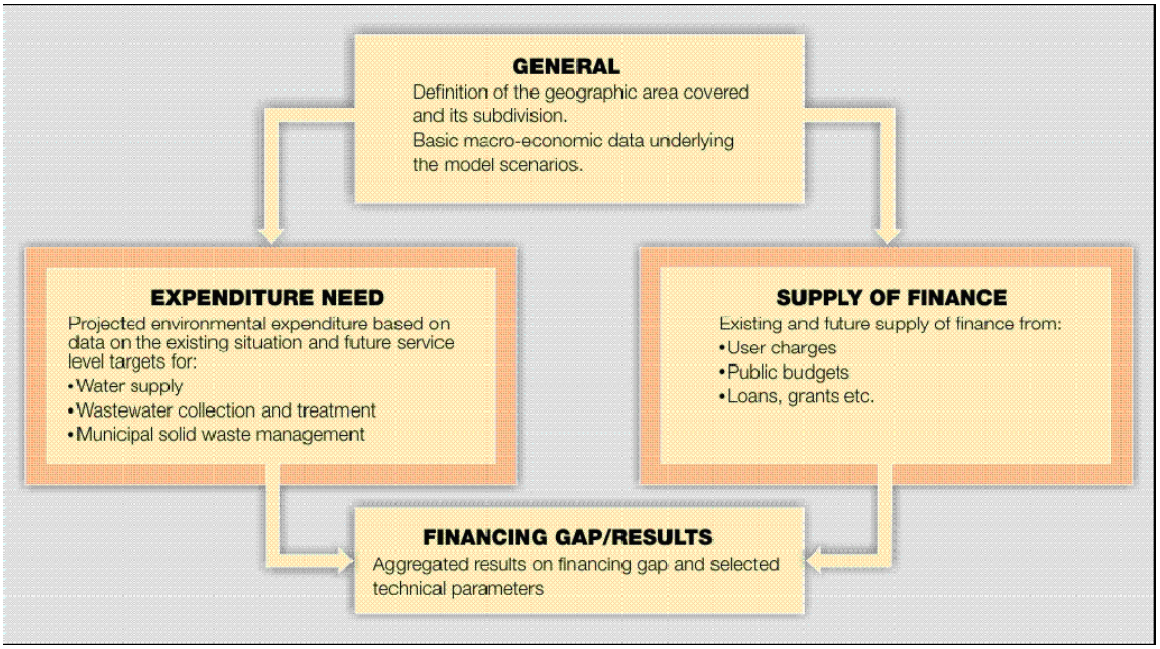
4.1.1 FEASIBLE

The FEASIBLE planning tool is a computerised decision support tool developed by OECD and Denmark. The FEASIBLE Version 2.4 enables analysis of Water supply, Wastewater collection and treatment and Municipal solid waste management.

The model is structured in four main components:

- General, which contains the definition of the geographic area covered with its subdivision into regions, municipalities and groups of municipalities and the basic macro-economic data in the model scenarios.
- Expenditure need, which calculates the projected environmental expenditure (for operation and maintenance, re-investment, renovation and new investments in environmental infrastructure) based on data on the existing situation and service level targets entered by the user.
- Supply of finance, which describes the existing and future supply of finance from user charges, public budgets, loans, grants etc.
- Financing gap/results, in which the aggregated results on financing gap and selected technical parameters are calculated.

Figure 31: Structure of FEASIBLE



In FEASIBLE, data may be entered and scenarios run at various levels.

To describe the water services in Lesotho, the data has been structured according to 'Municipalities'[21] defined as the WASA supply areas individually and for rural areas segmented into the 'accessible villages' and 'in-accessible villages' in each district

[21] Municipality denotes a geographical subsection within a region (may be individual municipalities or groups of municipalities which are categorised according to size)

The FEASIBLE can operate with planning periods of 10 or 20 years and enables the user to define and compare scenarios.

The FEASIBLE requires basic macro-economic and demographic data and forecasts in order to estimate the expenditure needs. The user is required to enter data on Population, GDP and Private consumption. The underlying calculations of the model are in international prices, and a set of price correction factors is used by FEASIBLE to convert results from international prices to local prices. The user is therefore required to enter data concerning the local expenditure of key expenditure components such as land, power, fuel, labour, equipment, building materials, etc.

FEASIBLE calculates the projected expenditure need based on data on the existing situation and targets entered by the user. FEASIBLE calculates the expenditure needs based on a number of generic expenditure functions which are incorporated into the model. These generic expenditure functions cover a number of technical development measures in each sector. This means that the existing situation and the target situation are modelled through the selection of specific technical development measures which, in turn, are believed to lead to the fulfilment of a given target.

The key parameters available to describe the service level and set targets for the water supply system are:

- Type of water intake and treatment
- Volume of water production
- Coverage of water supply (percentage of the population covered by central or local water supplies)
- Renovation of distribution network
- Renovation of service connections (the part of the network connecting each house or building - often private property)
- Renovation of intake, treatment and transmission system.

The calculations are done according to different cost functions for urban and rural technologies.

The key parameters available to describe the service level and set targets for the wastewater treatment system are:

- Wastewater collection rate (percentage of the population connected to sewer system)
- The share of the wastewater collection system to be rehabilitated (% of total)
- Renovation and upgrading of pumping stations (increasing energy efficiency)
- The share of the population connected to a wastewater treatment plant1
- Type of wastewater treatment technology

The FEASIBLE does not cover on-site disposal methods in urban areas. In the waste water calculations for Lesotho the urban areas outside Maseru are using the rural cost functions in order to best describe the type of sewerage treatment technologies used in the smaller towns.

A detailed description of the FEASIBLE tool and the cost functions is available in the extensive documentation and guidelines provided with the tool.

At this stage of preparing the draft Baseline Report, the FEASIBLE has been customised to the Lesotho water sector by defining the ‘Municipalities’, technology options and cost corrections, however the data entry of population per municipality awaits the completion of the analysis of population per rural and urban service area. The results of the FEASIBLE estimates will be available in the final Baseline Report and subsequent reports on the Financing Strategy.

4.1.2 Strategic Financial Planning Model

The Strategic Financial Planning Model (SFPM) is a tool for estimating the financing needs versus available funding in the water and sanitation services sub-sector in Lesotho for different development and policy scenarios.

The SFPM is designed to specifically describe the water sector in Lesotho and will be used at national level by the COW's office in cooperation with the sector stakeholders (WASA, DRWS and LLWSU) to guide the development of sector strategies and the preparation of MTEF budgets.

The SFPM results can via the LWSIMS (when fully operational) be used as a tool to provide the information on water sector targets and plans to all stakeholders via the internet.

Use Specification: The users of the SFPM software will primarily be planners in the Policy, Planning and Strategy Unit (PPSU) in the office of the COW in cooperation with planners in WASA, DRWS and the LLWSU that will use the SFPM based on input data from the existing systems in the 3 water sector institutions.

When the LWSIMS is fully operational the PPSU will use the SFPM based on data input from the LWSIMS and will make the resulting investment plans available to stakeholders via the LWSIMS. The use of the SFPM will continue to require close coordination between the PPSU and the 3 water sector institutions and will be a tool to enhance this coordination in a practical manner.

Input specification: The data input to the SFPM will basically be the data from:

- The DIS – the detailed bottom-up planning system for rural water and sanitation;
- The WASA Financial Model with operational and system data on water and sewerage in urban areas;
- The LLWSP design data on bulk water systems;

The existing planning tools (DIS and WASA Financial Model) are based on MS Excel and the links to SFPM is easily established. The SFPM will have facilities for general socio-economic data e.g. general population data, forecasts for economic development in Lesotho, future revenues etc. to facilitate analysis of development scenarios and policies options.

Output specification: The following standard reports are pre-programmed:

- Tables showing the total annual investment requirements, available resources and financing gap for different development scenarios and policy decisions;
- Tables showing the annual investment requirements, available resources and financing gap for different development scenarios and policy decisions for the respective sub-sectors individually;
- Graphs showing the total annual investment requirements, available resources and financing gap for different development scenarios and policy decisions;
- Graphs showing the annual investment requirements, available resources and financing gap for different development scenarios and policy decisions for the respective sub-sectors individually;
- In the future when the LWSIMS including the GIS is fully operational the SFPM results that can be geo-referenced shall be shown on Maps.

The SFPM shall be easily manipulated by users to produce any special reports that might be required.

Quality control specification: The SFPM shall as a minimum automatically indicate errors for data entry mistakes/ inconsistencies. All cells containing formulas shall be locked to prevent data entry mistakes.

Operational specification: the SFPM is available in two formats:

Version A: SFPM (2035) is available in 2 formats:

- A: the tool for general use – containing one sheet for entry of key variables and presentation of key results
- B: complete model with access to all data and technical variables - only for use by the TWG or other persons familiar with the SFPM after training

The SFPM has the following features:

- The SFPM is designed in MS Excel and the data input sheets can receive data automatically from the sub-sector systems in DRWS, WASA and LLWSU;
- The SFPM is designed in a manner that allows for linking to a GIS system for the parts of the results that can be geo-referenced e.g. to districts or towns;
- The SFPM is programmed with appropriate security features and passwords to ensure that users do not by mistake change formulas;
- The users in the PPSU shall ensure back-up procedures.

Figure 32: SFPM Entry of Variables

Targets			Min. Coverage Targets		
Rural Water Services		Present	**2015**	**2020**	**2035**
Targets for minimum coverage			75%	100%	100%
Resulting average national coverage		63%	77%	82%	100%
Average lifespan of facilities	25	years			
Target for Replacement Investments		100%	100%	100%	100%
Capacity Building/support as % of hardware investments		2.4%	10%	7%	5%
Functionality		82%	89%	95%	95%
Government subsidy for rural O&M (free basic water)		19%	50%	50%	50%
Options for 'Equity Rules':					
1. high coverage CCs retain coverage and low coverage CCs aim for the minimum coverage target					1
2. all CCs aim for minimum coverage targets implying no investments in new coverage in high coverage CCs					0

Entry of key variables takes place in a format illustrated in Figure 32.

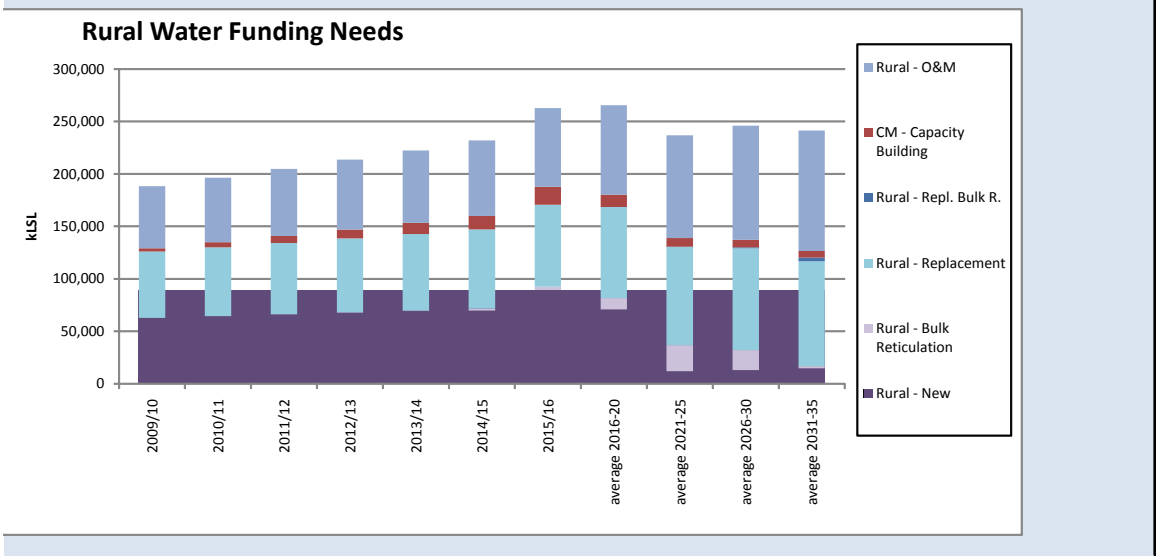
The light green colour identifies the cells that are open for data entry. Targets are set for three targets years: 2015 to represent the MDGs; 2020 to represent the Government's Vision 2020 and 2035 as the end of the planning period.

The outputs are provided in tables and graphs as illustrated in Figure 33.

The operations of the SFPM will be described in detail in the 'User Guidelines'

Figure 33: SFPM Output Tables and Graphs

Water Services Funding Needs (kLSL)	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	average 2016-20	average 2021-25	average 2026-30	average 2031-35	Total 2010-35
Rural - New	62,796	64,434	66,018	67,654	69,289	69,855	89,553	70,835	11,996	12,979	14,612	**978,910**
Rural - Bulk Reticulation	0	0	106	326	332	1,816	2,977	10,961	24,761	19,204	2,123	**290,803**
Rural - Replacement	63,372	65,717	68,108	70,547	73,035	75,568	78,212	86,636	93,882	97,025	99,899	**2,318,398**
Rural - Repl. Bulk R.	0	0	0	0	0	0	0	0	31	793	3,721	**22,724**
CM - Capacity Building	2,986	4,736	6,593	8,566	10,636	12,851	17,074	11,790	8,276	7,367	6,018	**227,708**
Total Investment	**129,155**	**134,887**	**140,825**	**147,092**	**153,293**	**160,090**	**187,817**	**180,222**	**138,946**	**137,368**	**126,372**	**3,838,543**
Rural - O&M	59,142	61,509	63,969	66,530	69,201	71,953	75,028	85,257	97,904	108,632	114,947	**2,441,890**
Total	**188,296**	**196,396**	**204,794**	**213,623**	**222,493**	**232,043**	**262,845**	**265,480**	**236,850**	**245,999**	**241,319**	**6,280,433**



Specifications on requirements for extensions: The overall set-up of the SFPM is programmed in manner that the tool can be modified to include additional modules on other aspects of the water sector (e.g. other sub-sectors to describe the IWRM scope of planning) and additional features can be added without major changes to the original programming.

Capacity building specification: The SFPM shall be accompanied with the following capacity building outputs:

– Training of the TWG members as the initial users of the SFPM in the design and operations of the SFPM;

– User Guidelines that describe the use and rational for the SFPM for future users of the system, especially new staff in the PPSU.

Maintenance Specification: The SFPM programmer shall be responsible for providing maintenance services for the first 3 years divided into:

– Fault finding and correction of faults: responsibility of the programmer and the cost shall be included as after sales service in contract for developing the SFPM;

– Assistance on demand to assist in correcting operating and data mistakes – not the programmer's responsibility – cost charged at hourly rates to be agreed.

At this stage of preparing the Baseline Report, the SFPM is available in a preliminary version that provides the estimates for the baseline scenario.

4.2 Financing Needs to Reach Targets

The results presented below are preliminary estimates based on incomplete population data and should therefore at this stage only be taken as an illustration of the type of outputs and

analysis that is possible in the SFPM. The estimates using the FEASIBLE model will be presented in the Strategic Financial Planning Report.

The results are presented for the following sub-sectors: Rural Water; Urban Water; Urban Sewerage; Bulk Water Supply; Sanitation; and Sector Coordination and Management.

The baseline targets are based on the present targets in the sector: 75% coverage by 2015 (MDGs) and 100% coverage by 2020 (Vision 2020) for both rural and urban water and sanitation

4.2.1 Rural Water

Figure 34 : Rural Water Input Variables

Targets			Min. Coverage Targets		
Rural Water Services		Present	**2015**	**2020**	**2035**
Targets for minimum coverage			75%	100%	100%
Resulting average national coverage		67%	86%	100%	100%
Average lifespan of facilities	25	years			
Target for Replacement Investments		100%	100%	100%	100%
Capacity Building/support as % of hardware investments		2.4%	10%	7%	5%
Functionality		81%	87%	95%	94%
Government subsidy for rural O&M (free basic water)		19%	50%	50%	50%

The input variables for rural water are shown on Figure 34.

All calculations in the rural SFMP are done per CC and the targets are entered for minimum coverage. Some CCs have already coverage above the 75% coverage target in 2015 and therefore the resulting coverage can be higher than the target value. The actual values might be different when the improved population data per village are available.

The targets for replacement investments are set at 100% since this is already the practice in DRWS as the investments over the last years have contained a large proportion of piped water systems in villages in the lowlands previously served by hand pumps.

The capacity building as proportion of the investments in infrastructure is presently approximately 2.4% based on an analysis of the DRWS project cycle activities and the time use and transport by the Project Officers and Village Affairs Officers. In light of the low functionality rate of 81% and the need to capacitate the new local authorities as well as the community leaders in management and O&M of the water systems, the target for capacity building has been set to gradually increase to 10% in 2015 and thereafter, when the local government capacities are assumed to have been established, gradually reduce to 5% in 2035.

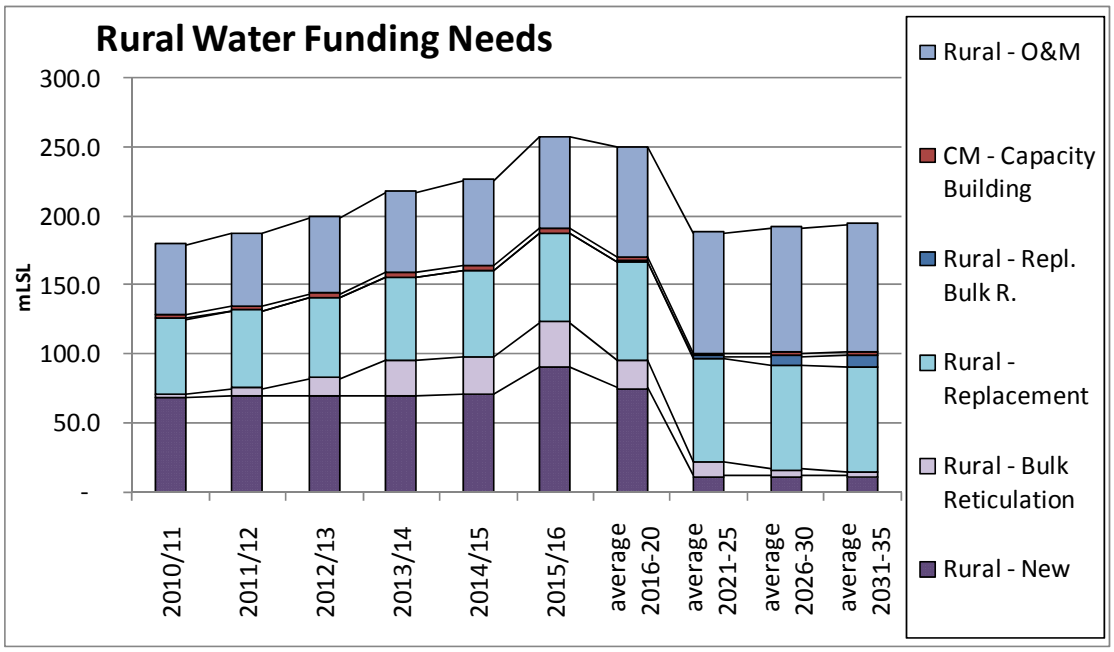
The calculations of the O&M costs are based on an estimate of the total O&M cost for the water supplies. Presently the GOL, via the development budget and the recurrent budget for maintenance of public assets to DRWS, is providing approximately 20% of the total estimated cost of O&M of rural water systems. In light of the Government's commitment to providing free basic water to vulnerable households as specified in the Water Policy, the target for the government subsidy to O&M has been set to 50% in the estimates provided below. This targets is a variable that can be changed when a strategy for how to operationalised the 'free basic water' is available.

The preliminary estimates of the total funding needs in the rural water sector are presented in Table 15 and Figure 35. These are the total funding needs including the total O&M requirements.

Table 15: Rural water funding needs

Water Services Funding Needs (mLSL) - Scenario 1	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	average 2016-20	average 2021-25	average 2026-30	average 2031-35	**Total 2010-35**
Rural - New	68.2	69.7	69.6	70.1	70.6	90.5	75.1	11.6	11.6	11.6	**988.5**
Rural - Bulk Reticulation	3.4	5.7	13.1	25.6	27.8	32.5	20.6	9.9	4.9	2.9	**299.5**
Rural - Replacement	54.4	56.3	58.2	60.2	62.2	64.4	71.4	75.7	75.9	76.1	**1,851.8**
Rural - Repl. Bulk R.	-	-	-	-	-	-	0.0	1.4	6.7	8.9	**84.8**
CM - Capacity Building	2.9	3.0	3.1	3.3	3.3	3.8	3.3	2.0	2.0	2.0	**65.7**
Total Investment	**128.9**	**134.6**	**144.0**	**159.3**	**164.0**	**191.3**	**170.5**	**100.6**	**101.0**	**101.6**	**3,290.5**
Rural - O&M	50.7	52.9	55.3	58.2	62.1	66.3	79.5	88.0	91.2	92.5	**2,101.5**
Total	**179.6**	**187.5**	**199.3**	**217.5**	**226.0**	**257.5**	**250.0**	**188.5**	**192.3**	**194.1**	**5,392.0**

Figure 35: Rural water funding needs



The investment needs for new water systems are considerable until the target year for full coverage and should thereafter only show need for investments in extending the water services due to population growth.

The investments include the implementation of distribution systems in the rural villages envisaged to be covered by the lowlands bulk water supplies. The estimates are based on a slow rate of connections as it is assumed that the existing piped water systems will continue to operate in the villages and be supplemented by the bulk water systems to provide adequate water for the presently under-served population and to provide a higher service level with yard connections and possible use of water for productive uses.

4.2.2 Urban Water including Bulk Water Supply

Figure 36 : Urban Water Input Variables

Urban Water Services		Present	2015	2020	2035
Water Services	WASA	51%	75%	100%	100%
Average lifespan of civil works (pipelines, structures)		40	years		
Average lifespan of plant and machinery		10	years		
Average lifespan of vehicles		5	years		
WASA revenues based on:			< 2015	15>20	>2020
Annual tariff increases above inflation			0%	0%	0%
Annual Bulk Water tariff increases above inflation		6.14	0%	0%	0%
Annual Salary Increase above Inflation			5%	4%	3%
Annual increase in energy costs above inflation			10%	6%	4%
WDM measures in industry and commercial demand			0%	0%	0%
Improved Operating Efficiencies			2%	2%	2%
Targets for total UfW in year 2030	Maseru	30%	25%	25%	25%
	Other towns	35%	25%	25%	25%

The input variables for urban water are shown on Figure 36.

All calculations in the urban SFMP are done per WASA supply area and combined for the Zonal Bulk Water Schemes.

The replacement investments are calculated according to the assets values available on assets in the WASA Financial Model. These are based on adding annual investments to the previous year's assets and could be undervalued in terms of present replacement costs. WASA undertook an assets revaluation in 2006, however this did not include the networks that are a major part of the assets.

The estimates presented here are based on WASA tariffs only increasing according to inflation. The WASA tariffs are automatically increased annually according to inflation and the present agreement with GOL includes the possibility of additional tariff increases every three years. The preparation for regulation in the water sector by the proposed Electricity and Water Regulator include preparation of model for evaluation of tariffs and the SFPM should be updated to correspond to this when available

The bulk water tariffs are set at LSL 6.14 per m^3 as recommended in the LLWSP final design. This is high compared to the present WASA tariffs, however the effect is expected to gradual. Some of the main existing infrastructure such as the upgraded Maseru WTP and the new Tikoe WTP supplying the industries in Maseru and the new boreholes sources established in Maputsoe, Teyateyaneng and Roma under the 3-towns project are assumed to continue operation after the implementation of the bulk water schemes.

These estimates are based on an implementation schedule for the bulk water schemes where a zonal scheme is assumed to be implemented when the demand in a town served by the scheme exceeds the existing production capacity in that town. The Metolong Project for Zone 4&5 is taken as fait accompli since the project is already in an advanced stage preparing for implementation. The sale of bulk water to the WASA areas is expected to increase gradually as the demand in the towns grows.

The operational estimates are based on that the WASA salaries continue to rise with approximately 5% above inflation decreasing to 3% as has been the case over the last 5 years, an annual increase in energy costs of 10% above inflation in view of the global trend in raising energy costs in the period until 2015. Since the energy is predominantly electricity, due to the high degree of electricity needs in Lesotho supplied through the Muela Hydro-Power station, this will need to be assessed in light of the electricity charges in Lesotho as compared to regional trends.

These baseline estimates assumes no substantial Water Demand Management measures to be implemented by the industries and no specific improvements in WASA's operational efficiencies. These aspects are technical variables in the model that can be changed for providing estimates for different scenarios.

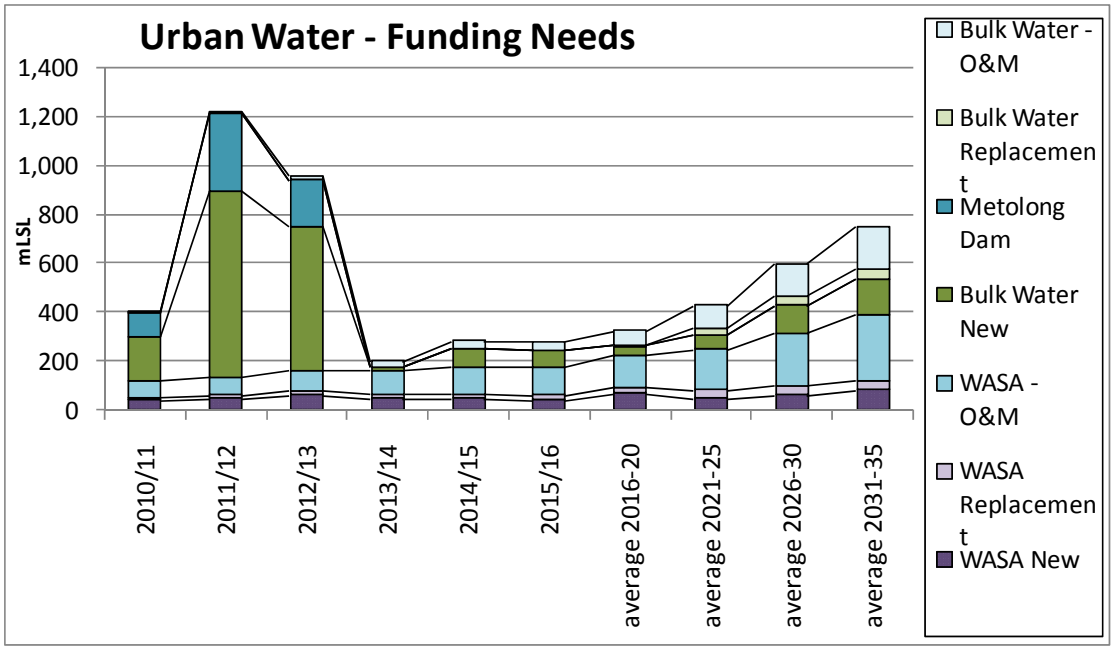
The targets for un-accounted for water (UfW) are set as improvements on the existing levels of UfW down to 25% in Maseru and in the smaller systems in light of the present efforts on rehabilitation and replacing the old pipes.

The estimates of the total funding needs in the urban water sector are presented in Table 16 and Figure 37. These are the total funding needs including the total O&M requirements.

Table 16: Urban and Bulk Water funding needs

Water Services Funding Needs (mLSL) - Scenario 1	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	average 2016-20	average 2021-25	average 2026-30	average 2031-35	Total 2010-35
WASA New	40.7	47.3	63.9	47.7	47.4	40.8	68.0	49.4	59.6	82.0	**1,582.8**
WASA Replacement	11.2	12.6	14.6	15.9	17.3	18.3	23.3	30.7	36.2	37.3	**727.1**
WASA - O&M	67.0	74.2	84.2	94.4	106.3	114.4	130.4	166.6	215.3	269.3	**4,448.6**
Bulk Water New	180.8	761.5	587.4	15.6	79.5	70.1	44.2	57.3	115.2	145.8	**3,507.8**
Metolong Dam	100.0	320.0	190.0	-	-	-	-	-	-	-	**610.0**
Bulk Water Replacement	-	-	-	-	-	-	0.7	29.6	37.5	39.0	**534.6**
Bulk Water - O&M	1.8	2.2	16.9	26.3	31.7	37.0	56.0	95.9	133.3	173.7	**2,410.3**
Total	**401.5**	**1,217.8**	**957.0**	**199.9**	**282.2**	**280.6**	**322.5**	**429.6**	**597.1**	**747.2**	**13,821.1**

Figure 37: Urban and Bulk Water funding needs



The investment needs for new water systems are dominated by the investment in the Metolong Project. The WASA investments include the extension of distribution systems and expansion of production capacities in areas not covered by the LLWSP bulk water infrastructure. In the areas covered by the LLWSP, the investments under WASA only show the investment in expansion of the distribution systems and in replacement of distribution systems and the parts of the production systems assumed to be maintained (new WTPs and borehole sources).

In accordance with discussions with the WASA management, the borehole sources are maintained due to lower productive costs (no treatment) and as a water security measure for drought mitigation.

These estimates show LLWSP investments (except the Metolong Project) considerable lower than the LLWSP design cost estimates. This is due to the lower demand predictions based on the lower population estimates and the assumption that some of the existing production capacities in the towns and rural areas will be maintained so that the capacities implemented for bulk water supply will only provide the additional demand.

4.2.3 Urban Sewerage

Figure 38 : Urban Sewerage Input Variables

Urban Sewerage Services		Present	2015	2020	2035
Domestic Sewerage Services	Maseru	2.0%	6%	10%	25%
	Other Towns	0.7%	4%	7%	15%
Min Prop of water use to effluent	Ind/ Com		50%	50%	50%
	other		50%	50%	50%
Sewerage Return Factor	Domestic	75%			
	Ind/ Com	100%			
	Other	75%			
	Septic Tanks		50%	50%	50%
	Pit latrines		25%	25%	25%
WASA revenues based on:			< 2015	15>20	>2020
Annual tariff increases above inflation			7%	2%	1%

The input variables for urban water are shown on Figure 38.

All calculations in the urban SFMP are done per WASA supply areas only as it is assumed that the sewerage systems will be used to a very small extent in the rural areas within the planning period.

There are two targets for sewerage, the coverage for domestic purposes and the proportion of the water use that is entering the sewerage systems from industrial/ commercial/ government and other users. Presently only 11% of the water sales to industries enter the WASA sewerage system and increasing this proportion will require considerable expansion of the sewerage systems in Maseru as presently planned as part of the Maseru Sanitation Projects funded by the EU.

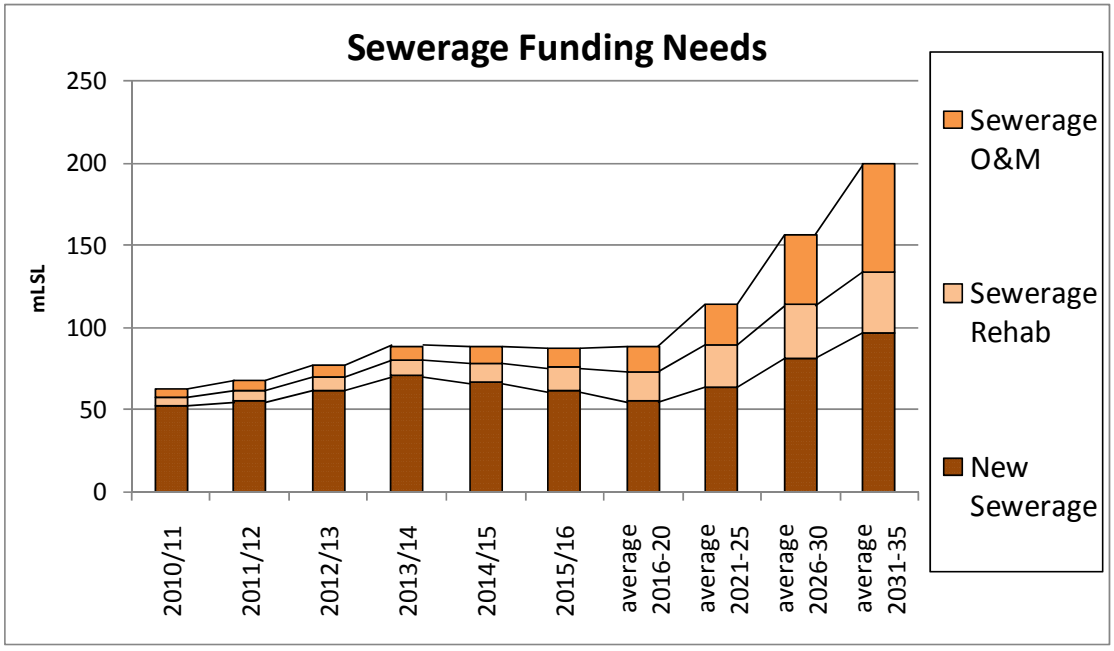
The WASA Financial Model does not provide information on separate O&M expenses for water and sewerage and therefore the costs are apportioned in proportion to the number of water and sewerage connections respectively to be able to determine the cost recovery aspects of water and sewerage services. When better data on specific operational costs for sewerage services become available, the SFPM can be improved to capture this.

The estimates of the total funding needs in the urban sewerage sub-sector are presented in Table 17 and Figure 39. These are the total funding needs including the total O&M requirements.

Table 17: Urban Sewerage funding needs

Sewerage Funding Needs (mLSL) - Scenario 1	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	average 2016-20	average 2021-25	average 2026-30	average 2031-35	Total 2010-35
New Sewerage	53.0	55.5	62.1	70.5	66.7	61.4	55.5	63.9	81.3	97.2	**1,859.1**
Sewerage Rehab	4.8	6.3	8.1	9.8	11.5	14.3	17.8	25.6	32.6	36.9	**618.7**
Sewerage O&M	4.7	5.8	7.2	8.6	10.2	11.4	14.8	25.2	42.9	65.0	**787.6**
Total	**62.5**	**67.6**	**77.4**	**88.9**	**88.4**	**87.0**	**88.1**	**114.7**	**156.8**	**199.1**	**3,265.4**

Figure 39: Urban Sewerage funding needs



The investment needs for sewerage systems are based on the capacity requirements to satisfy the demand as expressed by the coverage targets and the proportion of effluent from industries etc entering the sewerage system. There are no data available on the capacity of the existing sewerage treatment plants in the smaller towns and the preliminary estimates presented here are based on assumed capacities estimated based on the sewerage billing data in the respective towns.

This can be improved in the future estimates when better data becomes available as part of preparation of the sanitation plans for these towns.

4.2.4 Sanitation

The estimates for 'Sanitation' refer to the provision of on-site facilities for disposal of human waste. Other environmental sanitation aspects such as drainage and solid waste management are excluded as these do not fall under the responsibility of the water sector institutions.

The sanitation estimates are done for rural and urban areas respectively. In rural areas the Ministry of Health has promoted household sanitation and provided hygiene education and these activities have resulted in considerable increase in coverage. Over the last 10 years, the DRWS has increasingly been involved in sanitation activities and are supporting the implementation of household VIP latrines in villages where water systems are constructed by providing a subsidy of close to 90% of the construction cost.

In urban areas, the Urban Sanitation Improvement Team under the Ministry of Local Government has assisted households in the implementation of VIP latrines without providing a subsidy. The ongoing EU financed Maseru Waste Water Project will support the implementation of on-site sanitation facilities and provide a subsidy

The input variables for the sanitation estimates are shown on Figure 40.

Figure 40: Scenario 1 – Sanitation input variables

Rural Sanitation	Present	**2015**	**2020**	**2035**
Targets for coverage	42%	71%	100%	100%
Hygiene Education as % of hardware investments	1%	1%	1%	1%
Government subsidy for rural sanitation	90%	90%	90%	90%
Urban Sanitation	Present	**2015**	**2020**	**2035**
Targets for coverage	75%	88%	100%	100%
Hygiene Education as % of hardware investments	1%	1%	1%	1%
Government subsidy for urban sanitation	0%	0%	0%	0%

The targets in both rural and urban areas have been set at 100% by 2020 in accordance with the Vision 2020. This implies a target of 71% in 2015 for rural areas up from the present estimate of 42% and 88% for urban areas up from the present 75%.

The present activities in the water sector include a small input to hygiene education in connection with the community capacity building activities. In the estimates presented below this is estimated to continue at a level of about 1% of the hardware investment costs.

The existing coverage statistics will be improved with the analysis of the 2006 population census data and when this is available later in the 1st quarter of 2010, the SFPM will be improved based on this data.

The main driving variable for the government support to sanitation is the subsidy level. The Baseline Scenario estimates present the cost of continuing the present DRWS strategy of providing a 90% subsidy for rural sanitation and no subsidy in urban areas.

The total investments in rural sanitation including the households' own investment are shown on Table 18 and Figure 41 and the investments for urban sanitation are shown on Table 19 and Figure 42.

Table 18: Scenario 1 – Rural Sanitation Investments

Rural Sanitation Investment (mLSL) - Scenario 1	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	average 2016-20	average 2021-25	average 2026-30	average 2031-35	**Total 2010-35**
Total Sanitation Investment	59.5	60.6	61.6	62.7	63.7	78.2	63.8	6.1	6.1	6.1	**797.7**
Government Subsidy	53.6	54.5	55.5	56.4	57.3	70.4	57.4	5.5	5.5	5.5	**717.9**
Household Investments	6.0	6.1	6.2	6.3	6.4	7.8	6.4	0.6	0.6	0.6	**79.8**
Hygiene Education	0.6	0.6	0.6	0.6	0.6	0.8	0.6	0.1	0.1	0.1	**8.0**
Total Sanitation Invest.	**60.1**	**61.2**	**62.2**	**63.3**	**64.4**	**79.0**	**64.5**	**6.2**	**6.2**	**6.2**	**805.7**

Figure 41: Scenario 1 – Rural Sanitation Investments

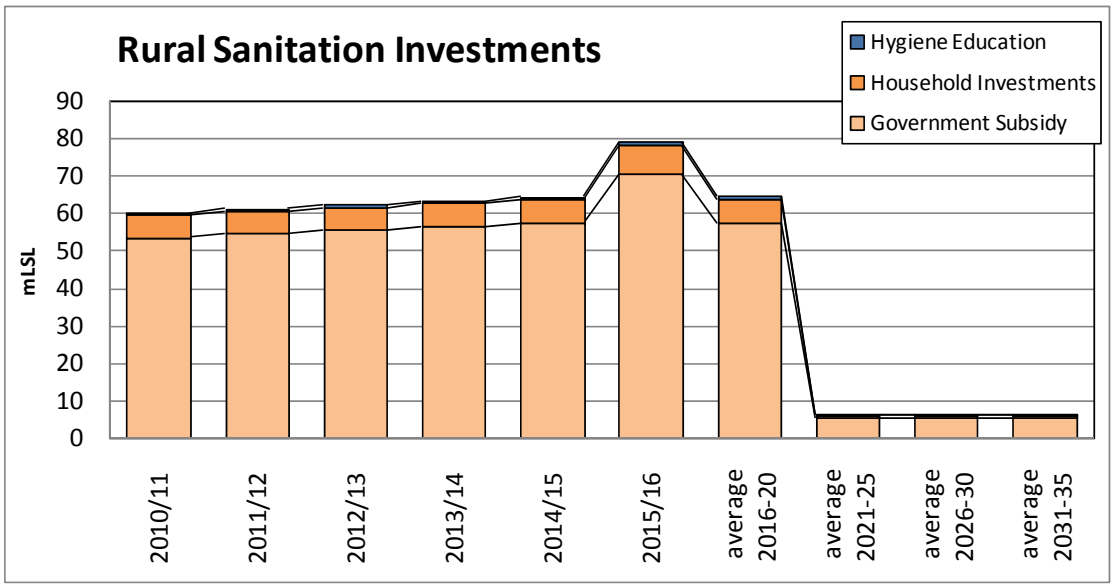
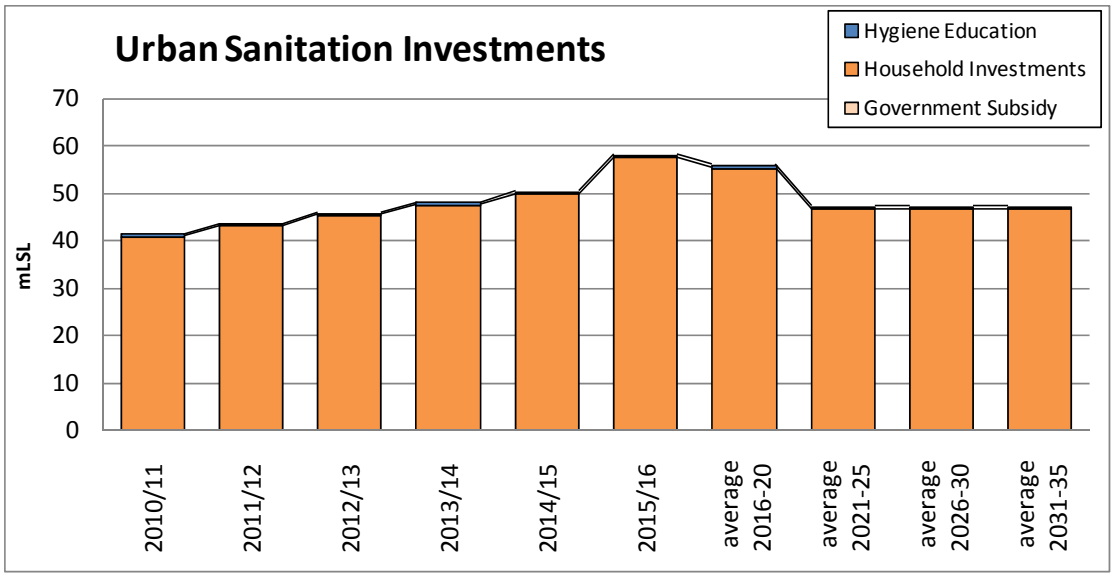


Table 19: Scenario 1 – Urban Sanitation Investments

Urban Sanitation Investment (mLSL) - Scenario 1	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	average 2016-20	average 2021-25	average 2026-30	average 2031-35	Total 2010-35
Total Sanitation Investment	40.9	43.2	45.4	47.6	49.8	57.6	55.4	46.6	46.6	46.6	**1,261.1**
Government Subsidy	-	-	-	-	-	-	-	-	-	-	**-**
Household Investments	40.9	43.2	45.4	47.6	49.8	57.6	55.4	46.6	46.6	46.6	**1,261.1**
Hygiene Education	0.4	0.4	0.5	0.5	0.5	0.6	0.6	0.5	0.5	0.5	**12.6**
Total Sanitation Invest.	**41.3**	**43.6**	**45.8**	**48.1**	**50.3**	**58.1**	**55.9**	**47.1**	**47.1**	**47.1**	**1,273.7**

Figure 42: Scenario 1 – Urban Sanitation Investments



These estimates shows that to achieve the target of full coverage by 2020 using the present strategy of subsidising 90% of the implementation cost in rural areas, the government would need to invest between mLSL 50.- and 60.- annually in sanitation.

4.2.5 Total sector financing needs

The total financing needs for the water and sanitation services are presented in Table 20 Figure 43. It must be emphasised that at this stage these estimates are preliminary and will be improved in the final baseline report as soon as the analysis of population data per service

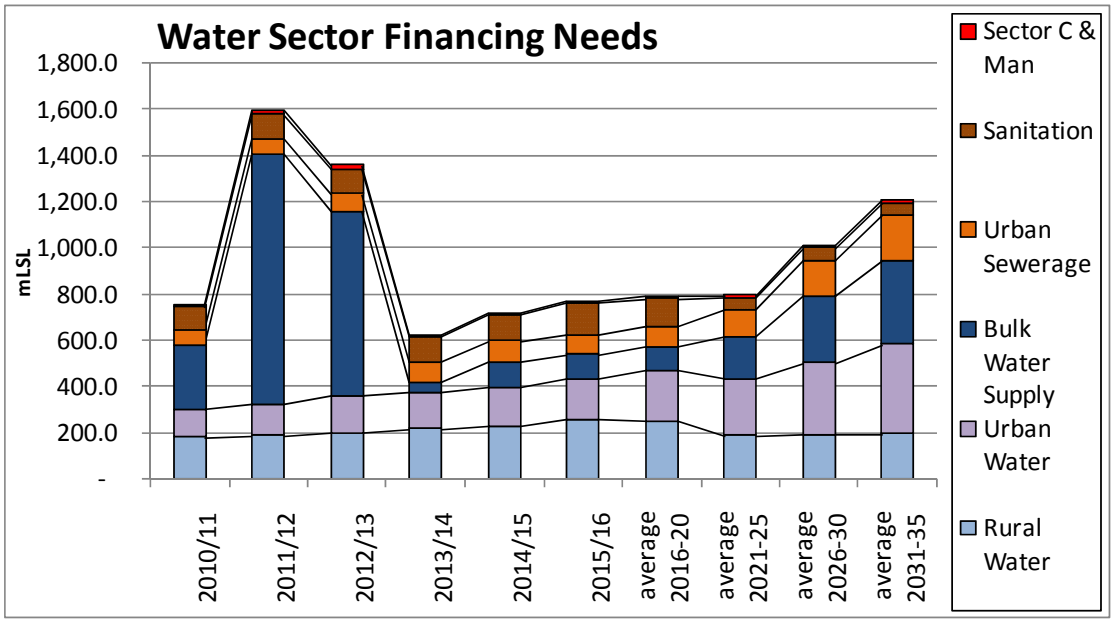
area has been completed and when data are available from the BOS on water and sanitation coverage.

An allocation has been presented in Table 20 for the funding needs for Sector Coordination and Management based on the present recurrent budgets for the office of the COW projected in proportion to the total investment needs in the sector. These estimates can also be improved when the water sector strategies give clear directions on the future activities in relation to co-ordination and management of the water services sub-sector e.g. the cost of regulation etc.

Table 20: Sector Financing Needs

Sector Financing Needs (mLSL) - Scenario 1	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	average 2016-20	average 2021-25	average 2026-30	average 2031-35	Total 2010-35
Rural Water	179.6	187.5	199.3	217.5	226.0	257.5	250.0	188.5	192.3	194.1	**5,392.0**
Urban Water	118.9	134.1	162.7	158.0	171.0	173.5	221.6	246.7	311.0	388.6	**6,758.4**
Urban Sewerage	62.5	67.6	77.4	88.9	88.4	87.0	88.1	114.7	156.8	199.1	**3,265.4**
Bulk Water Supply	282.6	1,083.7	794.3	41.9	111.3	107.1	100.9	182.9	286.1	358.5	**7,062.7**
Sanitation	101.5	104.8	108.1	111.4	114.7	137.2	120.4	53.3	53.3	53.3	**2,079.4**
Sector C & Man	8.7	18.5	15.7	7.2	8.3	8.9	9.2	9.2	11.7	14.0	**287.8**
Total	**753.7**	**1,596.1**	**1,357.4**	**624.9**	**719.7**	**771.2**	**790.3**	**795.3**	**1,011.2**	**1,207.7**	**24,845.7**

Figure 43: Sector Financing Needs



The estimates are presented as the total costs including the O&M costs in order to show the total financial flows in the sector and present not only the funding for investment requirements but also the users contributions to the sector in terms of payment of tariffs and part of the O&M costs for rural water supplies.

4.3 Available Finance

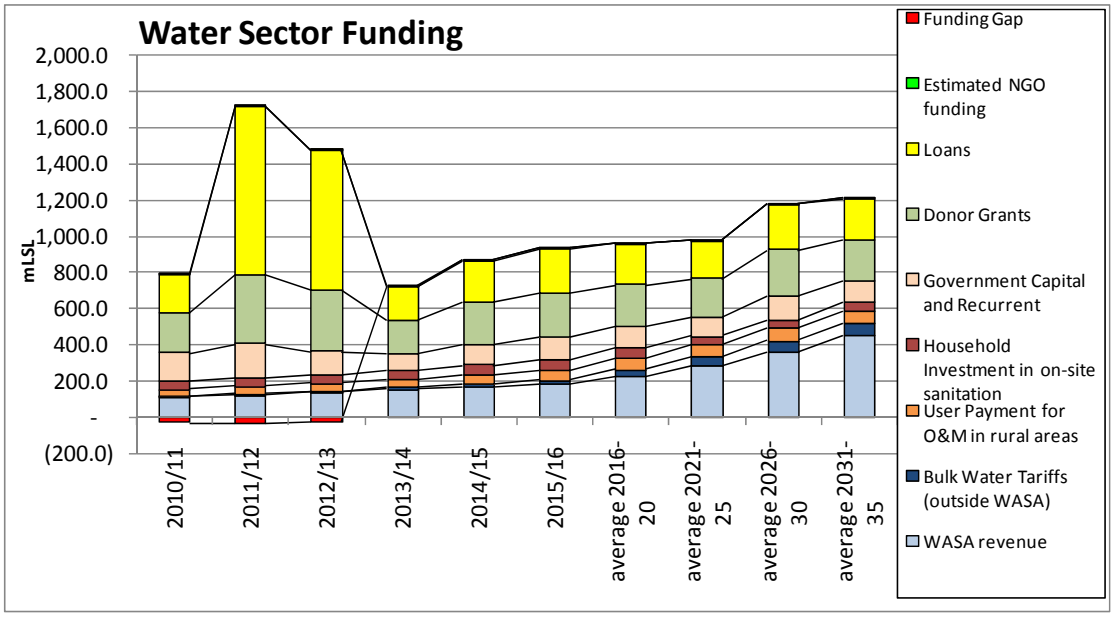
Estimates over the available funding for water services are shown in Table 21 and Figure 44: Sector Funding. The estimates show the user payment of WASA tariffs in the urban areas and preliminary estimates of the Bulk Water Charges for water supplied to rural communities as well as the payments by the rural communities for O&M costs. The government/ donor funding is according to the budgets for the current MTEF planning period. Although small, there is also some funding from different NGOs, especially to the rural water sub-sector that is not on-budget and this has been show as estimated in the DRWS DIS, assuming to increase slightly over time.

The data presented below shows that presently there is adequate funding for the sector to achieve targets, however the present level of both loan and grant funding is un-usually high due to the Metolong Project and substantial grant funding from the the Millennium Challenge Corporation for the water sector.

Table 21: Sector Funding

Total Sector Funding (mLSL) - Scenario 1	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	average 2016-20	average 2021-25	average 2026-30	average 2031-35	**Total 2010-35**
WASA revenue	114.8	126.6	139.5	153.7	169.2	182.4	223.2	283.3	363.1	455.2	**7,510.0**
Bulk Water Tariffs (outside WASA)	1.2	2.3	5.1	10.4	16.2	23.0	39.0	49.7	58.7	61.3	**1,101.6**
User Payment for O&M in rural areas	39.2	40.9	42.7	44.9	47.8	51.0	61.2	67.7	70.3	71.2	**1,618.7**
Household Investment in on-site sanitation	46.9	49.2	51.5	53.9	56.2	65.4	61.8	47.3	47.3	47.3	**1,340.9**
Government Capital and Recurrent	156.4	188.2	125.8	92.3	115.7	122.7	115.9	106.6	128.7	115.6	**3,135.1**
Donor Grants	219.0	383.2	341.1	184.6	231.4	245.3	231.8	213.2	257.3	231.3	**6,272.6**
Loans	214.4	930.1	772.6	184.6	231.4	245.3	231.8	213.2	257.3	231.3	**7,246.4**
LG Funding	1.1	1.1	1.2	1.2	1.3	1.3	1.6	2.0	2.5	3.2	**53.6**
Estimated NGO funding	1.0	1.0	1.1	1.1	1.1	1.1	1.2	1.3	1.5	1.6	**34.3**
Total Sector Funding	**793.9**	**1,722.7**	**1,480.6**	**726.7**	**870.4**	**937.5**	**967.3**	**984.4**	**1,186.5**	**1,218.1**	**28,313.3**
Sector Financing Needs	753.7	1,596.1	1,357.4	624.9	719.7	771.2	790.3	795.3	1,011.2	1,207.7	**24,845.7**
Loan repayment/ interst	13.5	96.2	101.8	101.8	150.7	166.3	177.0	189.1	175.3	10.4	**3,389.2**
Funding Gap	**(26.7)**	**(30.3)**	**(21.4)**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**(78.4)**

Figure 44: Sector Funding



4.4 Financing Gap and possible Policy Measures to Bridge the Gap

The estimates above show that substantial public funding (government, donor grants and loans) are needed to achieve the 2020 targets of full coverage. The measures that could be considered to achieve this:

- Adjusting the WASA tariffs to provide full cost recovery for urban water services – adjustment of the WASA tariffs especially needed if the higher tariff for bulk water supplies is maintained. This needs to be analysed in light of the willingness to pay and affordability studies.

- Improve the operating efficiencies of the urban water services by investing more aggressively in replacement of old pumps, reducing the UfW and use of efficiency measures such as pre-paid metering
- The level of government/ donor funding should be further discussed. The government predicts considerable increases in the GDP and this should make more funding available from the government revenues to water sector improvements. On the other hand, presently the water services are allocated close to 20% of the government's capital budget and this is probably more that what can be expected in the longer term when the investments in the Metolong Dam and WTP is completed. (implementation of water storage infrastructure such as the Metolong Dam is presently not included in the SFPM).
- The prospects for private investments in the water sector in Lesotho beyond the investments in self-supply (that to some degree is overlapping with the public water supplies) could be considered. Areas of relevance could be for productive uses in areas outside the areas supplied by the bulk water schemes. However presently the scope does not seem very significant compared to the overall sector funding requirements.

The analysis in both the SFPM and the FEASIBLE will be further refined and prepared for the different development scenarios to illustrate the possible ways the water services sector can develop.

5 AFFORDABILITY ANALYSIS

5.1 Existing Affordability Studies

5.1.1 Introduction

The purpose of this chapter is to evaluate the outcome of the existing studies on Willingness to Pay (WTP) and Affordability to Pay (ATP) for water and sanitation services to determine the need for additional information that might be needed in the study on 'Strengthening capacity in strategic financial planning for the water supply and sanitation sector in Lesotho'

5.1.2 The relevance of WAP analysis in the current study

The objectives of the WTP study are to assess the demand for the Water Supply and Sanitation (WSS) services, consumers' awareness of the services and how much they would be willing to pay for the services. The WTP studies are also aimed at providing information on the factors that influence consumers WTP and their attitudes towards paying for WSS services. Information from WTP studies give some indication on whether the amount consumers are willing to pay will be enough to sustain the provision of WSS services. The objective of the ATP study is to determine if the WTP is feasible, i.e., is it possible for the consumers to afford the amount given their social and economic conditions.

Indicating the WTP amount is critically important for decision makers to determine if the set tariffs are feasible or whether they need to be reviewed. Stating the amount is also useful for policy and planning purposes as it makes it relatively easier for government to know which and by how much consumers can be subsidized, where necessary.

After establishing this, it is important to assess whether the consumers economic conditions will allow them to pay the amounts they are willing to pay, hence the affordability study.

The existing WAP studies were reviewed with these objectives in mind. Specifically, to assess if the existing studies quantified the WTP by consumers, quantified the consumers ability to pay, identified options to be used in ensuring sustainable provision of safe water to all households

5.1.3 Existing WAP studies

Studies on the willingness and affordability to pay for water and sanitation services in Lesotho have been carried out over the past 12 years (1996-2008)[22]. All the existing studies involved detailed surveys that examined, among other things, willingness and ability to pay by connected (WASA customers) and unconnected households, households awareness of WSS services, attitudes, socio-economic conditions including poverty patterns, wealth status (in terms of assets ownership) and income levels.

The studies cover both the urban and rural areas in the lowlands of the country as illustrated on Figure 45. Table 22 gives a list of these studies and the type of information collected by each.

[22] Based on substantive analysis in the LLWSP Feasibility Study and Design period by Parkman/ Sechaba Consultants

Figure 45: Areas where WAP studies were done in Lesotho

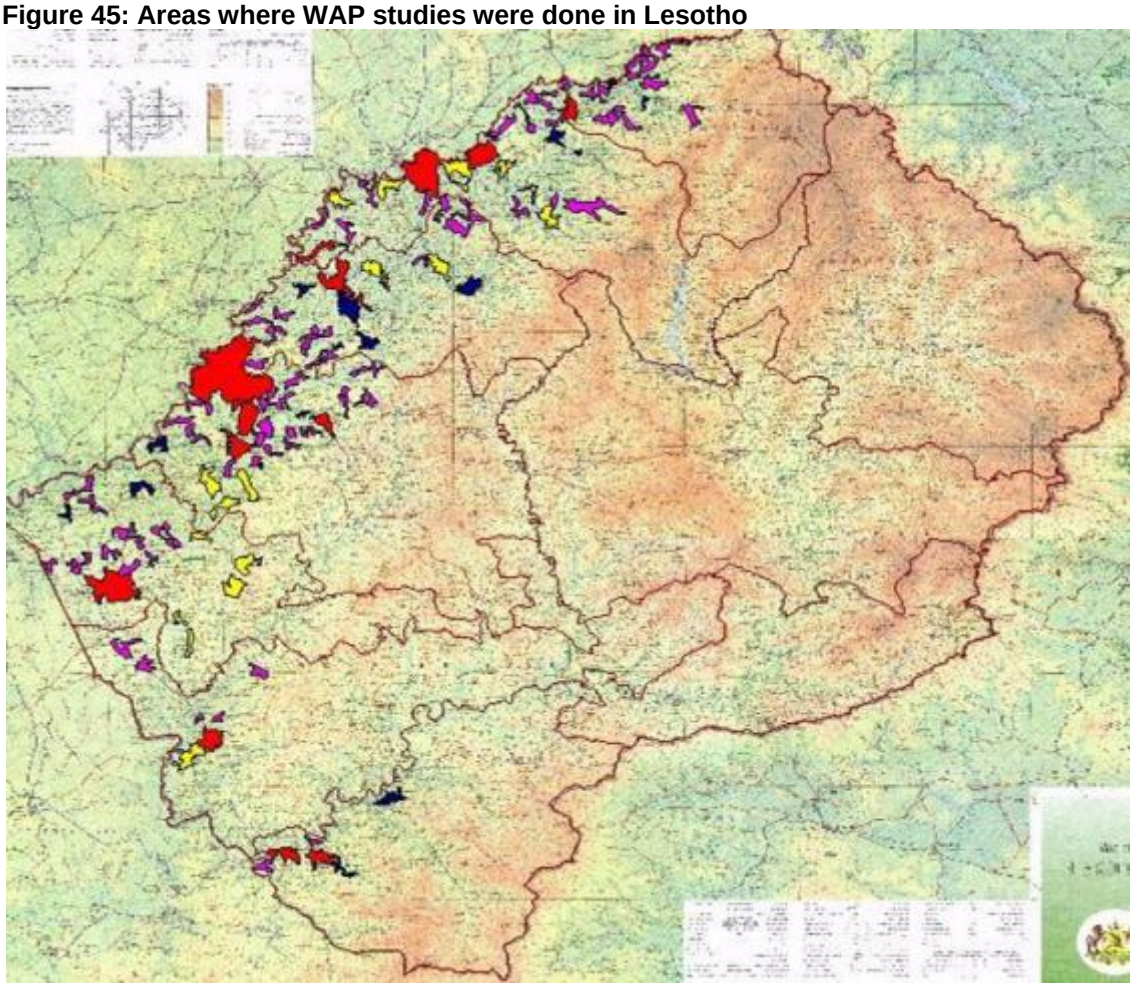


Table 22: Existing WAP Studies

	URBAN WAP STUDIES			RURAL WAP STUDIES		PERI-URBAN & RURAL AREAS
	1. Peri-urban areas in Maseru, Maputsoe & Mohale's Hoek: 1996	**2. Peri-urban areas in Maseru, Mafeteng, Mazenod and Teyateyaneg: 2002**	**3. Peri-urban areas of Maseru: 2006**	**4. Rural areas in Leribe District: 1997**	**5. Rural areas in Mt Moorosi: 2006**	**6. Peri-urban and rural areas in the lowlands: 2008**
Project type:	The study was commissioned by WASA to find out, among other things, sources of supply of water to different households and their willingness and ability to pay	Lesotho Water Sector Improvement Project: Willingness and ability to pay for urban water supply – an assessment of connected and unconnected households in Maseru with, among other things, the objective of providing information for tariff revisions	Maseru wastewater supply project – WASA project on WAP issues as part of studies of urban sanitation upgrading scheme conducted across three catchments without sewage services. Other studies comprised tariff study, institutional assessment and environmental assessment	Department of Rural Water supply: Introduction of private connections & study aimed at determining their feasibility with respect to WTP and ATP	Department of Rural Water Supply: Design for new water supply system in Mt Moorosi	Lesotho lowlands bulk water supply scheme: Social impact assessment. Other studies comprised tariff study, institutional assessment and environmental assessment
Methods used:	Surveys	Surveys: quantitative and qualitative (using focus group discussions)	Surveys	Surveys	Surveys and desktop reviews	Surveys and desk-top reviews
Information collected:	Water supply types, Willingness and ability to pay, factors influencing consumers' WTP (e.g. water supply reliability)	Water supply types, consumption patterns and price, water use constraints, user preferences, WTP & ATP by WASA (connected) and unconnected households	WTP and ATP for sanitation services, Income levels, factors influencing demand for sanitation services, awareness of sanitation services	WTP for water and connections, ATP, income levels	WTP for water and connections, proportion of the population with ATP, employment level, assets ownership,	**Surveys:** WTP for water & connections, ATP, attitudes, income levels, wealth in the form of assets **Desk top reviews**: socio economic characteristics including poverty patterns among consumers

5.1.4 Details of existing studies

Hall (2008) gives a good summary of previous Willingness and Ability to Pay for water undertaken in Lesotho over a period of about 12 years (1996-2008). These studies all involved detailed households surveys that examined the attitudes and socio-economic situation of 'connected' and 'unconnected' households (i.e. of existing and potential customers). Although the surveys were done for different utilities (water, sanitation, telecommunications, electricity), they all share in common the objective of determining the willingness and ability of Lesotho's citizens to pay for utility services in both urban and rural areas. This summary is presented below as extracted from Hall (2008), starting with the urban and then the rural studies.

5.1.5 Urban WAP Surveys

1996 - Peri-Urban Areas in Maseru, Maputsoe and Mohale's Hoek

The earliest WAP in the water sector was undertaken in 1996[23]. Just over 800 households living in peri-urban areas of Maseru, Maputsoe and Mohale's Hoek were surveyed. It was found that almost all were using improved water sources. Almost half were buying water from residents who had a WASA supply or had installed their own private systems (mainly boreholes with hand pumps). The remainder were using public standpipes or (in less than 10% of cases) public hand pumps installed by DRWS. Amongst the stated needs, reliability was the highest priority, followed by the need for a closer sources and less queuing.

The survey found that up to 90% of all peri-urban households *without water on site* would be able to pay the current market rates for water. In 1995, these households were paying, on average, M10 per month (about M19 at 2006 prices). 92% of respondents accepted that water must be paid for if services are to be expanded and improved. Price was one factor constraining use, which averaged 15.3 litres per person per day.

Over one third of the peri-urban population was supplied by existing private water vendors. However, charges were lower than expected. Although some people were paying M1 per bucket (close to M2 in 2006 prices), the majority were paying less than a quarter of this amount. Levels of satisfaction with the existing situation were found to be relatively high, although there are problems with queues and unreliability of the service.

Levels of consumption depended on the levels of service and prices. In turn, willingness to pay often depended on the level of service. Market forces were keeping prices down to about M10 per month or M0.01 per litre (about M20 or M0.02 in 2006 prices). *In short, willingness to pay was found to be closely associated with levels of satisfaction. Respondents were willing to pay more if services could be improved, with particular reference to improved reliability. The majority of the population was able to pay for water even with an increase in WASA tariffs while keeping within 5% of their income.*

2002 – Peri-Urban areas in Maseru, Mafeteng, Mazenod and Teyateyaneng

The 1996 study was substantially updated in 2002[24]. The focus was again on Maseru and three urban areas. Although it is six years since it was completed the basic finding remain applicable and are presented in some detail.

Background: This study fell under the broad umbrella of the World Bank-financed Water Sector Improvement Project. The Project was intended to assist the Government of Lesotho to improve the provision of sustainable water supply and sanitation services. It found that, since 1995, there had been significant changes in the urban areas of Lesotho, the most notable being rapid in-migration into Maseru fuelled by the new garment factories. Since the previous studies, tariffs had been increased for those with private connections, with those who consume the most water paying higher

[23] Sechaba Consultants, *Public water supply in peri-urban Lesotho: current use, future expectations, ability and willingness to pay.* For the World Bank and WASA, Maseru, 1995.

[24] *Lesotho Water Sector Improvement Project, Willingness and Ability to Pay for Urban Water Supply: An Assessment of Connected and Unconnected Households in Maseru, Lesotho, Sechaba Consultants for the World Bank and WASA, 2003*

tariffs. Meanwhile, in the peri-urban areas of Maseru, efforts had been made to introduce a limited number of water-vending kiosks and shared water points to replace free public standpipes.

The new study was commissioned to:

(a) provide information for tariff revisions, including impacts on the poor;
(b) assess changes in the extent and nature of water supply;
(c) establish the informal price of water and who is, and who is not, paying;
(d) determine how access the poor could access water without other income groups drawing freely.

Both quantitative and qualitative methods were employed to conduct the research. In Maseru quantitative interviews were held with nearly 1,000 household, including both those with WASA private connections and those without. On the qualitative side close to 100 focus group discussions and key informant interviews were conducted, focusing on 18 neighbourhoods covered in the 1996 study, including two each in Mafeteng, Mazenod and Teyateyaneng.

Supply Types: In Maseru less than half of the official urban area was found to be reticulated. The majority of the population were found to be living in the more-recently settled un-reticulated areas. Within the reticulated areas of Maseru, WASA was providing water in two main ways:

(a) through 18,000 on-site private connections provide water directly to over 100,000 people, with a further 60,000 off-site residents obtaining water through the same connections, usually through purchasing;
(b) through over 120 standpipes providing free water to the public, with the costs being charged to the Ministry of Local Government.

Outside the reticulated areas, peri-urban residents obtained water from a variety of sources, including hand pumps, rainwater catchment tanks, vendors, DRWS taps and springs.

Consumption Patterns and Price: The amount of water consumed by those without a private connection remained fairly constant, between 1996 and 2002 at a mean of between 15 l/c/d and 16 l/c/d. Only 12% of these households used more than the 30 litres per capita per day recommended for health reasons.

The price of water for unconnected households who purchase from others also remained constant in real terms, standing at a mean of M17 per m^3 in 2002 compared to M17.1 in 1996. By 2002, WASA had a stepped tariff band, with those in the highest consumption brackets being charged more than those who consume less. In fact it was only those in the top band (consuming 23 m^3 and more per month) who paid the full cost of the water. Fewer than 10% of WASA customers fell into this band, meaning that the remainder were being subsidised.

Consumption by those WASA customers with indoor connections appeared to be in decline, with the mean dropping from 18 m^3 a month in 1996 to 15.5 in 2002. Significantly, further analysis suggested that approximately one third of those in the highest consumption brackets (generally those with indoor connections) may have been reducing water use because of the relatively high tariffs applied to the top bracket. Those in the highest consumption category are not universally well-off: a significant proportion falls into this category because they sell water to neighbours who do not have private connections. Purchase of rainwater tanks by better off households was thought to be a further factor that might have resulted in reduced consumption from WASA connections.

Constraints to Use: Those households with WASA connections were using, on average, 10 times the amount used by those without connections. This is mostly because of the convenience of having piped water on-site, but also because such water, at 2002 tariffs, was considerably cheaper than water purchased off-site by the bucket.

Public Experiences and Preferences: Analysis of the public's experiences and perceptions showed that their views are directly influenced by their current levels of service. Those living in the most poorly supplied areas were most willing to accept any improvement (e.g. hand pumps) while those who have enjoyed reasonably high levels of service (e.g. free standpipes) aspire to something better (e.g. private connections). *Demand for private connections had remained high, with the key constraints being availability (in areas where there is no reticulation) and (where there is reticulation) the upfront costs of a connection, as is the case for electricity.*

Ability to Pay – WASA Customers: The issue of people's ability to pay was explored in great detail, being of primary concern to WASA and other stakeholders. Although surveys provided evidence that ability to pay was generally highest in urban areas, at the same time, the studies noted that approximately one-quarter of the urban population were extremely poor. Almost half the urban households do not have a regular wage earner, and about two-thirds do not have bank accounts, making it difficult for them to maintain an even cash flow through the month. The lack of bank accounts and ready cash has implications for the type of payments systems that might be put in place. *As will be seen in the next review, this was still the case in 2006.*

In 2002, payments by WASA customers ranged from an average of M7 per month, for those in the lowest tariff band, to M201 for those in the highest. For privately connected households in the lowest band, the cost of travelling from their homes to WASA's downtown payment centres was likely to exceed the cost of their monthly water bill. Those in the lowest band were paying only about one-third of the amount that unconnected households in the peri-urban areas pay to purchase water from others (only a monthly basis).

An analysis of payments in relation to income showed that a household with one minimum salary of about M500 per month would be able to afford a water bill of around M25 per month, without exceeding 5% of income (83% of WASA customers interviewed said they had household incomes in excess of M500 per month). Nearly 60% of households in the lowest tariff band earn over M1,000 per month, meaning they could afford up to M50 per month. *The study found that, on the whole, the system of stepped tariffs appeared to be correctly targeting those who could afford to pay more and that there was some room for tariff increases.* However, at the same time it stressed that there are limits with regard to tariff increases.

The study found clear indications that some customers in the top consumption band were feeling 'squeezed' by the actual amounts they have to pay, even if these are often well below 5% of their income. It noted that it would be unwise to put further pressure on the top tariff band, as they would be quite likely to reduce consumption or invest in alternative supplies (such as water tanks). The study noted that, as this was the only band of customers that were paying the full cost of water it would be financially unwise for WASA to reduce the number in the band by further tariff increases.

Ability to Pay – Unconnected Households: In 2002, just over half of the unconnected households in peri-urban Maseru (51%) were paying for their water, and were doing so *at rates far in excess of those charged by WASA* (the median being around M13 per month, twice as high as the lowest band of WASA private connection customers).

The report showed that a very large proportion of non-connected households (96%) would be able to pay WASA rates in the lowest consumption band, and 77% could afford the costs of the second band. However, this ability to pay rapidly diminished with regard to the third band of WASA tariffs (24%), and was virtually insignificant in the top band (0.2%). As this top band is the only one where WASA is able to recover the full costs of water supply this finding has important implications for future expansion of the network.

In other words, it was shown that if WASA extended the reticulated network and started selling water directly to those who currently buy from other vendors this would probably *not* result in any significant augmentation of the number of people able to comfortably meet the costs of the *top* band – unless such households increased their ability to pay by becoming vendors themselves, or started to exceed the recommended 5% of total income limit.

The WAP study showed that unless some adjustments was made to securing profits from the lower three bands, any increase in the number of domestic customers in the peri-urban areas could be a financial burden to WASA. It noted that *two-thirds of the non-connected households could afford to pay three times the average amounts currently paid by WASA's lowest band.* In essence, this means they would continue to pay around M20 per month for water (the current mode) but would be able to use considerably more than is currently the case.

Ability of Unconnected Households to Pay for Connections Costs: Estimates indicated that if the full cost of a WASA private connections (all infrastructure included) were passed on to the customer this would amount to as much as M10,000 per connection (2002 prices). The study found

that an extremely small proportion of peri-urban residents were able to afford such amounts. Consequently, if the customer base is to be expanded, ways will have to be found of either:

(a) lowering the cost per connection;
(b) subsidising the costs of the infrastructure;
(c) spreading the costs of repayment over an extended period of time;
(d) a combination of all three.

The study asked how much peri-urban households afford to pay for an upfront connection and noted that one way to assess this was to look at the proportion of customers who could afford to double expenditure from the current mean of M20 per month to M40. If WASA were to take half the monthly payments as being *repayment* for the connection over a period of 10 years this would be equivalent to M2,400 (in 2002 prices), or approximately one-quarter of the real costs of the infrastructure, excluding any interest rates. On this basis, if payments were to be kept within 5% of income, about 30% of the unconnected population would be able to pay for a full private connection.

In summary the 2002 study noted that it would be feasible to increase tariffs across the three lowest tariff bands for privately-connected customers: recurrent costs were affordable by most households, and the demand for private connections was there, as long as up-front connection costs can be spread over a long repayment period. Critically it pointed out that: "Increasing tariffs among those in the three lower bands and expanding access to those able to pay for private connections are key to the expansion of the water supply network and improving WASA's revenue flow".

2006 – Maseru Wastewater Supply Project Peri-urban areas of Maseru

In 2006 closely related work was carried out for WASA on WAP issues, this time focusing on urban sanitation in parts of Maseru without a sewer network[25]. The study was conducted as one component of an investigation that also comprised a tariff study, an institutional assessment, and an environmental assessment for an urban sanitation upgrading scheme focused on poorly served neighbourhoods in Maseru. A total of 800 interviews were conducted across three catchments without sewerage services. The assessment was intended to update relevant data from the 2002 report described above. By 2006 WASA had significantly eased the upfront costs of water connections and a major expansion of the reticulation network was underway.

Key conclusions drawn from the investigation are as follows:

- Improved water and sanitation supplies remains one of the highest investment priorities for households, and willingness to pay for improved water is particularly high, with households willing to pay two to three times current amounts for more water if required.
- Between 50% and 60% have monthly income of between M750 and M5000 being sufficient to afford higher levels of service including waterborne sanitation. However, one fifth of households (20%) do not have any source of reliable cash income and will need to be targeted for special assistance.
- Some 60% of all households in the project area would be in a position to pay for varied levels of waterborne services. This is equivalent to 15,700 households.
- Demand for sanitation services is affected by various push and pull factors, with strong dissatisfaction with current systems an important push factor, and affordability and desire for improved services important pull factors. With innovative down payment options, such as the one currently practiced by WASA, coupled with cost-sharing and loan schemes, high levels of demand could be achieved for waterborne sewerage.
- For those unable to afford to waterborne sewerage, dry sanitation options are viable, of which half would be able to afford partial payment for these facilities. Full subsidies would be required to reach the poorest 20% of the Project Area population, and partial subsides or a long-term loan scheme would be required to reach the remainder.

[25] Water & Sewerage Authority, Maseru Wastewater Project – EU WF Application – Beneficiary Assessment, 2006

- Of the 15,700 able to afford waterborne sanitation, almost half would not be able to afford full indoor plumbing and its associated recurrent costs, but would be able to afford outside water closets.
- The reduced sanitation down payment levels put in place by WASA will support increased demand. If innovative schemes can be effected to protect the poor who are unable to pay the full costs of sanitation, if effective education and information campaigns can also be undertaken, and if WASA treats sanitation marketing as the sale of a 'product' to those who can afford, considerable progress can be made. This will allow WASA to meet its goals of waterborne system expansion and pro-poor sanitation system improvement.

5.1.6 Rural WAP Studies

1997 – Rural areas in Leribe District

In the mid-1990s DRWS underwent reforms that resulted in a change in it approach and operations. For the first time DRWS allowed private water connections, on condition that there was sufficient water available locally to provide household who were willing and able to pay. To estimate WAP a study was commissioned for two new projects in rural Leribe District (Linareng and Leqhutsung). From this it emerged that about one third of the households (29%) had incomes of less than M20 per member per month and were, therefore, considered to be "destitute". One fifth had between M21 and M50 per member per month, and were classified as "poor" and unable to afford any private connection. The remainder were split into "average income" (45%), with incomes ranging from M51 per member per month to M400, and "better off" (7%) with incomes above M400.

Although around half of the respondents were keen to get a private connection, and 42% indicated that they could pay M25 per month to have one, only 12% felt they could afford a connection fee of M1,500. However, when the possibility of paying M500 upfront and the remainder overtime was presented the proportion who said they were able to afford a connection rose significantly. Those unable to afford a private connection indicated they were willing to pay less for a lower level of service (public standpipes for M5 per month).

Key findings from survey are:

- the proportion of well-off homes in rural areas is small;
- low connection fees are critical if customers are to be attracted;
- the 'middle class' is prepared to pay around M25 per month for an essential service;
- people are prepared to accept lower levels of services for low prices of utilities.

2006 – Department of Rural Water Supply - Mt Moorosi

The study was designed to inform the detailed design process for a new water supply system for the area being undertaken for DRWS. It involved a study of community willingness and ability to pay for water supply at different levels of services in the town of Mt. Moorosi in southern Lesotho.

The key findings were:

- Moorosi is a growing centre, which attracts people from more remote and isolated communities. However, unemployment levels are high with only 9% of respondents having waged work and only 31% bringing regular cash to the household.
- 51% receive remittances as their only means of income and this indicates that the level of poverty prevailing in the area is high. 42% of households earn less than M300 per month.
- The ownership of assets that could be monetised to pay for water connections – such as livestock - is low, indicating that many households could have difficulties making the required payments of around M400.
- Although nearly 60% indicated that they would like a private connection the proportion able to pay for such connections and monthly costs of water bills is likely to be around 35%.
- About 50% of the population will be able to afford to pay for public standpipes, although it can be anticipated that there may be some resistance to this as there is no experience of making such payments (people would need to see a measurable improvement in the levels of public water provision to appreciate the need for payments).

- The remaining 15% of the population are unable to pay and will need to be protected through self-selecting or other measures. This decision should be the outcome of negotiations between DRWS and the Community Council.
- All the businesses would like to have their own private connections and they would be willing and able to pay for their connection fees and water usage.
- Street Vendors said that they would like to have their own stand post, which would be controlled and managed by their committee. Presently their use of public stand posts causes conflicts between them and the communities.
- Lastly all the institutions asked for their own private connections, some needing more connections than others. All of them are willing and able to pay for water.

2008 -Lesotho Lowlands Bulk Water Supply Scheme (LLBWS) – Social Impact Assessment

The scheme covered rural, peri-urban and urban areas in the Lowlands region of Lesotho. Different techniques ranging from desk top reviews, surveys to focus discussion groups were used to assess households' willingness and affordability to pay for water and sanitation services. The results revealed that willingness and affordability to pay is not a problem in urban areas where (a) incomes are higher and (b) people are accustomed to paying for water. The study estimated that between 50% and 60% of peri-urban Maseru households can afford higher levels of service, including waterborne sanitation.

In rural areas however the situation was found to be different. The household survey undertaken under this study suggested the following levels of services could be afforded by the following wealth groups in rural areas:

1. Destitute (7%) – None. Need social protection measures.
2. Poor (28%) – Shared standpipes, with payment of no more than M15/month
3. Medium (46%) – Tap in Yard connection, with payments of no more than M50/month
4. Best off (10%) – Indoor plumbing – payment between M50 and M250/month

The survey found that willingness to pay for private connections probably exceeds ability to pay. If the full benefits of the LLBWS are to be realised it important that both WASA and DRWS should limited the upfront payment requirements as far as possible and that a special rural tariff should be introduced.

5.1.7 Conclusion on existing studies

From the assessment of the existing WAP studies, a wealth of information on willingness and ability to pay already exists, especially in the lowlands, which in these studies also include parts of the Foothills and Senqu River Valley regions. This information will provide requisite input data for the current study. To complement the existing data and have information on the whole country, the WAP study have been done in the highlands in tow urban and two rural areas.

5.2 Results of WAP Studies in the Highlands

This study focused on the affordability and willingness to pay for water and sanitation services by urban and rural households in the Mountain areas. This is because extensive analysis of the same exists for the Lowlands households (see Hall, 2008). To understand the capacity of households under study to pay for water and sanitation services, it is important to understand their socio-economic characteristics, in particular, their poverty patterns. The Lesotho Household Budget Survey (HBS) of 2002/03 shows that poverty in Lesotho assumes specific spatial patterns. This is also confirmed by existing studies on poverty patterns in Lesotho[26]. The existing key differences in poverty patterns of the mountain households are discussed in the following sections. This is critically important from the point of view of ability to pay for water and sanitation services by this group of households.

[26] Examples include May, J., Roberts, B., Moqasa, G. & Wooland, I. (2002) *Poverty and Inequality in Lesotho*. CSDS Working Paper #36. http://www.nu.ac.za/csds/Publications/wp36.pdf. Retrieved 2nd Feb 2007.

5.2.1 Household monthly income

Table 23 below shows the monthly income distribution of Lesotho households by region as revealed by the 2002/03 household budget survey. From the Table about 25% of households in the rural mountain areas have no regular income compared to about 26% in the urban mountain areas. The majority of households with regular monthly income earn less than M1000.00 per month (15% and 34% in the rural and urban mountain areas, respectively). This already indicates the low capacity of mountain areas households to pay for water and sanitation services given that this is just one of the items in their consumption basket.

Table 23: Percentage distribution of households by monthly cash income and region 2002/03

Income category	Maseru urban	Other Urban	Rural Lowlands	Rural Foothill	Rural Mountain	Rural SRV	Lesotho
None	6.4	26.1	26.1	11.4	24.8	5.2	100.0
1- 999	10.8	34.0	23.6	12.5	14.6	4.6	100.0
1000 – 2999	21.3	46.1	16.1	8.1	6.3	2.1	100.0
3000+	30.3	43.2	11.5	6.5	6.0	2.5	100.0
Total	**15.0**	**37.1**	**20.7**	**10.6**	**12.8**	**3.8**	**100.0**

Source: BOS, 2002/03

5.2.2 Urban vs. Rural Poverty

While households' monthly income is a good indication of households capacity to pay for amenities, perhaps an even better measure is poverty levels/rates among households. Table 2 presents the head count, severity and incidence of poverty among Lesotho households by region. The Table makes comparison between poverty levels during the 1994/95 and 2002/03 household budget surveys.

From Table 24, it is notable that poverty levels based on the three measures used decreased from the period 1994/95 to 2002/03. Although the Mountain region is better compared to other regions in terms of poverty, there is a notable difference between rural and urban households. From Table 24 it is observed that poverty is more prevalent in the rural areas where depth, severity and head count are greatest compared to the urban areas (see Other Urban column). This confirms the above analysis that the households in the mountains region may not have adequate capacity to pay for water and sanitation services and as a result may require some form of subsidy to enable them access the said services.

Table 24: Percentage distribution of households members by incidence, depth and severity of poverty and region – 2002/03 and 1994/95

Region	Head Count		Depth		Severity	
	2002/03	1994/95	2002/03	1994/95	2002/03	1994/95
Lesotho	56.61	66.61	28.97	37.85	18.73	25.89
Maseru Urban	33.73	32.28	15.04	13.80	8.92	8.00
Other Urban	46.29	40.40	21.72	17.27	13.27	9.81
Rural Lowland	62.37	64.93	32.49	33.69	21.16	21.79
Rural Foothill	66.78	71.09	35.97	41.82	23.77	28.39
Rural Mountain	56.88	80.92	29.07	52.66	18.96	39.15
Rural S.R.V	55.50	72.67	29.33	43.35	19.52	30.72

Source: BOS, 2002/03

5.2.3 Survey results of affordability and Willingness-to-pay

The socio-economic characteristics and affordability analysis

To understand the socio-economic background of the respondents, data on their socio-economic characteristics was collected. Figure 46 and Figure 47 present information on household head and household head educational status. From the figures, the majority of households from both urban and rural areas are headed by men though in the rural areas the percentage of male headed households is relatively lower (63%) compared to urban areas (84%). In both categories of households, the household heads have basic education with 49% and 32 % of urban households having attained primary and secondary educational level, respectively. In the rural areas 43% and 26% of household heads attained primary and secondary education, respectively. A relatively smaller percentage of the households obtained high school educational level (5% in urban areas and 7% in rural areas).

Figure 46: Household Head Composition

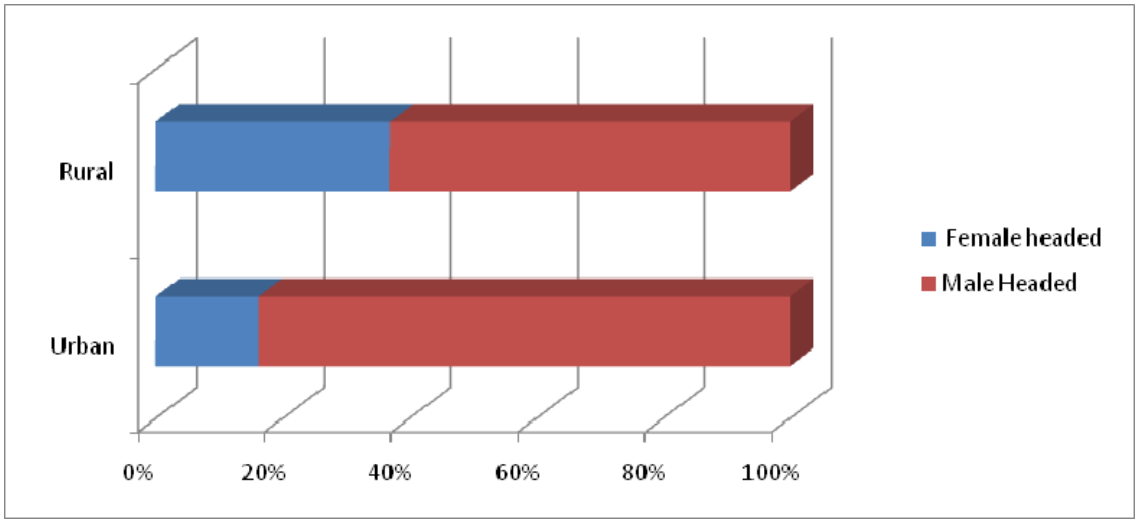
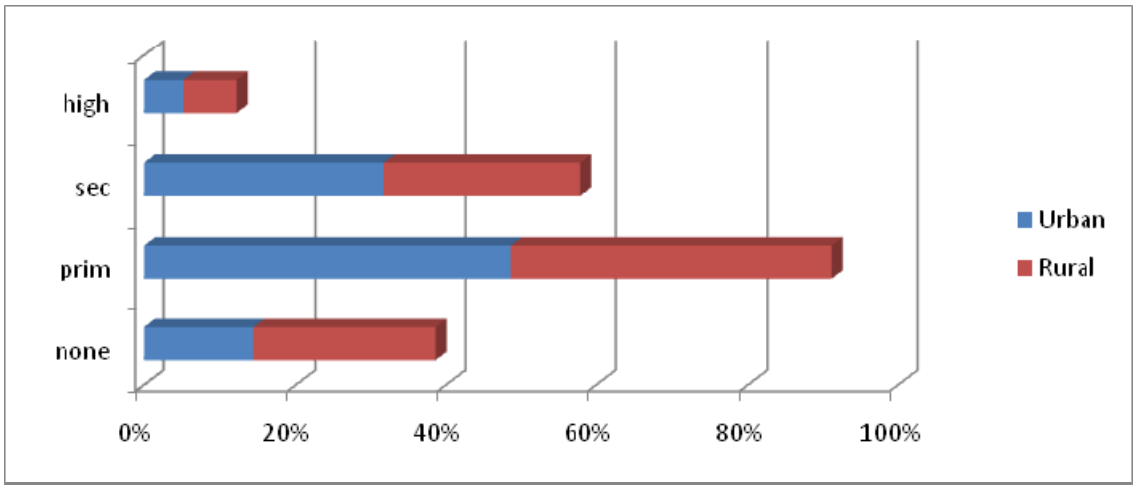


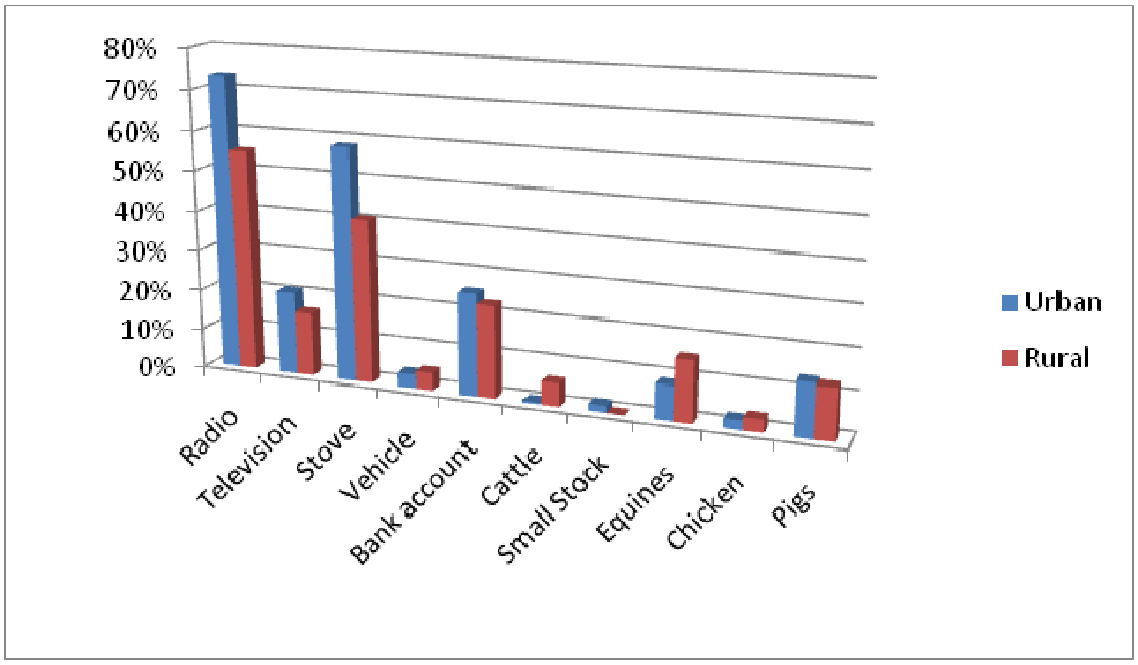
Figure 47: Educational level of Household Head



To determine the capacity of households to pay for water and sanitation services, data was collected on the number of assets that they own as well as their monthly income status. Assets are a form of wealth and matched with responses on income level, it can be easy to verify households responses (i.e. if they are true or consistent with their prevailing conditions). Figure 48 reports asset ownership of the surveyed households. From the Figure it is observed that households from both categories own more or less equal number of assets except that urban households have a relatively greater ownership of radios, televisions, stoves and vehicles while rural households relatively own

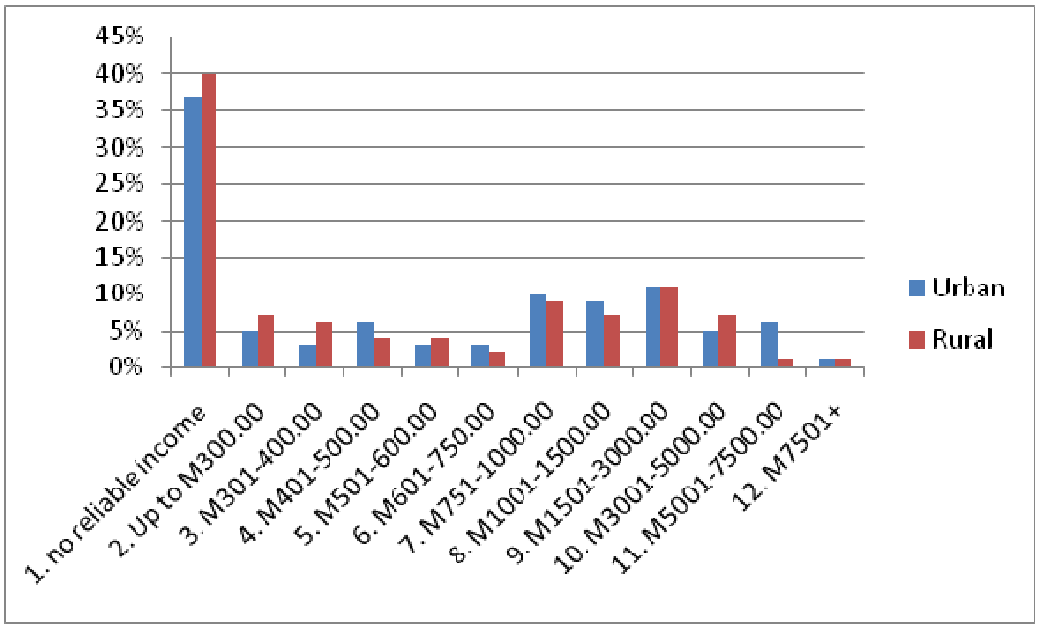
more livestock. This is not surprising given that livestock production is mainly practiced in the rural areas. Notably, a low percentage of households own assets which can be liquidated to pay for water services. Approximately 25% of households from both urban and rural households own bank account though it was not established whether such accounts are active and the amounts held in the accounts. On average less than 10% of the households own livestock. All this may indicate the low affordability of these households for payment of water services.

Figure 48: Households asset ownership



This information is compared with responses on household monthly income, reported in Figure 49 showing that the majority of households surveyed are relatively poor. About 40% of rural households and 37% of urban households do not have reliable income. Thirty one percent and 33% of urban and rural households, respectively earn below M1000.00 on monthly basis. It's only about 30% of households in both categories of households that earn above M1000.00. This analysis confirms the low capacity of the surveyed households to afford payments for water services as observed above in the households' asset analysis.

Figure 49: Households monthly income level



5.2.4 Water availability and sources

Information was also collected on the availability of portable water and its sources in the surveyed area. Table 25 gives the sources of water in both urban and rural households. Notably and shocking is the fact that a large percentage (51%) of surveyed households in the urban areas still get their water from springs and that none of the households has private water connection. The second popular source is where households buy water from neighbours that have invested in their own water supply. The data indicates that 32% of urban households rely on public standpipes. Contrarily, in the rural areas 51% of the surveyed households depend on public stand pipes, which may indicate that public stand pipes in the rural areas are either many or more reliable than those in the urban areas. Other households (31%) buy water from tankers and the rest (16%) collect water from springs. The analysis shows that a lot needs to be done in supplying water, especially to urban dwellers in the surveyed area.

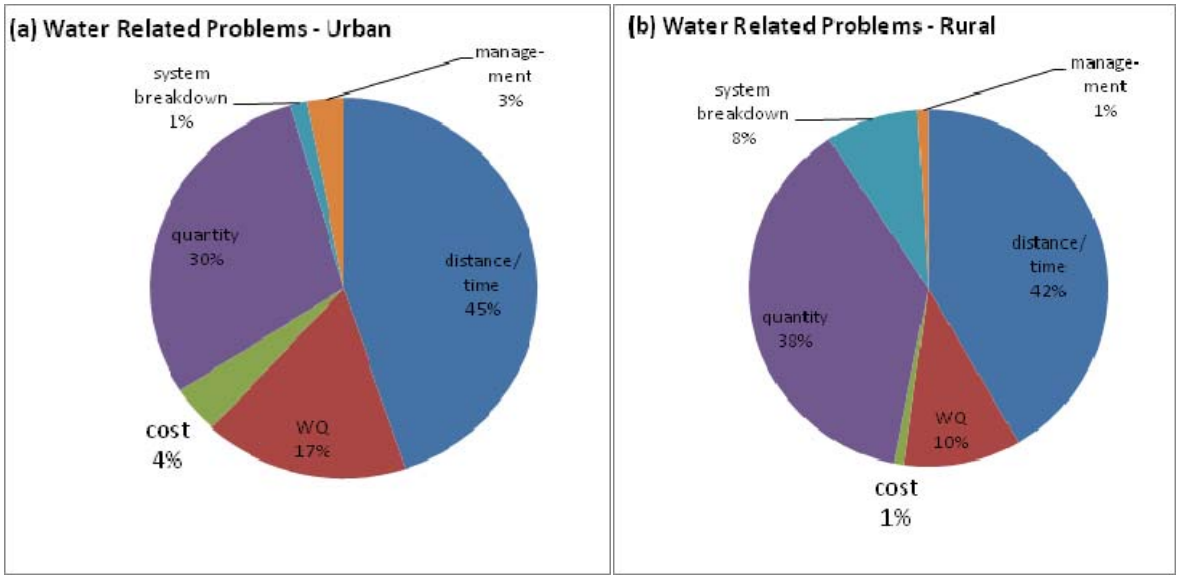
Table 25: Water Sources

	Urban	**%**		**Rural**	**%**	
Water sources	Main		Alternate	Main		Alternate
1. Public standpipe (gravity)	32	16	0	94	51	2
2. Public standpipe (pumped)	0	0	0	1	1	0
3. User group standpipe (shared bill)	0	0	0	0	0	0
4. Kiosk	0	0	0	0	0	0
5. Private connection	0	0	0	0	0	0
6. Public handpump	8	4	0	0	0	0
7. Association handpump	0	0	0	0	0	0
8. Private handpump	0	0	0	2	1	0
9. Bakkie sales	1	1	0	0	0	0
10. Tanker sales	4	2	0	57	31	14
11. Neighbors sales	45	23	0	0	0	0
11. Rainwater tank	5	3	0	0	0	0
12. Spring	99	51	4	29	16	16
13. Dam	0	0	0	1	1	0
14. River	0	0	1	0	0	5
15. Buying from market? WASA	2	1	0	0	0	0

5.2.5 Water related problems

To be able to efficiently and effectively provide water and sanitation services, it is important for the services provider to know and appreciate problems of the consumers of the services. Water related problems indicated by respondents are presented in Figure 50 while sanitation issues are presented in 0. From the Figures below, it is encouraging to see that households do not see cost as the major problem. Main water related problems are viewed as the distance between source and households and the available supply or quantity (more than 40% and 30%, respectively). This is encouraging in terms of water services payments because although the households have low capacity to pay for the services, they do not perceive cost of water services as a prohibitive factor towards accessing water.

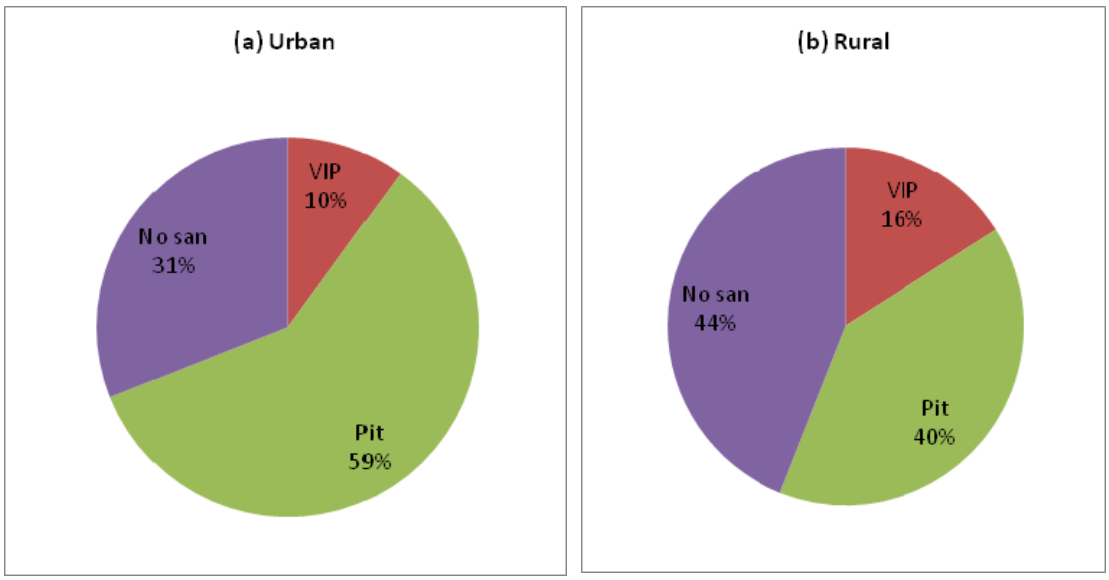
Figure 50: Water Related Problems



5.2.6 Sanitation services

Figure 51 below reports the status of sanitation services in the study areas. From the Figure it is notable that the majority of households surveyed still do not have sanitation services (31% and 44% in urban and rural areas, respectively). For those who have, the majority rely on pit latrines (59% and 40% in urban and rural areas, respectively).

Figure 51: Availability of sanitation services



Those without sanitation services use several alternative sources ranging from using neighbours' facilities (31% in urban and 20% in rural areas) to 'others' defecation in the bush or in dongas (69% in urban and 80% in rural areas).

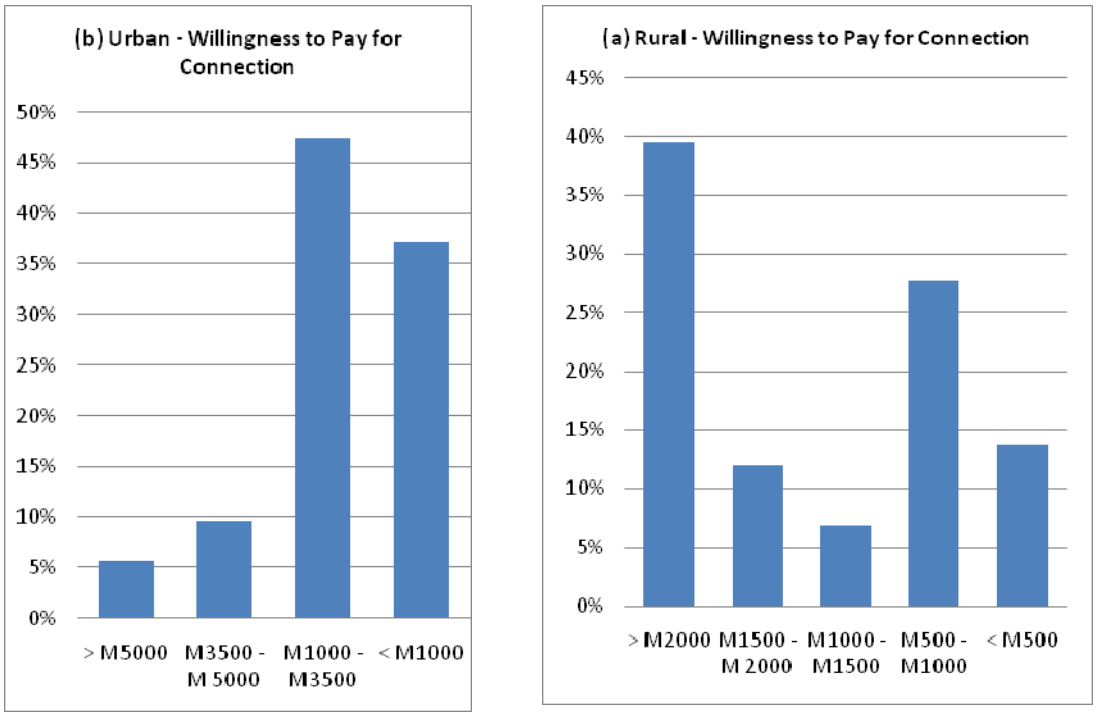
5.2.7 Willingness to pay for water connections

Despite their low capacity to pay for water connections as reflected above, all the surveyed households are willing to pay something for water connections, which indicates the high importance they attach to having portable water. Figure 52 shows the amounts that households in urban and rural areas would be willing to pay for water connections. The majority of the households would be willing to pay the amount sufficient for water connections. In the rural areas connections cost on aver-

age between M500.00 and M1000.00. About 40% of the of the rural households would be willing to pay more that M2000, 28% between M500.00 and M1,000.00 and about 20% between M1000.00 and M2000.00.

In the urban areas connections cost about M2, 000.00 on average. Again, more than 60% of the urban households would be willing to pay more than this amount. Forty eight percent would be willing to pay between M1000.00 and M3500.00, 10% between M3, 500.00 and M5, 000.00 and 5% more than M5000. Households willingness to pay indicate the fact that they appreciate that water connections come at a cost and that such cost should be borne by them. While these responses on willingness to pay to some extent contradict the analysis of affordability of water connections it indicates the value the consumers attach to portable water.

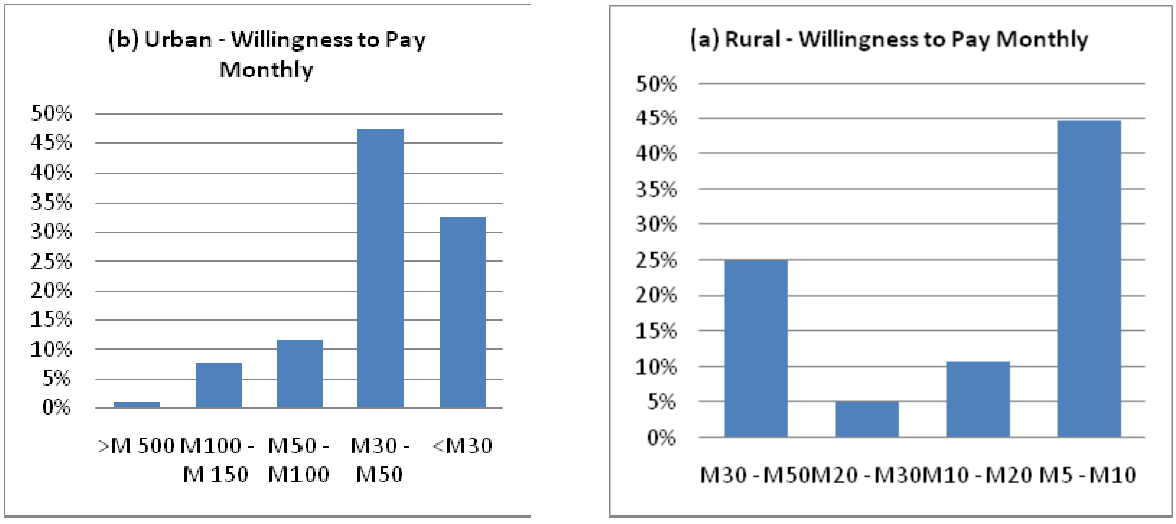
Figure 52: Willingness-to-pay for water connections

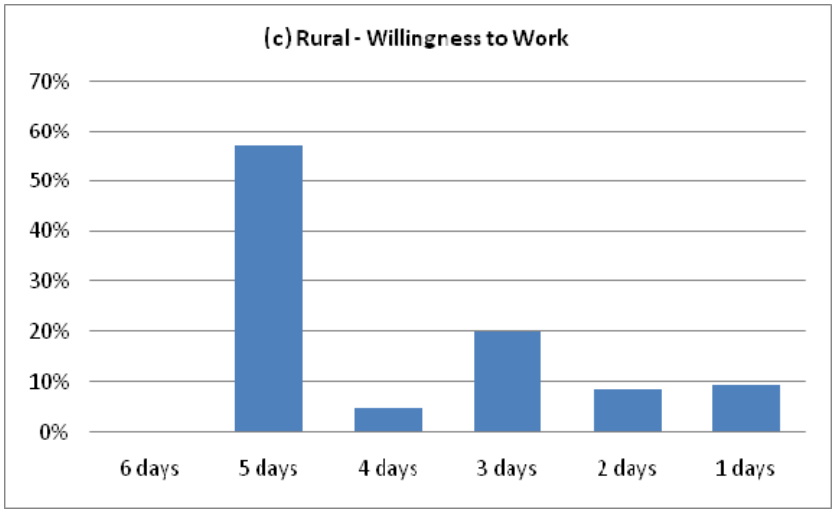


5.2.8 Willingness to pay for monthly water consumption/system maintenance

Other than willingness to pay for water connections, respondents were asked how much they would be willing to pay for water consumption (urban households) or system maintenance (rural households) on a monthly basis. Rural households indicated two forms of payment: (i) cash and (ii) time/labour. The results are reported if Figure 53.

Figure 53: Willingness-to-pay for monthly water consumption/system maintenance





The majority of households (45%) indicated that they would be willing to pay M5.00-M10.00 per month for total water consumption. Twenty five percent (25%) indicated that they would be willing to pay M30.00 – M50.00. A smaller percentage, 5% and 10% indicated that they would be willing to pay M20.00 – M30.00 and M10 – M20, respectively. This may indicate that only a small percentage of urban water consumers consume large amounts of water or that generally people do not want to pay for water.

In the rural areas, the majority of households (48%) would be willing to pay M30.00 – M50.00 for system maintenance on monthly basis. This is higher that the M20.00 which has been recorded from the field and indicates that the majority of the households are committed to assurance of reliable water supply. The majority of households (58%) without sustainable income pledged to dedicate five days in a month towards system maintenance, again which indicates the high value households attach to reliability of water supply

5.2.9 Willingness to pay for sanitation services

About 40% of households do not have access to sanitary services. The majority of these households either do not have reliable income or earn less than M1000 a month. Table 26 indicate willingness to pay for different categories of sanitary by urban and rural households. Asked how much they would be willing to pay for sanitary services, all the households from the urban and rural areas indicated that they would not be willing to pay for flush toilets. In the urban areas, the majority of households (48%) indicated that they would be willing to pay between M500 and M1000 for VIP toilets while 60% indicated that they would be willing to pay up to M500 for ordinary pit latrines. These willingness to pay categories indicate income categories and affordability capabilities of the households in question, which is encouraging because the currents costs of said facilities more or less fall within the selected willingness to pay categories. The choice of sanitary facility and willingness to pay by these households match their economic background presented under socio-economic background of the surveyed households.

Table 26: Willingness-to-pay for sanitation services

	Urban			Rural		
Amounts	Flush	VIP	Ordinary Pit	Flush	VIP	Ordinary Pit
>M5000	0%	0%	0%	0%	25%	2%
M4000-M5000	0%	0%	0%	0%	4%	2%
M3000-M4000	0%	5%	0%	0%	4%	2%
M2000-M3000	0%	10%	0%	0%	13%	12%
M1000-M2000	0%	0%	0%	0%	4%	6%
M500-M1000	0%	48%	34%	0%	21%	20%
<M500	0%	38%	66%	0%	29%	56%
	0%	100%	100%	0%	100%	100%

5.2.10 Comparison between current and previous WAP studies

The previous WAP studies highlight marked differences between rural and urban areas. In the urban areas the majority of households are willing and able to pay for water and sewerage services, as long as WASA is able to spread the connection costs over time and offer stepped tariffs. However, in the rural areas the studies indicate that though consumers are willing to pay for services, their capacity to do so is low given their poverty levels. The current study does not show significant differences between urban and rural households in terms of ability and willingness to pay. Both categories of households are willing to pay for water and sanitation services but have low affordability as a large percentage of the households (more than 30%) in both categories do not have reliable monthly income and can thus can be considered as destitute. Less than 10% of these households earn monthly income between M1000.00 and M3000.00 and less than 5% earn income above M5000.00 per month.

It can therefore be concluded that, for the mountain households to have reliable access to water, water connections will have to be subsidised by government.

5.2.11 Households attitudes towards water consumption

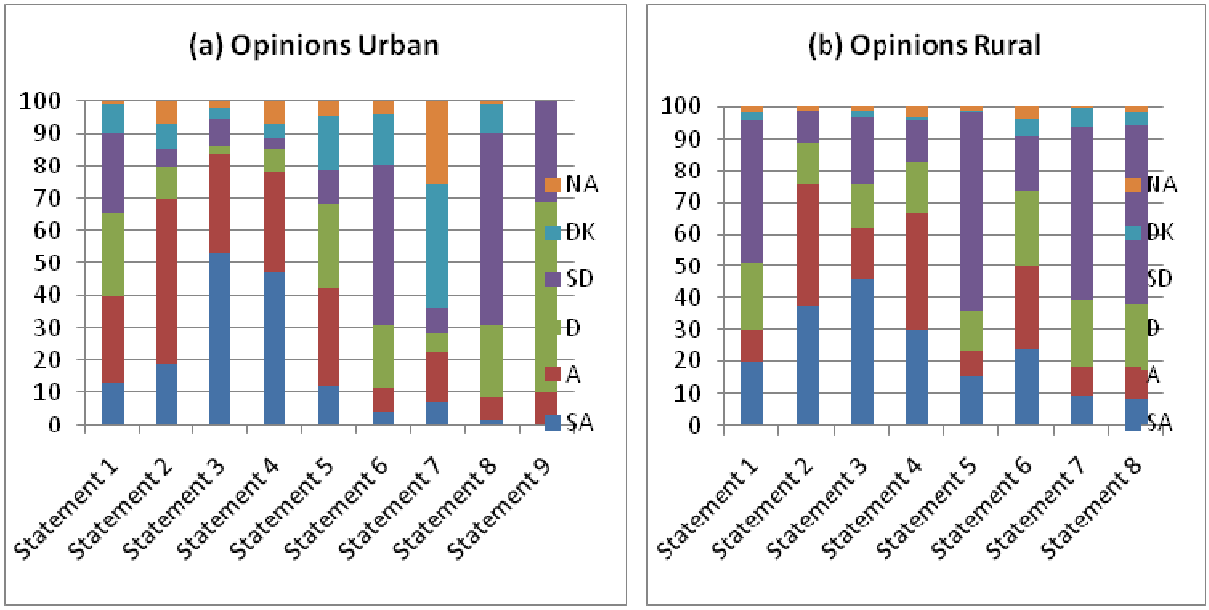
In order to decipher how households generally view water consumption and their attitudes towards water and it's use, the surveyed households were asked to indicate in they agreed or disagreed with the following statements:

i) Relatively wealthy households should pay more for water that relatively poor families
ii) My household would be willing to pay more for water if supply is reliable
iii) It is appropriate for households who use a lot of water to pay relatively high price for every litres consumed
iv) If my household has to pay more for water use, we will reduce our consumption
v) It is appropriate for every household to pay for water consumption irrespective of whether relatively poor or rich and if public water taps where water is free should be discontinued
vi) If we were charged M20.00 for water consumption, this would not change our consumption behaviour as water constitute a very small percentage of our consumption expenditure
vii) If we were to pay monthly instalments of M20.00 for water consumption, we would rather look for free water, even if a distant away
viii) Many households in the urban areas of Lesotho can afford to generate M1000.00 if necessary. It's just a matter of looking at several ways of generating income, including families and friends (applicable only to urban consumers)
ix) It is not necessary to worry about whether relatively poor households should get free water as all households in Lesotho can afford to pay for water

Participants were asked to indicate if they strongly agree (SA), agreed (A), disagreed (D) or strongly disagreed (SD) with the statements, or if they did not know (DK) or if they felt the statements were not applicable in their situation (NA).

Figure 54 below shows how the households in the urban and rural areas responded.

Figure 54: Responses to attitudinal statements (%)



Responses from urban and rural households were consistent for most statements. The majority of respondents in both groups of households disagreed that relatively wealthy families should pay relatively high prices for water than relatively poor households, which implies that households do not support the idea of cross subsidization between rich and poor households.

The majority of households in both categories agreed that they would be willing to pay more for water if supply is reliable, which is indicative of high value consumers from both categories place on water reliability. Respondents from both categories of households support increasing block tariffs in the sense that those who use more water should pay more. They agreed that if their households have to pay more for water or if water price were to increase, they would cut down consumption, which means that water demand management strategy through proper water pricing may be effective in inducing efficiency and sustainable water use.

While asked whether it's appropriate for every household to pay for water irrespective of their income level and that free water taps should be eliminated, the majority of respondents from urban areas agreed while those from the rural areas disagreed. This is not surprising given that rural households are relatively poorer and vulnerable than urban households.

Surprisingly, when asked whether paying M20.00 for water per month would not induce any change in consumption behaviour since this constitutes a small share in their total consumption expenditure, the majority of urban households disagreed while the majority of those in the rural areas agreed. This could be due to that fact that people in the rural areas do not yet have water systems where they have to pay monthly instalments for water consumption.

Asked whether instead of paying M20.00 per month for water they would rather look for alternative sources, even if such sources were a distant away, the majority of households from the urban areas indicated that they do not know what they would do while others indicated that this is not applicable to them. This is probably due to the fact that there are not many alternative sources of portable water in the urban areas. In the rural areas, the majority of households disagreed that they would look for alternative sources, which shows the value they attach to portable water.

On whether there is no need to worry about giving relatively poor households free water, the majority of households from both categories disagreed, which indicates that both categories of households are in support of the current lifeline policy of government that gives basic requirements of water freely to households to ensure that even poor households have access to basic water requirements.

Statement (viii) which was only addressed to urban households, the majority of households disagreed that the majority of households in the urban areas can easily generate M1,000 if necessary

to pay for water connections, which indicates that affordability of water connections in the urban areas is not as high as one would think.

5.3 Conclusion

Despite the low capacity that the surveyed households have to afford water and sanitation services payments, from the forgoing analysis the households appreciate that the services have to be paid for as expressed in their willingness to pay for different categories of services and responses to attitudinal statements above. The majority of the households without direct access to water are already paying for it anyway. It is therefore clear from the analysis that the households are committed to paying for water and sanitation services, especially as long as water supply can be reliable and within close reach.

It is therefore recommended that where system costs are prohibitive (e.g. water connection fees), government should subsidize installation of such systems to reduce the cost burden from the consumers. But from the analysis, the consumers will be able to pay water monthly bills and system maintenance costs.

6 DEVELOPMENT OPTIONS

6.1 Development Vision

The overall guidance for development options shall be the Government of Lesotho's planning documents such as the poverty reduction strategies (PRSP) and the Vision 2020 and the targets implied in the MDGs. Within the overall scope set out by these documents, as described in Chapter 2.1, there can be different development scenarios that can be explored to analyse the possible options for the development of the water services sub-sector.

The first thoughts on these development scenarios are described below in Chapter 5.2 based on discussions in the TWG.

The planning documents sets the overall targets for the water services in terms of coverage – 75% by 2015 and 100% by 2020 for water and sanitation in both rural and urban areas for water and sanitation.

6.2 Development Scenarios

Within the overall frame set by the Vision 2020, the development of water services in Lesotho could be analysed according to the following four scenarios:

1. Business as usual
2. High Growth with Urban and Industrial Focus
3. High Growth with Rural Development Focus
4. Low Growth

The intention of the scenarios is not to choose *'one winner'* as the best representative of future development, but to allow the planning tools to show the consequences for the water sector investments and financial requirements depending on the different development possibilities.

6.2.1 Scenario 1: Business as Usual

The 'Business as Usual' scenario is intended to show the investment requirements and development in the sector should the development indicators that have been prevalent over the last years continue in the future. This would imply:

- Economic growth similar to the recent approximately 3% - 4%
- Total population stabilising with continued moderate population growth in urban areas of 3.6% and general decrease of population in the rural areas especially in the lowlands and foothills of -0.65%
- The population development is affected by high mortality rates due to the HIV/AIDS pandemic and by continued migration to South Africa
- Prevalence of HIV infections would stabilise at the present levels of 29% in urban areas and 22% in rural areas. Impact will continue to be serious possibly impacted by urbanisation and inadequate resources for fighting the disease.
- Some growth in industries in urban areas, limited to Maseru, Maputsoe and Mafeteng – however the development over the last couple of years indicates that the new industries will be less water demanding than the present textile industries. Little emphasis on water demand management in the existing textile industries.
- Continued inadequate effort in adaptation to climate change and improved natural resource management in rural areas

6.2.2 Scenario 2: High Growth with Urban and Industrial Focus

The 'High Growth with Urban and Industrial Focus' scenario is intended to show the investment requirements and development in the water services sector should the drive to further industrialise the Lesotho economy succeed. This would imply:

- Higher economic growth, possibly by 6% or above

- Total population growing moderately but with higher rates of rural-urban migration due to industrial development in the urban centres. Population growth in urban areas could be as high as 5% and the general decrease of population in the rural areas continuing at higher rates in lowlands -1%. The rural population in the mountains stabilising at present level.
- The population development is affected by continued high mortality rates due to the HIV/AIDS pandemic but the migration to South Africa reduced due to more job opportunities in the urban areas in Lesotho
- Prevalence of HIV infections stabilising and possibly reducing but affected negatively by the urbanisation and positively by more adequate resources available for fighting the disease.
- Sustained growth in industries in urban areas, also the other urban centres presently without industries focussing on the LNDC plans for industrial parks in Botha Bothe, Mohale's Hoek and Teyateyaneng.
- Continued water demand in textile industries with little emphasis on recycling and water demand management. New industries will be less water demanding than the present textile industries
- Continued inadequate effort in adaptation to climate change and improved natural resource management in rural areas.

6.2.3 Scenario 3: High Growth with Rural Development Focus

The 'High Growth with Rural Development Focus' scenario is intended to show the investment requirements and development in the water services sector should development be more balanced between the rural and urban areas. This would imply:

- Higher economic growth, possibly by 6% or above spurred by improved economic activities in rural areas promoted by programmes targeting agricultural production and small scale processing industries adding value to the agricultural products and creating jobs in both rural and urban areas.
- Total population growing moderately but with reduced rates of rural-urban migration due to better possibilities for economic activities in rural areas. Population growth in urban areas might continue close to the present about 3.5% and the general decrease of population in the rural areas would stop and the population in the lowlands as well as the mountains grow at 1% to 2%.
- The population development is affected by reduced mortality rates due to the HIV/AIDS pandemic and reduction of migration to South Africa due to more job opportunities in the general in Lesotho
- Prevalence of HIV infections reducing, affected positively by the reduced urbanisation and more adequate resources available for fighting the disease.
- Moderate growth in industries in all urban centres and growth in demand for water for productive purposes in rural areas.
- Improved water demand management in the existing textile industries. New industries could be water demanding since the processing of agricultural produce is likely to be more water demanding than the present growth in manufacturing of e.g. electrical products
- Sustained effort in adaptation to climate change and large investments in management of water resources and catchment management that will be the basis for the improved economic activities in rural areas.
- Increased investments needed in water for productive uses in rural areas.

6.2.4 Scenario 4: Low Growth

The 'Low Growth' scenario is intended to show the investment requirements and development in the water services sector should the unfortunate situation arise where the Lesotho economy for various reasons does not achieve the desired economic development targets to reduce poverty. This could occur for internal reasons such as political instability or for external reasons such as pronounced impact on the world economy of climate change; continued or prolonged economic recession, reduced stability and development in the Southern African region, increased impact of the HIV/AIDS pandemic etc. This scenario would imply:

- No economic growth

- No population growth due to continued high mortality rates due to the HIV/AIDS pandemic and high levels of migration to South Africa due to less job opportunities in the general in Lesotho. Continued rural-urban migration due to less job opportunities in rural areas
- Prevalence of HIV/AIDS affected negatively by urbanisation and inadequate resources available for fighting the disease.
- Stagnation in industrial growth
- Resources not available for a sustained effort in adaptation to climate change and improvements in management of water resources and catchment management

These development options are intended to guide the development of the SFPM to include the appropriate technical and policy variables. Eventually, when preparing the financing strategy, the analysis might result in the development of a most likely compromise scenario that can be presented as a possible picture for the development of the water services.

Some of the aspects such as irrigation and catchment management investments would only be possible to describe when possibly in the future the water sector would further develop the planning tools to cover the full IWRM scope.

6.3 Development Options

Within the four development scenarios there can be specific development options to be considered to improve the water services and/or the financing of the sector. These have been identified and discussed in the TWG. Examples of these are:

Urban water:

- Comprehensive programme on calibration and replacement of old water meters
- Specific programme on zoning and metering supply areas to identify and reduce UfW[27]
- Improved customer registration by e.g. GIS mapping of connections and collection of information on the use of water to reduce illegal connections and improve the data foundation for planning
- Improved management of groundwater sources – especially important with the substantial new investments in borehole sources in Maputsoe, Teyateyaneng and Roma
- Increased connection rates by e.g. making it less expensive or free to connect and collect the cost of connections over the tariff (the prepaid cell-phone model)
- Management of the existing rural water supplies within the urban boundaries needs to be considered – continued support from DRWS until WASA services cover the communities or integration into the WASA operations. Technology options for supplying these rural communities within the urban boundaries

Urban Sewerage:

- Introduction of other on-site technologies than VIPs e.g. Eco-San or pour-flush toilets

Rural Water and Sanitation:

- Investment in long-term planning of regional water schemes in the foothills including systematic monitoring of possible water sources
- Subsidising rainwater harvesting as supplements to community water supplies to provide higher level of service or compensate for inadequate water sources
- Improved planning and coordination with Local Authorities and development of a common financing mechanism for supporting rural water and sanitation

[27] There are various sources of finance that could be explored by WASA for these e.g. commercial finance supported by the WDM initiative administered by the Development Bank of Southern Africa or WSP-AF in Nairobi, the African Water Facility, the EU Water Facility etc.

- More emphasis on developing capacity in Local Authorities and community structures for management, operation and maintenance to reduce the non-functioning supplies
- Options for sanitation technologies other than the VIP latrines

Lowlands Bulk Water Supplies:

- Models for supply to rural communities – supply into existing reservoirs using the existing distribution systems and community management of the payment for water or development of separate distribution networks for private connections
- Use of highland water resources for the lowlands when the water sources for the present schemes are inadequate.

Free Basic Water

In addition, there are options to be considered for how to implement the policy principle of free basic water for households that cannot afford. Some of the issues to consider include:

- In the WASA supply areas, vulnerable households could be provided with a pre-paid or post metered connection (paid by Government or through cross-subsidy for high-consuming customers) and receive a free allocation each month
- It does not make an impact to provide free basic water for the households that are already connected and receive water at a subsidised rate of the households that do not have a connection have to pay far more for a lower standard of service – e.g. by buying from neighbours
- In community managed rural water systems the Local Authorities could provide contributions to O&M costs for the vulnerable households
- Clarification is needed on how the vulnerable households are identified

Annex A: BOS Population Data

POPULATION GROWTH 1996-2006								
BOTHA-BOTHE								
		1996 POPULATION			2006 POPULATION			
COMMUNITY COUNCIL NAME	CODE	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	Growth %
RURAL POPULATION		45,961	46,204	92,164	45,429	46,233	91,662	-0.05%
MAKHUNOANE	B01	5,085	5,090	**10,175**	4,052	4,079	**8,131**	-2.22%
LIQHOBONG	B02	3,533	3,542	**7,075**	3,073	2,981	**6,054**	-1.55%
NTELLE	B03	2,247	2,162	**4,408**	2,599	2,708	**5,307**	1.87%
LIKILA	B04	9,876	10,379	**20,255**	9,512	9,832	**19,344**	-0.46%
KAO	B05	2,209	2,110	**4,319**	2,612	2,683	**5,295**	2.06%
SEKHOBE	B06	1,871	1,746	**3,617**	1,969	1,916	**3,885**	0.72%
MOTENG	B07	7,863	7,807	**15,670**	8,423	8,466	**16,889**	0.75%
LINAKENG	B08	2,098	2,068	**4,166**	2,011	2,069	**4,080**	-0.21%
TSA-LE-MOLEKA	B09	9,313	9,416	**18,729**	9,244	9,549	**18,793**	0.03%
LIPELANENG	B10	1,866	1,884	**3,750**	1,934	1,950	**3,884**	0.35%
URBAN POPULATION								
LIPELANENG	B10	12,492	13,437	**25,929**	12,622	13,732	**26,354**	0.16%
LERIBE								
RURAL POPULATION		118,344	119,780	238,124	116,073	118,399	234,472	-0.15%
LIMAMARELA	C01	3,164	3,139	**6,303**	4,318	4,383	**8,701**	3.28%
MPHOROSANE	C02	3,998	3,851	**7,849**	4,701	4,705	**9,406**	1.83%
SESHOTE	C03	4,147	4,055	**8,202**	4,683	4,666	**9,349**	1.32%
MATLAMENG	C04	5,225	4,903	**10,128**	5,099	5,061	**10,160**	0.03%
PITSENG	C05	9,186	9,454	**18,640**	9,317	9,590	**18,907**	0.14%
MOTATI	C06	5,093	5,214	**10,307**	5,064	5,039	**10,103**	-0.20%
FENYANE	C07	5,303	5,542	**10,845**	5,154	5,158	**10,312**	-0.50%
SERUPANE	C08	5,230	5,393	**10,623**	5,482	5,735	**11,217**	0.55%
MALAOANENG	C09	2,984	2,957	**5,941**	2,906	2,940	**5,846**	-0.16%
MENKHOANENG	C10	10,991	10,892	**21,883**	11,221	11,400	**22,621**	0.33%
MAISA-PHOKA	C11	6,287	6,553	**12,840**	6,335	6,339	**12,674**	-0.13%
SEPHOKONG	C12	10,964	11,051	**22,015**	9,492	9,633	**19,125**	-1.40%
LINARE	C13	5,479	5,534	**11,013**	4,941	4,956	**9,897**	-1.06%
LITJOTJELA	C14	10,725	11,101	**21,826**	10,523	11,037	**21,560**	-0.12%
HLEOHENG	C16	7,107	7,222	**14,329**	7,183	7,454	**14,637**	0.21%
MANKA	C17	12,437	12,573	**25,010**	10,510	10,828	**21,338**	-1.58%
TSOILI-TSOILI	C18	10,024	10,346	**20,370**	9,144	9,475	**18,619**	-0.89%
URBAN POPULATION								
LINARE	C13	6,615	7,435	**14,047**	7,037	8,016	**15,053**	0.69%
KHOMOKHOANA	C15	16,139	18,683	**34,822**	18,292	21,992	**40,284**	1.47%
BEREA								
RURAL POPULATION		93,225	96,042	189,267	91,538	93,759	185,297	-0.21%
MAKEOANA	D01	9,745	9,856	**19,601**	9,886	9,967	**19,853**	0.13%
MAPOTENG	D02	11,156	11,954	**23,110**	12,100	12,615	**24,715**	0.67%
KOENENG	D03	11,134	11,296	**22,430**	11,187	11,334	**22,521**	0.04%
TEBE-TEBE	D04	8,560	8,783	**17,343**	8,216	8,449	**16,665**	-0.40%
PHUTHIATSANA	D05	13,462	14,318	**27,780**	12,512	12,704	**25,216**	-0.96%
MALUBA-LUBE	D06	1,681	1,762	**3,443**	1,859	1,936	**3,795**	0.98%
MOTANASELA	D07	9,315	9,481	**18,796**	9,940	10,145	**20,085**	0.67%
SENEKANE	D08	12,996	13,246	**26,242**	11,004	11,134	**22,138**	-1.69%
KANANA	D09	10,319	10,485	**20,804**	9,397	9,671	**19,068**	-0.87%
THUATHE	D10	4,857	4,861	**9,718**	5,437	5,804	**11,241**	1.47%
URBAN POPULATION								
MALUBA-LUBE	D06	8,320	8,853	**17,173**	8,809	9,789	**18,598**	0.80%

POPULATION GROWTH 1996-2006								
		1996 POPULATION			2006 POPULATION			
COMMUNITY COUNCIL NAME	CODE	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	Growth %
MASERU								
RURAL POPULATION		119,150	123,097	242,237	113,767	117,312	231,079	-0.47%
QILOANE	A01	11,278	11,780	**23,058**	11,166	11,915	**23,081**	0.01%
RATAU	A02	13,154	13,289	**26,433**	12,812	12,956	**25,768**	-0.25%
LIKALANENG	A03	5,576	5,544	**11,120**	5,102	5,050	**10,152**	-0.91%
NYAKOSOBA	A04	5,958	6,048	**12,006**	5,389	5,473	**10,862**	-1.00%
MAKHEKA	A05	2,804	2,780	**5,584**	2,743	2,811	**5,554**	-0.05%
MANONYANE	A06	10,026	11,024	**21,050**	11,062	11,674	**22,736**	0.77%
MOHLAKENG	A07	11,012	11,530	**22,542**	9,420	9,828	**19,248**	-1.57%
MAZENOD	A08	12,064	12,956	**25,020**	12,650	13,760	**26,410**	0.54%
LILALA	A09	13,987	13,959	**27,946**	11,630	11,528	**23,158**	-1.86%
MAKHOARANE	A10	13,856	14,636	**28,492**	12,811	13,305	**26,116**	-0.87%
MAKHALANENG	A11	7,132	7,181	**14,313**	6,331	6,470	**12,801**	-1.11%
RIBANENG	A12	4,275	4,472	**8,747**	3,609	3,703	**7,312**	-1.78%
SEMONKONG	A13	1,596	1,499	**3,095**	2,014	1,957	**3,971**	2.52%
MAKOLOPETSANE	A14	3,263	3,341	**6,604**	3,967	3,895	**7,862**	1.76%
TELLE	A15	3,169	3,058	**6,227**	3,061	2,987	**6,048**	-0.29%
URBAN POPULATION								
MASERU MUNICIPALITY	001	78,050	89,333	**167,383**	111,332	134,078	**245,410**	3.90%
SEMONKONG	A13	2,104	2,329	**4,433**	2,763	3,090	**5,853**	2.82%
MAFETENG								
RURAL POPULATION		92,861	93,113	185,974	82,189	82,331	164,520	-1.22%
METSI-MATSO	E01	12,459	12,416	**24,875**	10,788	10,642	21,430	-1.48%
MAMANTSO	E02	11,396	11,505	**22,901**	10,721	10,513	21,234	-0.75%
MATHULA	E03	10,532	10,769	**21,301**	9,047	9,118	18,165	-1.58%
MONYAKE	E04	7,371	7,555	**14,926**	6,193	6,319	12,512	-1.75%
TAJANE	E05	3,509	3,500	**7,009**	2,880	2,883	5,763	-1.94%
RAMOETSANE	E06	5,212	5,496	**10,708**	5,211	5,358	10,569	-0.13%
MALAKENG	E07	4,541	4,685	**9,226**	4,284	4,309	8,593	-0.71%
MALUMENG	E08	5,332	5,060	**10,392**	5,166	4,947	10,113	-0.27%
KOTI-SE-PHOLA	E09	7,026	7,018	**14,044**	6,249	6,600	12,849	-0.89%
MAKHOLANE	E10	12,309	12,166	**24,475**	11,298	11,213	22,511	-0.83%
QIBING	E11	11,324	11,095	**22,419**	8,723	8,769	17,492	-2.45%
MAKAOTA	E12	1,850	1,848	**3,698**	1,629	1,660	3,289	-1.17%
URBAN POPULATION								
MAKAOTA	E12	10,577	12,016	**22,593**	14,065	16,512	**30,577**	3.07%
MOHALE'S HOEK								
RURAL POPULATION		79,477	81,624	161,539	74,389	76,988	151,377	-0.65%
SILOE	F01	10,954	11,153	**22,107**	9,477	9,352	**18,829**	-1.59%
MASHALENG	F02	8,020	7,716	**15,736**	7,071	7,350	**14,421**	-0.87%
MOTLEJOENG	F03	4,315	4,556	**8,871**	3,576	3,759	**7,335**	-1.88%
KHOELENYA	F04	11,937	12,295	**24,232**	10,698	11,556	**22,254**	-0.85%
TEKE	F05	2,953	2,985	**5,938**	2,775	2,791	**5,566**	-0.64%
MOOTSINYANE	F06	4,861	5,107	**10,405**	4,787	5,332	**10,119**	-0.28%
PHAMONG	F07	4,510	4,626	**9,137**	4,086	4,341	**8,427**	-0.81%
THABA-MOKHELE	F08	9,566	10,271	**19,837**	8,892	9,478	**18,370**	-0.77%
QOBONG	F09	5,396	5,513	**10,909**	5,097	4,978	**10,075**	-0.79%
QHOBENG	F10	1,196	1,153	**2,349**	1,640	1,504	**3,144**	2.96%
SEROTO	F11	3,746	3,601	**7,347**	4,078	4,068	**8,146**	1.04%
LIKHUTLOANENG	F12	4,249	4,350	**8,599**	4,080	4,164	**8,244**	-0.42%
NKAU	F13	4,547	4,805	**9,352**	4,521	4,715	**9,236**	-0.12%
QABANE	F14	3,227	3,493	**6,720**	3,611	3,600	**7,211**	0.71%
URBAN POPULATION								
MOTJOLELENG	F03	9,951	11,216	**21,167**	11,479	13,277	**24,756**	1.58%
QUTHING								
RURAL POPULATION		54,328	56,135	110,463	51,778	55,051	106,829	-0.33%
LIKHOHLONG	G01	4,335	4,373	**8,708**	3,628	3,778	**7,406**	-1.61%
MATSATSENG	G02	9,789	9,723	**19,512**	8,658	9,144	**17,802**	-0.91%
QOMOQOMONG	G03	3,586	3,700	**7,286**	3,373	3,561	**6,934**	-0.49%
LIPHAKOE	G04	878	901	**1,779**	1,271	1,393	**2,664**	4.12%
HA NKUEBE	G05	5,886	5,997	**11,883**	4,885	5,301	**10,186**	-1.53%
TSATSANE	G06	5,205	5,275	**10,480**	4,583	4,876	**9,459**	-1.02%
MKHONO	G07	4129	4520	**8,649**	4,727	5,059	**9,786**	1.24%
MOKOTJOMELA	G08	6,787	7,557	**14,344**	5,943	6,274	**12,217**	-1.59%
MPHAKI	G09	9,077	9,207	**18,284**	9,986	10,547	**20,533**	1.17%
SEFORONG	G10	4,656	4,882	**9,538**	4,724	5,118	**9,842**	0.31%
URBAN POPULATION								
LIPHAKOE	G04	6,183	6,903	**13,086**	6,014	6,793	**12,807**	-0.22%

POPULATION GROWTH 1996-2006								
		1996 POPULATION			2006 POPULATION			
COMMUNITY COUNCIL NAME	CODE	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	Growth %
QACHA'S NEK								
RURAL POPULATION		32,852	35,074	67,926	29,877	32,315	63,258	-0.71%
PATLONG	H01	5,314	5,745	**11,059**	5,154	5,882	**11,036**	-0.02%
WHITE-HILL	H02	1,522	1,604	**3,126**	1,434	1,655	**3,089**	-0.12%
LETLOEPE	H03	2,460	2,736	**5,196**	1,892	2,044	**3,936**	-2.74%
MASEEPHO	H04	3,996	4,422	**8,418**	3,649	3,867	**7,574**	-1.05%
MATEBENG	H05	1,981	2,139	**4,120**	1,630	1,803	**3,433**	-1.81%
MOSENEKENG	H06	1,283	1,219	**2,502**	1,116	1,163	**2,279**	-0.93%
THABA-KHUBELU	H07	2,402	2,533	**4,935**	2,566	2,653	**5,219**	0.56%
KHOMO-PHATSOA	H08	3,797	3,826	**7,623**	4,108	4,163	**8,271**	0.82%
RATSOLELI	H09	3,314	3,626	**6,940**	3,097	3,475	**6,572**	-0.54%
RAMATSELISO	H10	3,402	3,677	**7,079**	2,891	3,064	**5,955**	-1.71%
THABA-LITSOENE	H11	3,381	3,547	**6,928**	2,340	2,546	**5,894**	-1.60%
URBAN POPULATION								
LETLOEPE	H03	3,949	4,352	**8,301**	4,904	5,624	**10,528**	2.41%
MOKHOTLONG								
RURAL POPULATION		39,727	39,557	79,284	43,370	44,648	88,018	1.05%
MATSOKU	J01	2,091	2,032	**4,123**	2,374	2,383	**4,757**	1.44%
KHUBELU	J02	4,037	4,267	**8,304**	4,272	4,542	**8,814**	0.60%
MAPHOLANENG	J03	3,513	3,358	**6,871**	4,250	4,452	**8,702**	2.39%
PAE-LA-ITLHATSOA	J04	819	803	**1,622**	1,018	1,007	**2,025**	2.24%
POPA	J05	3,148	3,211	**6,359**	3,291	3,453	**6,744**	0.59%
MOLIKA-LIKO	J06	2,841	2,704	**5,545**	3,161	3,119	**6,280**	1.25%
KHALAHALI	J07	3,960	3,928	**7,888**	4,157	4,132	**8,289**	0.50%
MOREMOHOLO	J08	4,224	4,328	**8,552**	4,852	4,931	**9,783**	1.35%
SAKENG	J09	1,402	1,322	**2,724**	1,436	1,532	**2,968**	0.86%
MATEANONG	J10	3,175	3,084	**6,259**	3,785	3,721	**7,506**	1.83%
RAFOLATSANE	J12	4,293	4,228	**8,521**	3,777	3,910	**7,687**	-1.02%
MARUNG	J13	2,343	2,379	**4,722**	2,668	2,856	**5,524**	1.58%
LINAKANENG	J14	1,951	1,987	**3,938**	2,167	2,323	**4,490**	1.32%
TEKESELENG	J15	1,930	1,926	**3,856**	2,162	2,287	**4,449**	1.44%
URBAN POPULATION								
LIPHAMOLA	J11	2,463	2,776	**5,239**	3,872	4,643	**8,515**	4.98%
THABA-TSEKA								
RURAL POPULATION		57,172	58,961	116,103	59,179	60,798	119,977	0.33%
MALEHLOANA	K01	5,575	5,552	**11,127**	5,546	5,599	**11,145**	0.02%
MPHE-LEBEKO	K02	5,361	5,374	**10,735**	5,630	5,708	**11,338**	0.55%
BOKONG	K03	3,003	3,159	**6,162**	3,700	3,569	**7,269**	1.67%
THABA-KHOLO	K04	4,453	4,652	**9,105**	5,060	5,155	**10,215**	1.16%
LESOBENG	K05	5,389	5,403	**10,792**	5,470	5,570	**11,040**	0.23%
THABANA' MAHLANYA	K06	3,852	4,100	**7,952**	3,847	3,940	**7,787**	-0.21%
MOHLANAPENG	K07	4,693	5,035	**9,728**	4,879	5,027	**9,906**	0.18%
KHOHLO-NTSO	K08	3,106	3,207	**6,313**	3,356	3,656	**7,012**	1.06%
BOBETE	K09	5,745	5,994	**11,739**	5,834	6,209	**12,043**	0.26%
SENYOTONG	K10	3,409	3,475	**6,884**	3,858	3,882	**7,740**	1.18%
RAPOLEBOEA	K11	6,019	6,108	**12,097**	5,601	5,782	**11,383**	-0.61%
MONYETLENG	K12	3,820	4,029	**7,849**	3,547	3,738	**7,285**	-0.74%
SEHONGHONG	K13	2,747	2,873	**5,620**	2,851	2,963	**5,814**	0.34%
URBAN POPULATION								
THABANA' MAHLANYA	K06	2,396	2,604	**5,000**	3,131	3,431	**6,560**	2.75%
TOTAL								
Total rural				**1,483,081**			**1,436,489**	-0.32%
Urban outside maseru				**171,790**			**199,885**	1.53%
Total urban				**339,173**			**445,295**	2.76%
Total Lesotho				**1,822,254**			**1,881,784**	0.32%

Annex B: Results from WASA Connection Survey

The summary of results from the WASA survey:

- In average 26% of the WASA connections serve rented accommodation with an average of 4.1 households
- 20% of the WASA connections serve neighbours in addition to the owner's household and an average of 2.8 households
- In average 6.5 persons is served per connection
- 52% of connections serve persons through house installations and 48% of connections serve persons through yard taps
- 8% have alternative water supply from Boreholes and 35% collect rainwater to supplement the WASA water supply
- 64% use water storage to mitigate intermittent supply (12% tanks and 88% containers)
- The average per capita consumption is 51 l/p/day. Yard taps 42 l/p/day and house connections 67 l/p/day.

The per capita consumption figures are important planning information as the revenue generation and therefore the viability of the investments in new water services depend directly on the amount of water sold. As comparison, the lowlands bulk water projects are designed with an average per capita consumption of 100 l/p/day for urban areas and 60 l/c/day for the rural settlements. The recent 6 towns water project use present average daily demand of 68 l/p/day, raising to 122 l/p/day in 2015.

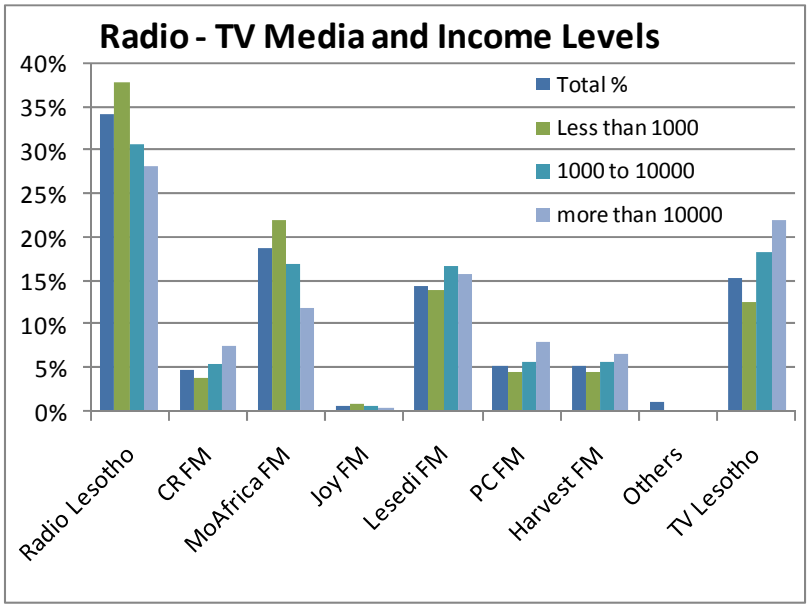
The number of persons served per connection is 6.5. This figure is important for the estimates of the present number of persons served and the coverage estimates. Since the coverage will be the main driving policy variable in the models, it is important to get reasonably accurate information on the present number of persons served.

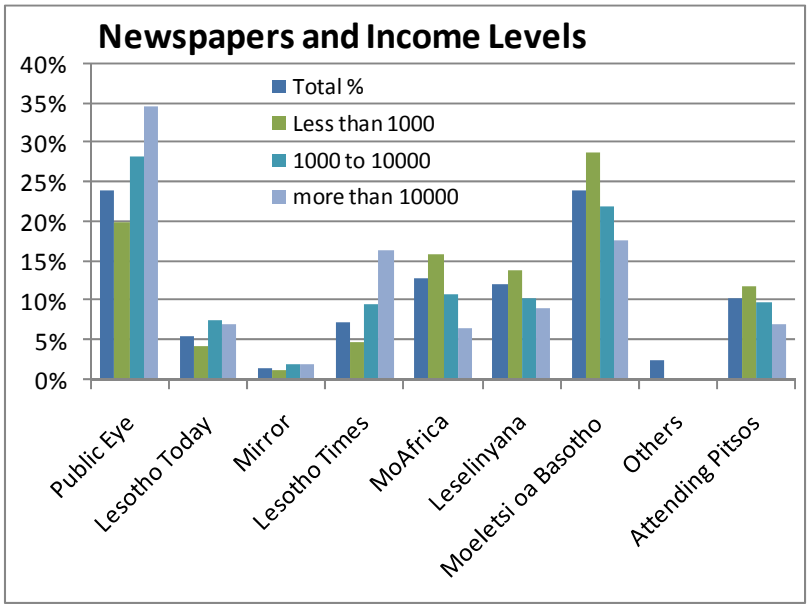
As comparison the WASA statistics are based on 5 persons per domestic connection + 100 persons per public standpipe.

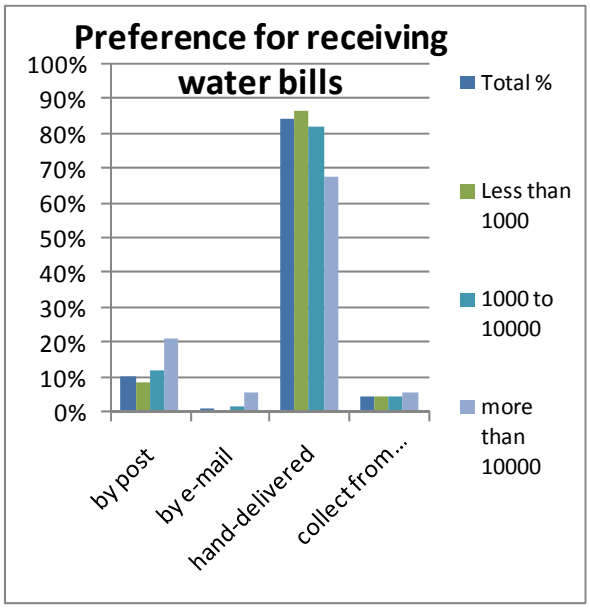
The 6.5 persons per connections in average seems quite low considering that 15% of the connections serve in average 2.4 households in rented accommodation within the owner's compound and 20% of the connections serve an average of 1.8 neighbouring households in addition to the owner's household. This could indicate that the rented accommodation is occupied predominantly by single or two person families.

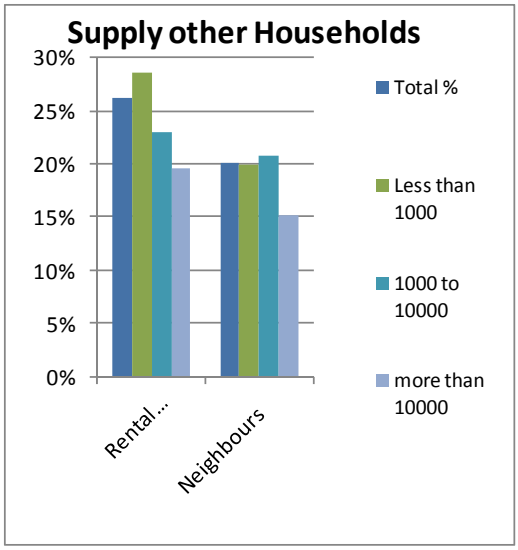
In addition to the questions on water and sanitation use, the questionnaire also included questions on communication (favoured newspapers and radio stations), how to receive water bills etc. since this survey was carried out in cooperation with the WASA Marketing Department.

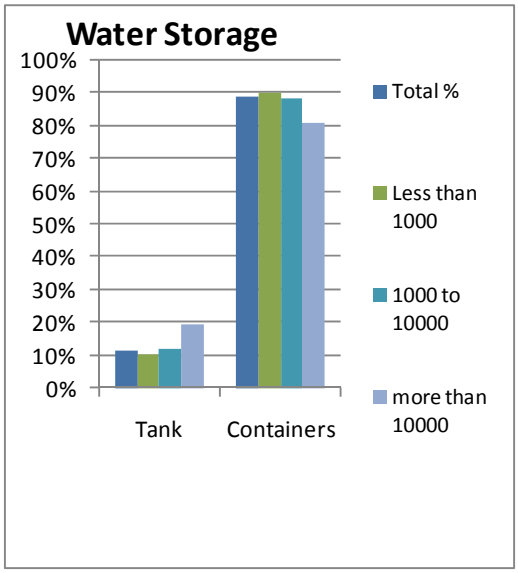
The detailed results analysed per income group (household income less than LSL 1,000 per month, between LSL 1000 and 10,000 and above LSL 10,000 per month) are presented below.

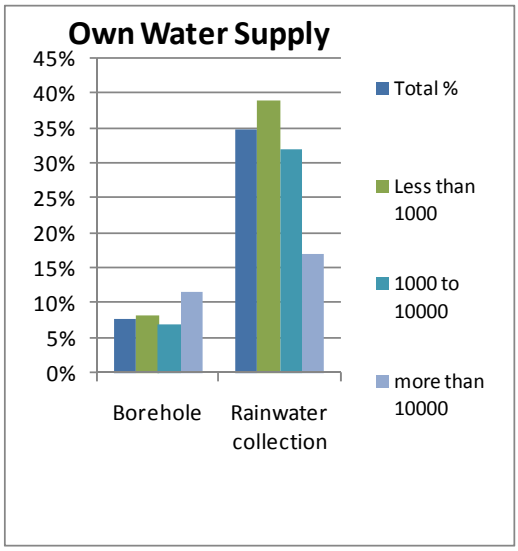

Radio - TV Media and Income Levels
40%
35%
30%
25%
20%
15%
10%
5%
0%
Total %
Less than 1000
1000 to 10000
more than 10000
Radio Lesotho
CR FM
MoAfrica FM
Joy FM
Lesedi FM
PC FM
Harvest FM
Others
TV Lesotho

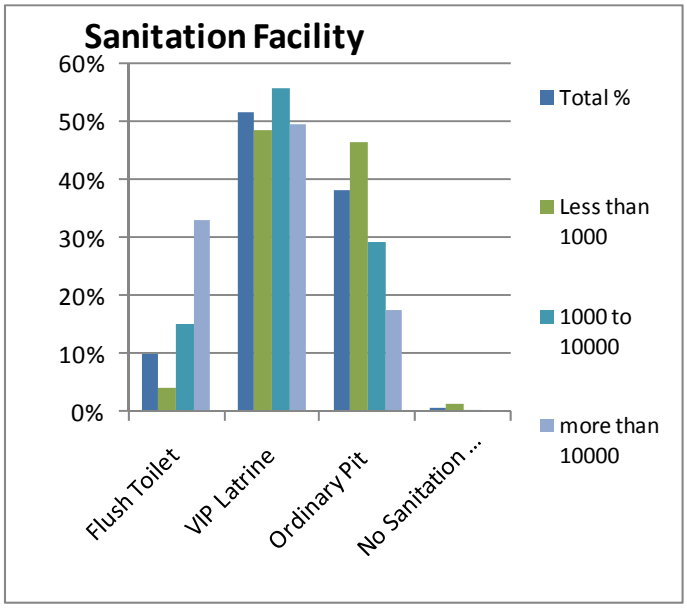

Newspapers and Income Levels
40%
35%
30%
25%
20%
15%
10%
5%
0%
Total %
Less than 1000
1000 to 10000
more than 10000
Public Eye
Lesotho Today
Mirror
Lesotho Times
MoAfrica
Leselinyana
Moeletsi oa Basotho
Others
Attending Pitsos


Preference for receiving water bills
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Total %
Less than 1000
1000 to 10000
more than 10000
by post
by e-mail
hand-delivered
collect from...


Supply other Households
30%
25%
20%
15%
10%
5%
0%
Rental...
Neighbours
Total %
Less than 1000
1000 to 10000
more than 10000


Water Storage
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Tank
Containers
Total %
Less than 1000
1000 to 10000
more than 10000


Own Water Supply
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%
Borehole
Rainwater collection
Total %
Less than 1000
1000 to 10000
more than 10000


Sanitation Facility
60%
50%
40%
30%
20%
10%
0%
Flush Toilet
VIP Latrine
Ordinary Pit
No Sanitation ...
Total %
Less than 1000
1000 to 10000
more than 10000

Annex C: Results from Peri-urban Survey

The results of the peri-urban surveys are presented below.

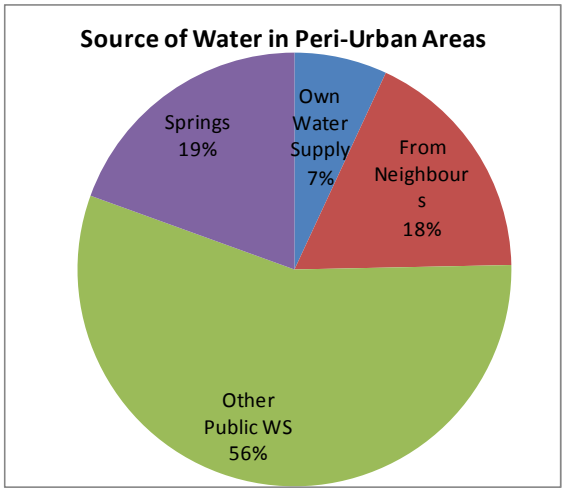
The peri-urban surveys were covering a total of 226 households and carried out in the following areas:

Maseru:	Penapena
	Makhoathi
	Likotsi
	Ha Foso
Maputsoe:	Mpharane
	St Monica

Figure 1 Water Sources

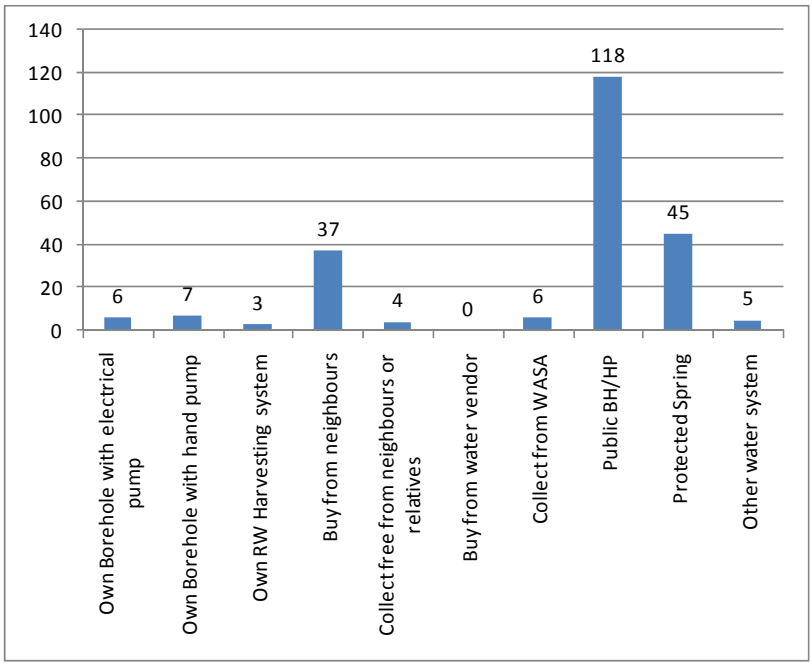
Water Sources:

The survey focussed on the water sources used by the households in areas not covered by the WASA network. As illustrated in Figure 1, the survey revealed that the largest proportion (56%) get their water from another public water supply predominantly hand pumps installed by the DRWS. 7% has their own water supply, either boreholes with electrical or hand pumps or rain-water collection systems and 18% gets water from neighbours. 19% collect water from springs.



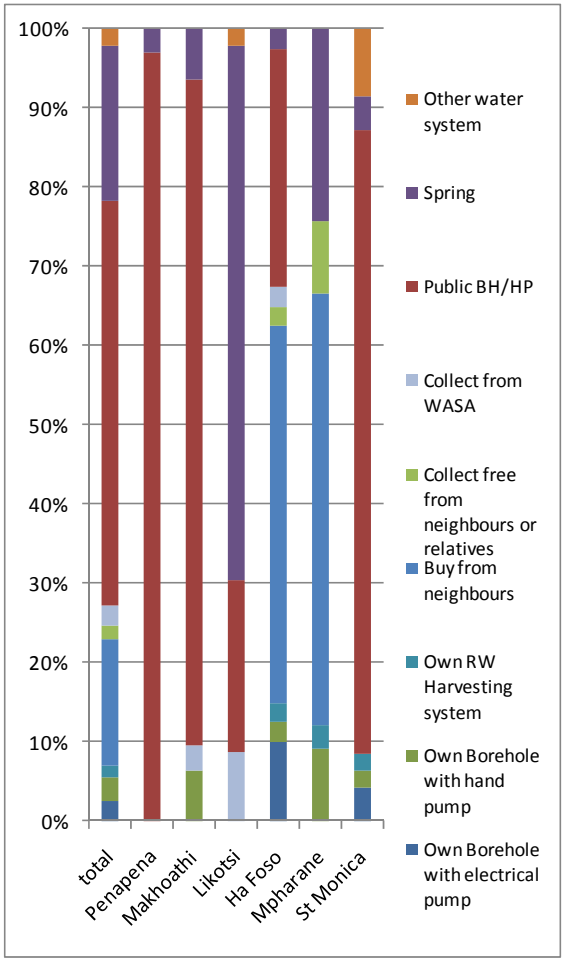
The detailed breakdown of water sources is shown in Figure 2

Figure 2: Water Source Details



None of the households buys water from water vendors and only a few collect from WASA standpipes. The distances to the WASA standpipes were more than 1km. The water from springs in peri-urban areas serving almost 1/5 of the households would not be expected to be of good water quality and is likely to be biologically contaminated.

Figure 3 Water Sources per area



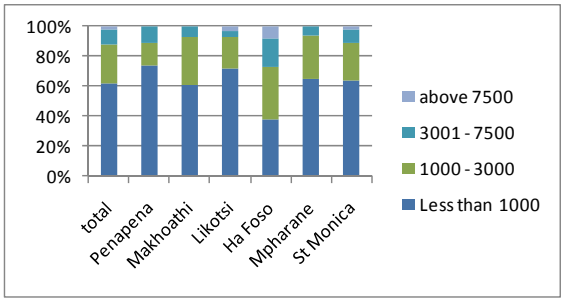
These average statistics from the 6 areas cover over large variations as illustrated in figure 3. The households in some areas (Pena-pena, Makhoathi and St Monica) are almost totally depending on public boreholes with hand-pumps while in other areas, self-supply and supply to neighbours are dominating such as Ha Foso and Mpharane.

The reasons for households investing in self supply and supplying neighbours are probably diverse.

In the case of Ha Foso, there could be a link to the income levels since Ha Foso has higher income level than the average and higher levels of self-supply. There are a total of 11 public hand pumps in Ha Foso being maintained by DRWS although possibly only half would be working due to lack of funding for maintenance.

In the case of Mpharane, also with a high level of self-supply, the reasons seems to be different since the income level in Mpharane is below average. In this case the emergence of self-supply could be a consequence of other water sources not being available e.g. in Mpharane there are no existing DRWS hand pumps and only limited access to springs. There is an old DRWS water system based on diesel pumping that is non-functioning, reportedly because of management problems. This could indicate a community where lack of leadership and community spirit has prompted households to seek their own water supply solutions

Figure 4 Income Levels per area



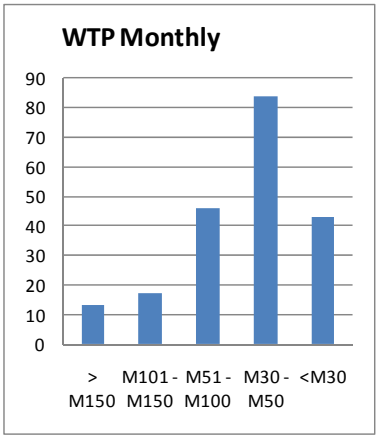
Cost of water

The majority of the households collecting water from neighbours pay for the water at a rate of M1 per 20l bucket. It should be noted that this is equivalent to M50 per m^3 or 15 times the lowest WASA tariff.

94% of the households without their own water supply indicated that they would be willing to connect to WASA should the network be extended to their area while only 75% of the households with own water supply would be interested in connecting.

The amount households are willing to pay for a WASA connection averages M2,300.

Figure 5 WTP for Water



The response to willingness to pay monthly water tariffs is illustrated on Figure 5. 21% indicate that they would not be willing to pay more than M30 per month which is the typical minimum WASA water bill including the standing charge. These results of the limited sample size will be taken into account in the analysis of the WAP studies.

Figure 6 Sanitation

Sanitation

The sanitation facilities in the peri-urban areas are predominately pit latrines as shown on Figure 6. There were no flush toilets in the households that were surveyed.

It should be noted that 15% of the households in the peri-urban areas do not have sanitation facilities and this must be causing a health risk in the community. 27% of the households without sanitation facilities indicate that they have access to the neighbour's facilities while the rest is using the 'mountain' or 'forest'.

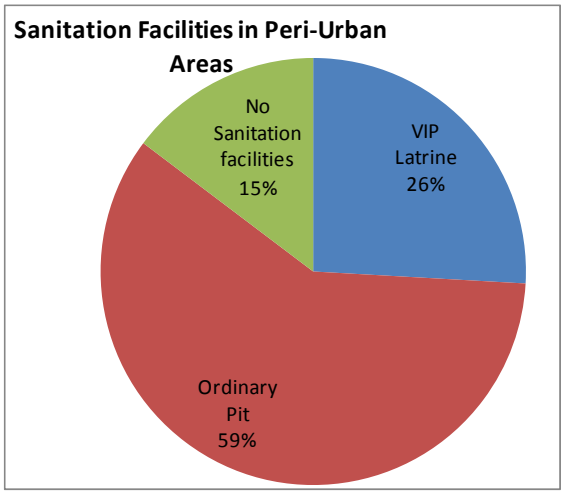


Figure 7 Sanitation per area

As with water supply, there are large variations between the areas as shown on Figure 7.

In Pena-pena more than half the households do not have sanitation facilities while the survey in other communities indicates good sanitation coverage. In the case of Pena-pena there seems to be a link to the household income levels as the income level is below average.

This cannot be the case in Ha Foso where there are also households without sanitation facilities although the average income levels are higher.

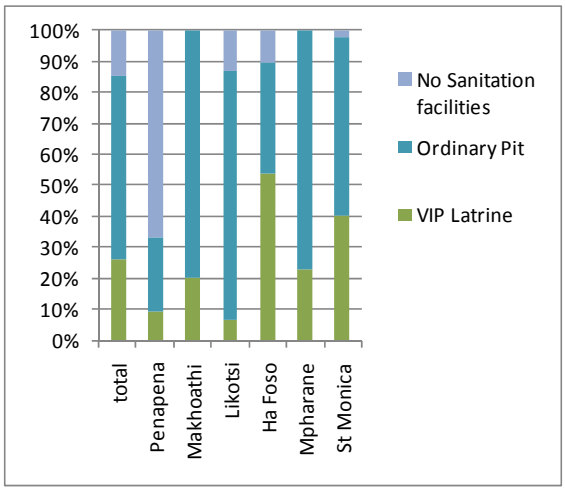


Figure 8 illustrates the household income levels for the households that do not have sanitation facilities.

Figure 8 Income Levels for HHs without Sanitation

The households in Ha Foso without sanitation all have monthly incomes below M1000 per month while in Pena-pena even households with higher incomes do not have sanitation facilities.

This could indicate that community habits (in Pena-pena it is common not to have sanitation facilities) in addition to income levels influence the motivation to invest in sanitation facilities.

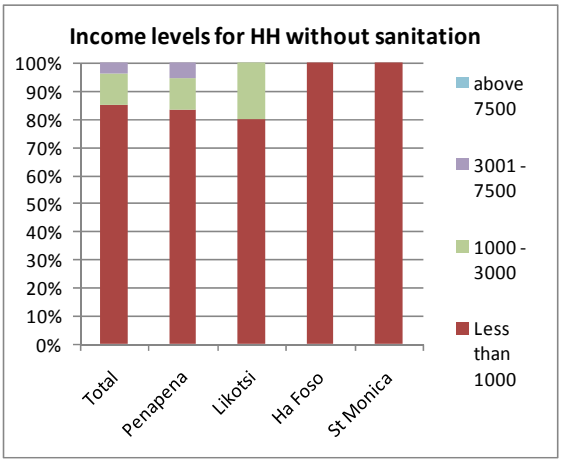


Figure 9 WTP for Sanitation

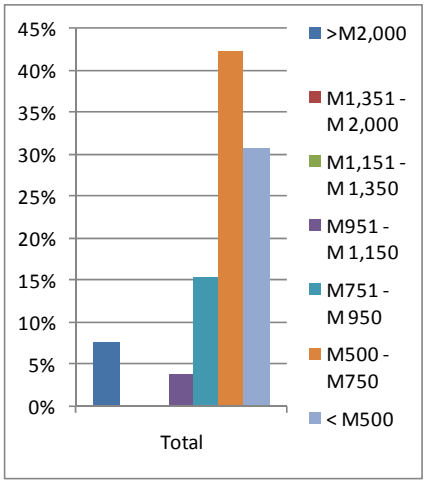


Figure 9 shows the response from households without sanitation facilities on the questions concerning the amount they are willing to invest in sanitation facilities.

The responses correspond well to the cost of the desired facilities as the few indicating willingness to pay more that M2000 were aiming for flush toilets. The responses should be compared to that low cost pit latrines using local materials can be constructed for less than M500 while the cheapest pre-made toilets (the light weight corrugated iron type) cost approximately M1000 and a fully lined VIP latrine constructed according to the designs promoted by environmental health and urban sanitation cost in the range of M2,500 to M4,000.

Annex D: Results from Rural Private Connection Survey

The following is an analysis of the results of the survey of attitudes towards private connections in rural water systems. The rural water surveys were covering a total of 212 households and were carried out in the following areas:

Mohales Hoek: Ha Sechele

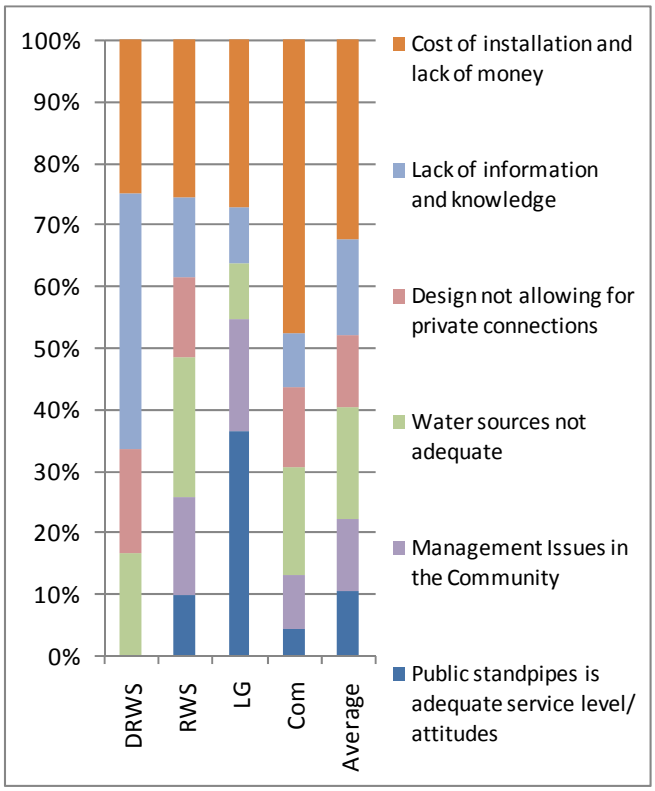
Maseru: Motloheloa
Masana
Matsieng
Masianokeng

Leribe: Tsikoane/ Matukeng

The first part of the survey was to get the opinions from different stakeholders from DRWS at national level; RWS staff in the districts to the local governments at Community Council level and from the community leadership involved in the management of the water systems

A summary of the opinions on why not more households are getting private connections in rural water systems is shown in Figure 1. The cost of the installation and lack of money is the main reason with 32% of the responses. It is noticeable that at the community level, the lack of money was the reason in almost 50% of the responses while at the national level this was only the opinion in 25% of the responses. The trend seems clear that the closer to the users, the more the opinion is that money is the limiting factor.

Figure 1: Opinions on private connection



At the national level the opinion is that lack of information dissemination and knowledge of the users of the possibilities of private connection and the water sector strategies and roles and responsibilities is a major contributing factor, as indicated in about 40% of the responses. This seems to be less of a problem at the local government and community level where the respondents seem to think that the information dissemination has been adequate.

At all levels there is agreement on that water resources and the fact that many new systems are not adequately designed for private connections is a problem – as seen by about 30% of the respondents.

The management of the water supplies in the communities is seen as a contributing factor especially at the community council level. This is not the case at community level, however since the community leadership (as respondents) is involved in management of the water systems this would naturally influence the result as few would say that they do not manage the systems adequately.

The perception that the public standpipes is an adequate level of service seems to be a dominating opinion at Community Council level where almost 40% of the respondents saw this as a main reason for not implementing more private connections. This perception is however not shared at community level.

The respondents from households with and without private connections are analysed below.

Statistics from Households

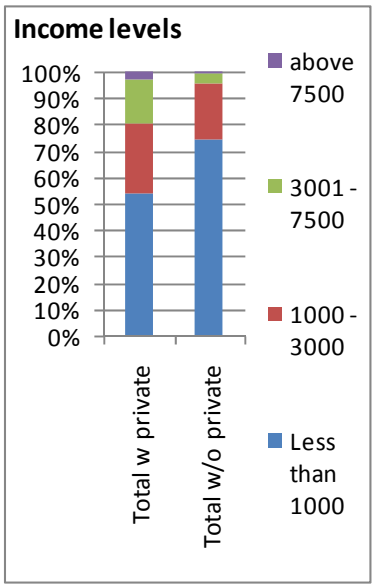
Information was collected from 140 households without private connections in Ha Sechele in Mohale's Hoek District; Motloheloa, Masana and Matsieng in Maseru District and Tsikoane/ Matukeng in Leribe District.

Information was collected from 72 households in Masane, Masianokeng and Matsieng from households with private connections in Maseru District.

The special circumstances in some of the systems are:

- In Ha Sechele the water system is designed for private connections however no households have been connected yet.
- The new water system in Motloheloa has recently been constructed and the arrangements for private connections are yet to be implemented. In this community, the water committee has been collecting M50 from household to buy materials and progressively implement the private connections from all households that wish to connect.
- The water system in Tsikoane/ Matukeng was designed for private connections and implemented more than 10 years ago, however no connections have yet been made due to different difficulties in the management and O&M of the system.
- The system in Masianokeng is also special since in this community the rural water system that was implemented 5 years ago has no public standpipes and all households were forced to connect or buy water from the neighbours. The WASA network has recently reached the village and some households have connections from both WASA and the rural water system.

Figure 2 Income levels

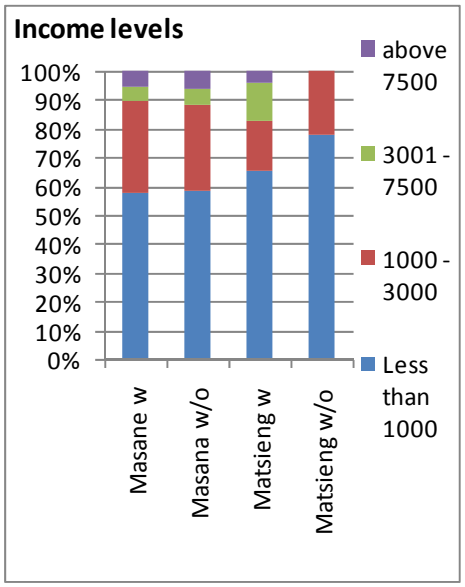


Information was collected on the income levels for households with and without connections.

The income levels for households with and without private connections are shown in Figure 2.

The survey results confirm the logic that households with private connections typically are better off economically than households without.

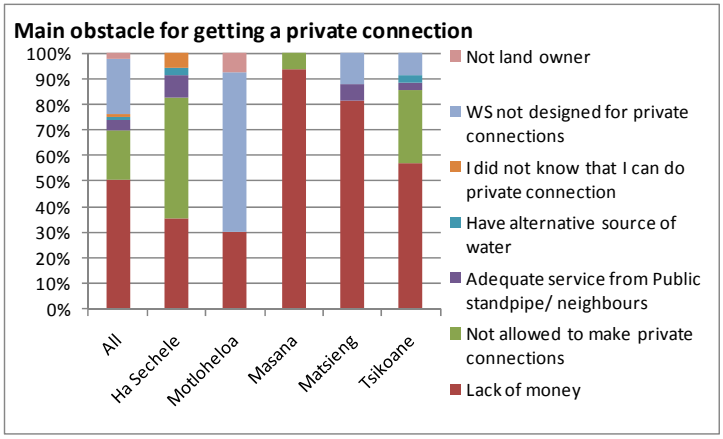
Figure 3 Income levels per area



There are however variations to this e.g. in Masana, there is no difference in income levels between the households with and without connections as shown on Figure 3 while in Matsieng the expected difference is evident.

Obstacles to getting private connections

Figure 4 Main Obstacles



The households without private connections were asked about the main obstacles for them to get a private connection. A summary of the responses are shown in Figure 4.

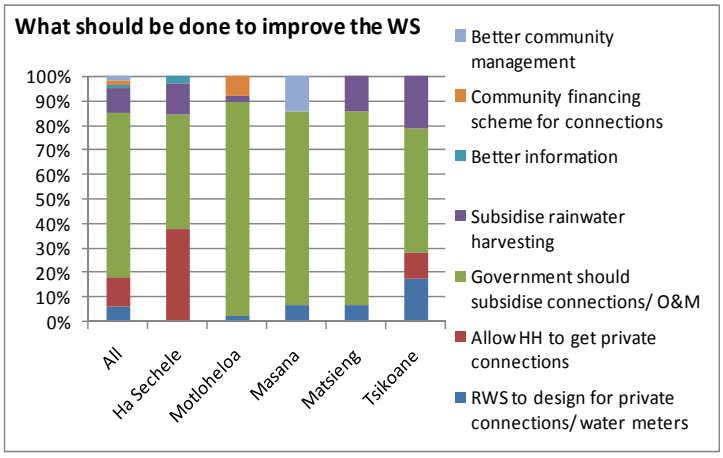
In general the households perceive the main obstacle to be poverty and lack of money for paying for the connection as in average this is mentioned by 50% of the households.

In addition there seems to be some more scheme specific obstacles such as a perception that the water system is not designed for private connections. This correlates with the opinion of the DRWS staff that lack of information is one of the main reasons that more households are not getting private connections as both the new scheme in Motloheloa and the Matsieng and Tsikoane schemes are designed for private connections.

The other main obstacle seems to be related to the management of the systems as well as information as many saw a lack of permission from either DRWS or the water committee as a problem.

What should be done to improve the water supply

Figure 5 What should be done to improve



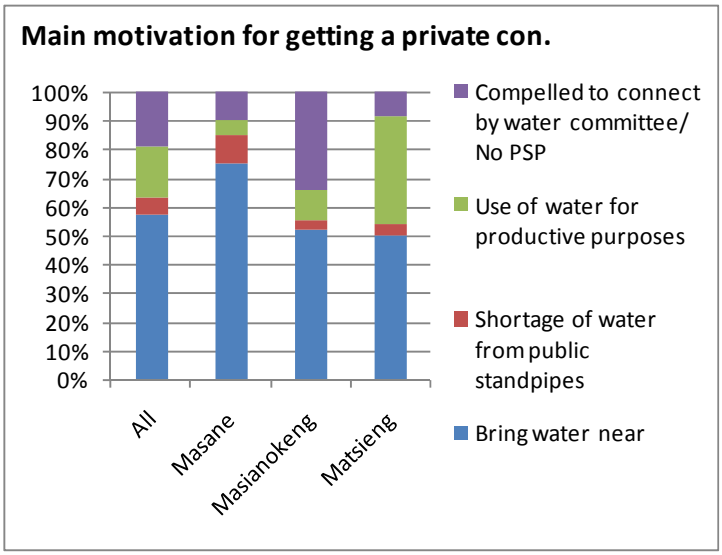
The households were also asked what could be done to improve the water supply situation in the community. A summary of the responses is shown in Figure 5.

The overwhelming response was that government should subsidise private connections. The responses on permission to make private connections being an obstacle is mirrored in the responses in Ha Sechele and Tsikoane that permission to make connections will improve the water supply situation.

In four of the five communities a number of households advocated for that the government should support households in getting rainwater harvesting tanks/ systems. This has been on the agenda of DRWS for the last few years but has never been operationalised.

Another interesting comment is the response in Motloheloa that the community should establish a scheme for financing the private connections.

Figure 6: Main motivation for getting a connection



Main motivation for getting a private connection

The households with private connections were asked what their main motivation for getting a private connection was. The summary of the responses is shown in Figure 6.

The obvious answer was in more that 50% of the households, the wish of bringing the water near to the household and avoid long distances and waiting time for getting water.

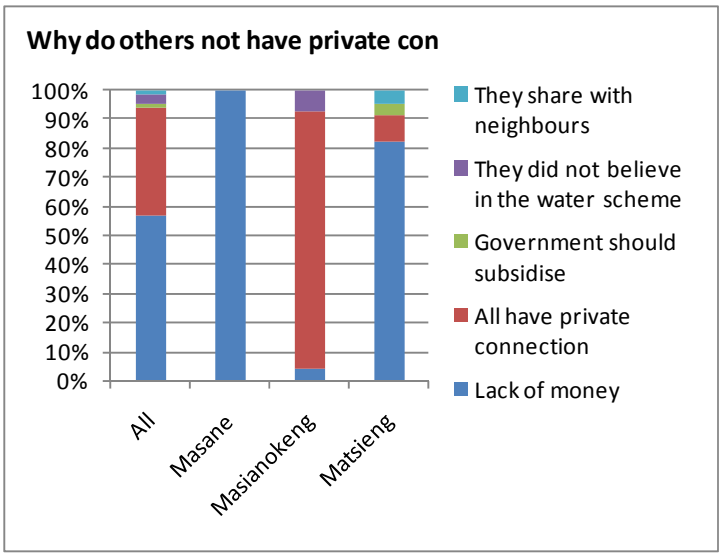
Interestingly also the pressure from the water committee to make connections was dominating especially in Masianokeng where the system was designed to only cater for private connections.

The use of water for productive uses was mentioned by a big group especially in Matsieng where about 40% use the water for livestock or gardening. This will need to be taken into account in the DRWS design standards for the volume of water allowed per person.

Why do others not have private connections

The households with private connections were also asked why they think not more households in the community are getting their own connections. The responses are shown in Figure 7.

Figure 7: Why other do not get connection



The overwhelming response was that lack of money is preventing other households from getting connected.

The responses in Masianokeng are unusual, but that is because the system was designed without public standpipes.

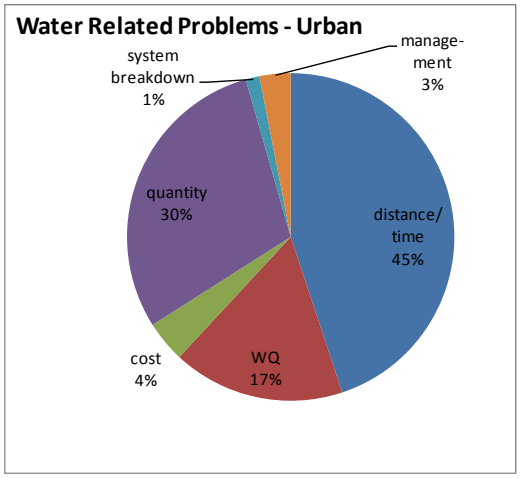
An interesting observation on the water data is that only 20% of the households with private connections use the connection for water installations in the house while most only install a yard tap. This would also affect the DRWS design standards on average per capita consumption.

Another result on the reliability is that the water systems are not operating continuously. The data from the households with connections indicate that 60 – 80% of the households have alternative ways of storing water since the systems do not operate 24 hours.

An interesting observation on the sanitation data is that is both the households with connections and the households without water connections it is common to share the sanitation facilities with neighbours as more than 70% of the sanitation facilities are shared. In no instances do the neighbours pay for the use of the sanitation facilities.

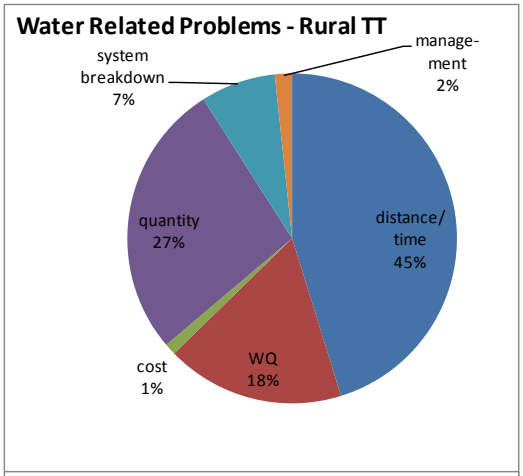
Annex E: Results from WAP Studies

The results from urban areas and rural areas in Thaba Tseka and Qacha's Nek Districts respectively have been entered and some very preliminary results are presented below.



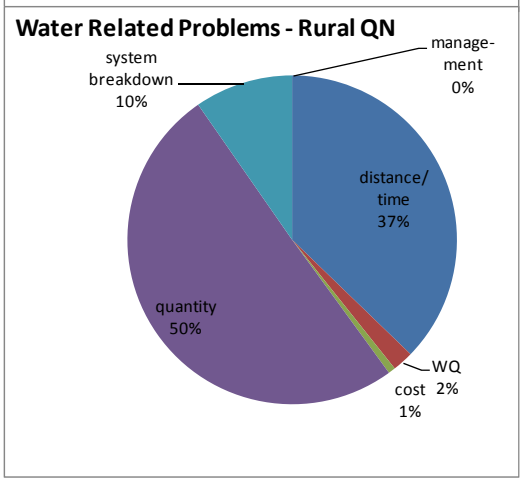
In the urban areas the locations surveyed are inside the WASA supply areas but not covered by the present distribution network. The rural areas in Thaba Tseka District are locations where there are inadequate old water systems (partly functioning diesel systems or hand pumps) and new water systems are planned and designed. The locations in Qacha's Nek District have existing gravity water systems.

Some of the questions were on identifying the main water related problems. The response is overwhelmingly in both rural and urban areas (approx 75%) that the water problems are related to the distance and time it takes to collect water and the available quantity of water. This is interestingly also the case in the rural villages in Qacha's Nek where there are existing systems. Here it is obvious that the present level of service from public standpipes is not considered adequate. Water Quality is a problem (approx 15%) for some of the supplies where people resort to unprotected springs.

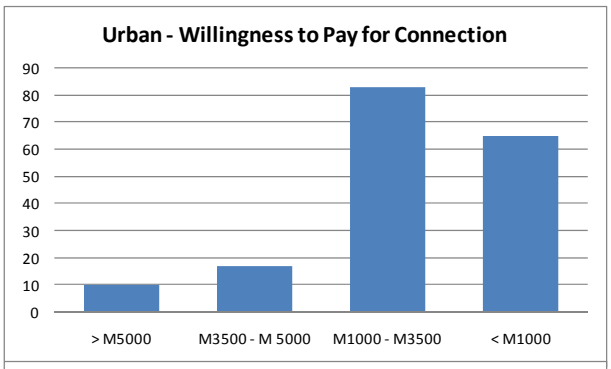


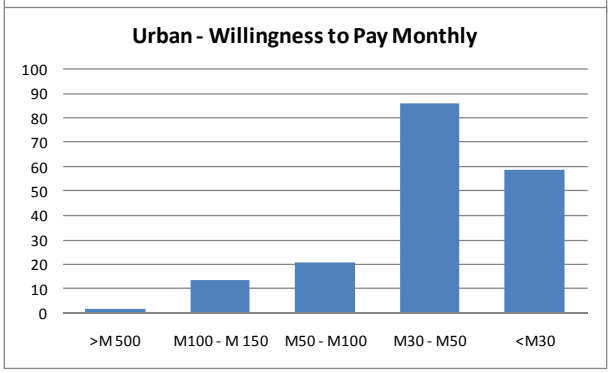
The cost of water seems to be a minor concern in all cases. System breakdown is more a problem in the rural than in the urban areas.

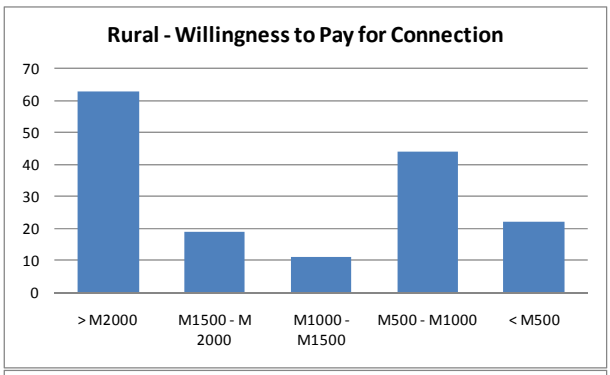
The willingness to pay questions were addressed in two manners: amount willing to pay for connection and amount willing to pay or work willing to do for regular monthly cost of maintaining and operating water systems.

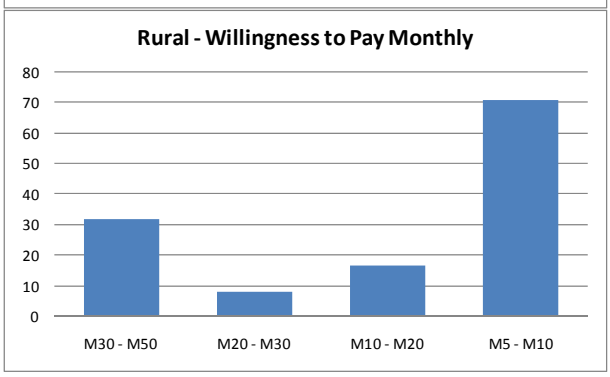


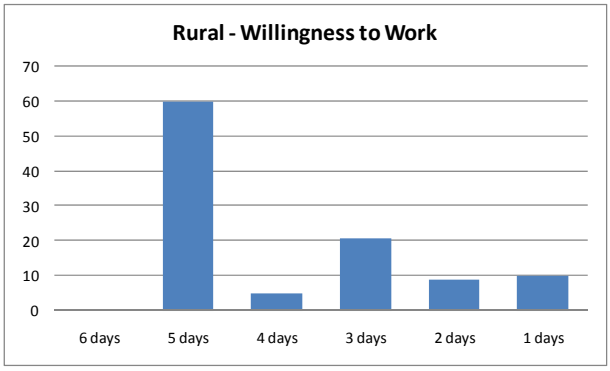
The responses are presented below. These are preliminary results and the responses will be further analysed and compared with the responses on willingness to pay in the peri-urban and the rural private connection surveys and with the results from previous WAP studies. The analysis will be presented in the baseline report.


Urban - Willingness to Pay for Connection
90
80
70
60
50
40
30
20
10
0
> M5000
M3500 - M 5000
M1000 - M3500
< M1000


Urban - Willingness to Pay Monthly
100
90
80
70
60
50
40
30
20
10
0
>M 500
M100 - M 150
M50 - M100
M30 - M50
<M30


Rural - Willingness to Pay for Connection
70
60
50
40
30
20
10
0
> M2000
M1500 - M 2000
M1000 - M1500
M500 - M1000
< M500


Rural - Willingness to Pay Monthly
80
70
60
50
40
30
20
10
0
M30 - M50
M20 - M30
M10 - M20
M5 - M10


Rural - Willingness to Work
70
60
50
40
30
20
10
0
6 days
5 days
4 days
3 days
2 days
1 days

Annex F: List of Documentation

Ref #	Title	Date	Author
1	Lesotho Water and Sanitation Policy	February 2007	Government of Lesotho
2	After Care Strategy, Final	December 2005	Department of Rural Water Supply
3	Final Report on Tariff Policy	March 2007	TAHAL Consulting Engineers Ltd.
4	Draft IWRM Strategy for Lesotho	2007	Ministry of Natural Resources, SWECO Grøner & WL Delft Hydraulics
5	Performance agreement between the government of Lesotho and water and sewerage authority (WASA) (final	September 2004	Government of Lesotho – Water Sector Improvement Project
6	Corporate plan, April 01, 2004 – March 31, 2009, Volume 1, (Revised Version)	20 October 2005	Corporate Planning Unit, WASA
7	Strategic Plan, April 01, 2009 – March 31, 2012, Volume 1 (Final Version)	14 October 2008	Strategic Planning & Analysis Unit, WASA
8	Annual Business Plan, April 01, 2008 – March 31, 2009, Corporate Plan Volume 2 (Final Version)	April 2008	Strategic Planning & Analysis Unit, WASA
9	Annual business plan, April 01, 2007 – march 31, 2008, Corporate plan volume 2 (Final Version)	30 January 2007	WASA
10	WASA, Annual Report 2006/07	2007	WASA
11	WASA Financial Model, V 24	12 September 2008	WASA
12	Final Lesotho Lowlands Bulk Water Supply Schemes, Final Design Reports part A to H + annexes	October 2008	Government of Lesotho/ Lowlands Water Joint Venture: SSI - DHV - J&G - FICHTNER – GWC
13	Final National Water Sector Information Management System Report	October 2008	Government of Lesotho/ Intermap
14	Lesotho: Water Sector Improvement Project, Phase 2: Metolong Dam and Water Supply Project, Preparation Mission – Draft Aide Memoire,	September 5-18, 2007	World Bank
15	Identification Fiche for Sector Policy Support	2008	European Commission
16	Rural Water Supply Planning Framework, District Information System (Excel tools)	October 2008	Department of Rural Water Supply
17	Development of Planning Framework for Rural Water Supply and Sanitation in	January 2007	Department of Rural Water Supply

	sotho, Proposal to the African Water Facility		
18	Proposal for funding for the Rural Water and Sanitation Sub-sector from the Millennium Challenge Corporation	July 2004	Department of Rural Water Supply
19	Proposal for Millennium Challenge Account Assistance, Water and Sanitation Sector Project	October 2004	Government of Lesotho, Ministry of Natural Resources, Office of the Commissioner of Water
20	DRWS Design Standards	April 2005	Department of Rural Water Supply
21	Assessing Unit Costs for Water Supply and Sanitation Services in Kenya	December 2005	WSP, Ministry of Water and Irrigation/ PEMconsult
22	Conceptual Planning and Costing of Community Water Supply Schemes, User Guide and Reference Manual	November 1998	Department of Water Affairs and Forestry, South Africa
23	Cost benchmarks, Water Supply Development Projects, A guide for Local Authorities,	January 2000	Department of Water Affairs and Forestry, South Africa
24	FEASIBLE User Manual A1 to A6 & FEASIBLE Expenditure functions and guidelines	November 2005	COWI
25	SWIFT Model (Excel Tools)	February 2007	Water and Sanitation Programme, Nairobi (WSP)
26	2001 Lesotho Demographic Survey, Analytic Report Volume I	December 2002	Government of Lesotho, Bureau of Statistics
27	Background to the 2008/098 Budget: a Review of Economic Performance 2001 – 2006; Economic Prospects, 2007 – 2011 and Medium Term Fiscal Framework, 2008/09 – 2010/11	March 2008	Ministry of Finance and Development Planning
28	MTEF Process – Steps to be followed	2008	Ministry of Finance and Development Planning
29	Migration in Southern Africa - Migration Management Initiatives for SADC Member States. Occasional Paper 157 , Roundtable Dialogue on Human Security and Migration in Southern Africa, hosted by the Institute for Security Studies and the South African Department of Home Affairs in Pretoria, South Africa, on 25 July 2007	December 2007	John O Oucho, Centre for Research in Ethnic Relations, University of Warwick, Coventry
30	Lesotho: Will the Enclave Empty?	September 2004	Jim Cobbe, Professor of Economics and Chair of the Department of Economics at Florida State University. NUL 1973-1976 and 1981-1982

31	Human Development Report, Lesotho	2009	
32	Baseline Data Study – Performance Agreement for Water Sector Improvement Project, Final Report	9 February 2004	Africon
33	Six Towns Water Supply, Project No 8.ACP.LSO.017: Design of Phase II, June 2004 Hydrological investigation, Morija Design Report, Sanitation Design Reports Maputsoe, Quthing, Teyateyaneng, Roma, Mapoteng, Morija	2004	CES
34	Feasibility study reports for 5 towns: Botha Bothe, Hlotse, Mafeteng, Mohale's Hoek, Qacha's Nek	2007	GIBBS Africa
35	WASA Infrastructure Master Plan Proposed Capital Investment Programme	June 1996	BKS Incorporated with Groundwater consultants
36			
37			
38			
39			

Annex G: List of Persons Met

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Annex H: Maps of WASA Supply Areas