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Challenges and Trade Offs in Private Investment in the South African Water Sector

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A research report submitted to the Faculty of Commerce, Law and Management, University of the Witwatersrand, in partial fulfilment of the requirements for the degree of Master of Business Administration

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ABSTRACT

SA is a water-stressed country that suffers from poor water service delivery. Half of the country's 48 million people do not have piped water access. The major problems are inefficient operations, lack of capacity in spending allocated budgets in rural municipalities particularly, unclear management structure, and a decline in capital expenditure. Private investment, driven by profit-seeking behaviour, would bring good fiscal control and efficient structure and, hence, would assist the water sector with the poor service delivery. However since water is essential for humans it can be seen as a social good. Government has instituted social goals for the equitable distribution of water using legislation.

The purpose of this work was to explore the potential trade-off between economic and social goals in private sector investment in the South African water sector. A qualitative method was used for analysis. Qualitative data was collected through interviews with personnel from the Sembcorp Silulumanzi concession in Mbombela and the municipality.

The study concludes that private investment has enhanced service delivery by improving efficiency, technical skills and the capacity to spend allocated budgets. Private investment in the water sector has no negative impact on equitable water distribution, to the rural poor particularly.

Rural areas with low population density and low cost recovery present a challenge. Private investment is recommended for the water sector, however an owners' engineer is recommended to support the CMU in managing the concessionaire.

DECLARATION

I, Sugen Chetty, declare that this research report is my own work except where indicated in the references and acknowledgements. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in this or any other university.

Sugen Chetty

Signed at ……

On the …….. day of …… 2012

DEDICATION

This is dedicated to my late father Mr Val Chetty who always encouraged me to study.

ACKNOWLEDGEMENTS

I would to thank my supervisor Professor John Luiz for his assistance in this study.

I would to like to acknowledge Peter Morota who was instrumental in setting up interviews for Mbombela Municipality, and all respondents from the Mbombela Concession (Sembcorp Silulumanzi) who gave up their time for the interviews.

I would like to thank my previous employer Foster Wheeler and my current employer Lurgi for allowing me to complete my master's degree while in full time employment.

Last, but not least, I will like to thank my family and friends for allowing me to be "missing in action" for most of the social events during the final writing up of this dissertation. I am looking forward to being back with you all.

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CHAPTER 1: INTRODUCTION

1.1 Purpose of the study

The purpose of this research is to explore the potential trade-off between economic and social goals in private sector investment in the South African water sector.

1.2 Context of the study

South Africa (SA) is located on the southern tip of Africa with neighbours Botswana, Zimbabwe, Namibia and Mozambique. With a producer price parity gross national income per capita of $9780/capita (World Bank 2010), an established democracy with leading macro policy and the most developed infrastructure on the continent, SA is the clear financial and industrial leader in Africa (Civit 2009).

Geographically SA has an area of 1.2 million km^2 with rainfall of 450 mm/yr that is half the world average of 860 mm/yr and is, therefore, classified as semi-arid. SA is in the process of upgrading the country's infrastructure, particularly electricity and water (DBSA 2006, Civit 2009). However in the water sector there are issues of poor governance, and a lack of capacity in terms of technical and management skills leading to poor service delivery (Buhl-Nielsen 2001; Estache and Kouassi 2002; Magadlela and Mdzeke 2004) that will constrain infrastructure development.

Private business can potentially improve service delivery. Given the nature of business, private enterprise is characterised by higher efficiency and governance than public enterprise due to profit seeking. As water has no substitute there exists the opportunity for annuity income with the right investment and potential private public partnerships (PPP). Water has become a scarce resource, causing a reclassification from a social good to an economic

good. However the social aspects of water cannot be escaped. One example is the link between water and health in the spread of disease, such as cholera. In addition, private enterprise would prefer to invest in high density areas for economies of scale which would leave lower density rural areas under-supplied. Hence a trade-off is foreseen in using private investment for improving the service delivery of water.

1.3 Problem statement

1.3.1 Main problem

Evaluate the suitability of private business investment in the SA water sector.

1.3.2 Sub-problems

The first sub-problem is to assess the business case for private investment in the SA water sector.

The second sub-problem is to ascertain how private investment may impact on social goals in the SA water sector.

1.4 Significance of the study

Water is vital to nutrition and health and humans would not survive without it. Water is not substitutable and an equitable distribution is socially important. The social goal of government is to ensure basic water service delivery to the entire SA population.

Government has allocated funds to improve the infrastructure and service delivery (DWAF 2012). It was estimated that R9 billion must be invested in the water sector by 2012 (Civit 2009). Government has governance and capacity issues that could be mitigated by the involvement of private enterprise. The number of water and sanitation projects with private partners in developing

countries has increased significantly over the last 15 to 20 years (Bakker 2003, IEG World Bank 2010).

With the downturn in world economic activity, high returns on investment are scarce. Investment in developing nations is a potential source of higher returns, particularly in Africa (Honey, 2003). The SA Water Sector is an attractive investment: it has a market value of $2 billion - where 72.6% of the revenue is generated by domestic sales of potable water (Datamonitor 2009), a non-substitutable product - and it is a potential gateway into Africa.

Private business, however, is likely to target maximum profits which could compromise social goals. This study explores the trade-off between private business investing in the water sector to maximise returns and the social goals of equitable water distribution.

1.5 Delimitations of the study

The different goals of government and civil society (Waddell, 2000) are not explored in this work. Government and civil society are treated as one entity. The focus is maintained on business goals versus social goals in the water sector.

Private investment in water supply to business users is not included.

1.6 Acronyms

The following acronyms are used in this report:

BOTT	Build, Own, Train, Transfer
CAPEX	Capital Expenditure (for projects)
CMA	Catchment Management Area
CMU	Concession Monitoring Unit

CSIR	Council of Science and Industrial Research
DWAF	Department of Water Affairs and Forestry
FBW	Free Basic Water Act of 2001(6kL/month/household free water)
kL	kilo (thousand) litres
HSRC	Human Sciences Research Council
lpppd	litres (of water) per person per day
ISD	Institutional and Social Development
NWA	National Water Act of 1998
OPEX	Operating Expenditure (day to day)
PPI	Private Participation in Infrastructure Project Database
PPIS	Private Participation in Infrastructure Services Database
PPP	Public Private Participation
RDP	Reconstruction and Development Programme
SAHRC	South African Human Rights Commission
WHO	World Health Organisation
WISA	Water Institute of South Africa
WSP	Water Service Providers
WSA	Water Services Act of 1997
WSLG	Water Sector Leadership Group

1.7 Definition of terms

For water flow **cubic metres per year** is used and abbreviated as m^3/yr. Where an alternate unit is directly referenced, it will be expressed in m^3/yr, where appropriate. Similarly, all **volume cubic meters** shall be abbreviated as m^3 (1 m^3 = 1kL = 1000 litres; litres are commonly abbreviated as l/L).

1.8 Assumptions

It is assumed that the interviewees are honest in their responses.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

Water is a non-substitutable fluid that is crucial for human survival. Potable water supply has been characterised by public supply with some tendency towards private provision since the early 1990's. The literature review explores key themes to the study and ends with an overview of pertinent issues.

2.2 Theory of private provision of a public good

Is water a public good? Mohr and Fourie (2008) define a public good as a good that is used by the community or society at large where consumption by individuals cannot be excluded. Similarly Gruber (2007) defines a pure public goods are non-rival in consumption (one person consuming it does not affect another's opportunity to consume it) and non-excludable (an individual's right cannot be denied by another). Raw water found in rivers and lakes is an impure public good since it satisfies the two criteria to some extent. It is present in large supply and it is difficult to exclude its use. Potable water is collected raw water, from rivers, lakes and rain-runoff than has been purified for consumption and fed into homes via a reticulation system. Potable water in this scenario is not a public good but a private good since it can be excluded and individuals can affect another's right to consume it (any open tap affects the line pressure and therefore distribution). Although water has been classified as a public good (Buhl-Nielsen 2001; Mehta 2003; Tanka and Fuller 2010) no real distinction between raw and potable water has been made. When water goes from raw to potable it turns from an impure public good into a private good.

For private goods optimal provision occurs when the marginal cost equals the marginal benefit to the consumer, whereas for public goods the optimal provision is the point where the sum of all marginal benefits across all recipients

equals the marginal cost (Gruber 2007). Hence public provision of water appears to be the solution. Government may also determine optimal provision and either provide it or mandate the private sector to provide it. However, public provision of the public good faces three problems: crowding out private provision, funding costs and benefits of public projects, and reflecting the public's demand of a public good (Gruber 2007).

Private investment is unlikely to provide enough of a public good due to the free rider problem, which is when individuals do not contribute towards a common benefit. Private investment can partially overcome this issue when they are individuals with high income or high demand of the public good, individuals who are altruistic and individuals who get satisfaction from their contributions (Gruber 2007). In the context of water, there appears to be potential for these conditions to hold. Higher water users will demand more of the good and the concept of public entrepreneurship is not uncommon.

McGahan, Klein, Mahoney and Pitelis (2009) argue that the benefit of public-private interactions is their capacity to innovate in the public interest, particularly where policy is implemented without the lowest cost leaving a gap for entrepreneurship to create value. The authors further state that the growth of privatisation for the public interest is dependent on the resolution of public concerns, the development of public sector institutions and the better performance of a private company over the public sector in satisfying public interest. However determining public interest is difficult since the alignment of individual objectives is complex, individual interests are multifaceted and public interests are constantly changing (Buhl-Nielsen 2001; McGahan et al 2009).

Raw water is a public good and potable water is closer to an economic good due to rival-use and the ability for it to be excluded. Even with water taken as an impure social good, there is a theoretical case for the private provision of water. The key theoretical argument against this is that private investment will under-provide water.

2.3 International experience of private investment in water

The number of privately invested water and sewerage projects nearing financial closure has increased from 2 in 1987 to 183 in 2000. By 2010, the number had grown to 1 057 for water supply and sanitation (IEG World Bank 2010). Most of the projects are on an urban area concession basis (Marin 2009) in which a private company has exclusive rights to operate the water supply for a fixed period (normally 25-30 years). Figure 1 from Marin (2009) highlights the increasing number of water contracts awarded to private companies or PPP's in

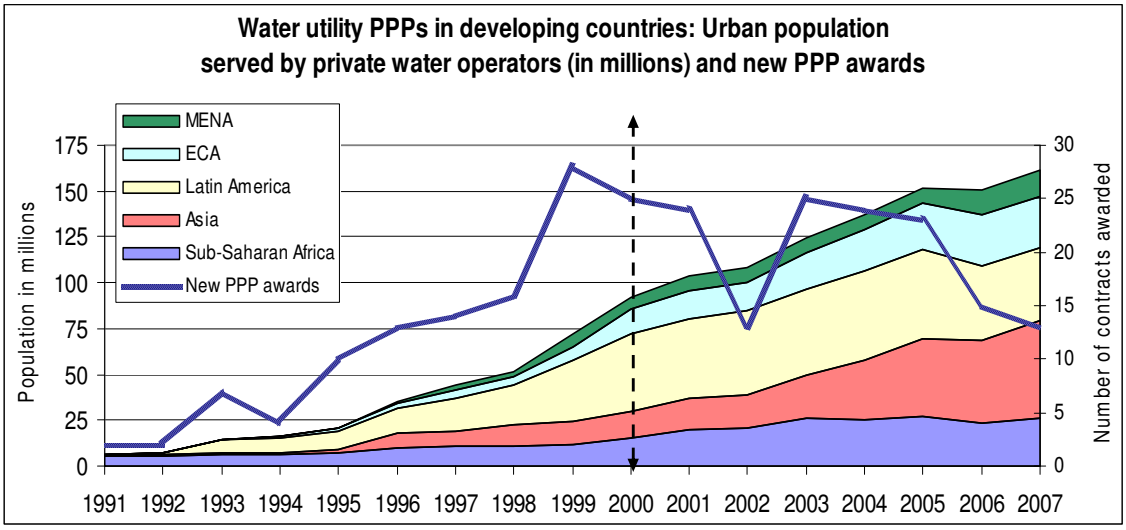


Figure 1: Population served by urban water PPP's

developing nations. The axis on the right hand scale indicates the number of water utility PPP contracts awarded each year. On a cumulative basis the population served by private investment is increasing. However, the number of new PPP's peaked in 1999 and has since been declining.

Bakker (2003) submits that in the last two decades, there has been a movement towards privatisation in the global south (the nations of Africa, Central and Latin America, and most of Asia). Experience in Latin America and Africa was further probed since Latin America has many reported case studies and Africa was able to provide a valuable context for the South African experience.

2.3.1 Experience in Latin America

In Latin America there has been a history of mainly 30-year concessions from as early as 1990; in Argentina, Brazil, Bolivia, Chile, Columbia, Honduras, Mexico, Trinidad and Tabago. In terms of water utility privatisation Estache, Gomez-Lobo and Leipziger (2001:1179) call Latin America "a laboratory of privatisation".

Positive experience of private investment has been reported. Of the 16 published case studies summarised in Clarke, Kosec and Wallsten (2009), 12 are given a positive assessment. PPP's in Columbia, Brazil, Argentina and Manila have performed well in urban areas (Marin 2009) by expanding access to piped water supply. Privately run management contracts in Guyana, Trinidad and Tobago have helped to improve collection rates in urban areas. Concessions with targeted public grants in Colombia and Guayaquil have achieved remarkable success and have improved service delivery to the poor (Marin 2009).

However, mixed performance has been reported in terms of service delivery to the poor (Clarke et al 2009; Iimi 2008; Wilder and Lankao 2006) although evidence for this is limited and anecdotal. High price tariff spikes in Cochababba (Bolivia), for example, even with paying consumers, caused a contract cancellation (Clarke et al 2009; Estache et al 2001). PPP's were associated with significant employee layoffs: in Cartagena (Colombia) for example, a 65% reduction was recorded between 1995 and 1997 (Marin 2009). Wilder and Lankao (2006) regard water privatisation in Mexico as achieving little improvement in efficiency and merely being a mechanism to transfer public assets into private hands to allow less government control.

A lack of competition at the bidding stages is postulated as a cause for mixed PPP performance. In Latin America there are, on average, 2.2 bidders per water PPP auction and they usually include only large MNC's such as SUEZ, AGUAS DE BARCELONA and VEOLIA (former Vivendi Environment) due to

restrictive bidding criteria (Iimi 2008). Marin (2009) submits that PPP activity was not dominated by a few MNC's, a view supported by Swyngedouw (2010). Global Water Mandarins from were summarised in Table 1 using data from Swyngedouw (2010) and showed that there are more than a few major players based in Europe. Iimi (2008) highlighted that large MNC's can potentially use local partnerships to disguise their involvement.

Table 1: Global Water Mandarins

Company (water subsidiary)	Base Country	People served with water (millions)	Water Business Revenue (Billion EURO)	Total Revenue (Billion EURO)
Vivendi	France	110	12.8	26.48
Suez (Ondeo)	France	115	10.1	42.36
Bouygues (SAUR)	France	30	2.5	20.5
RWE (Thames Water)	Germany	43	1.69	62.9
American Water Works	US	10	1.44	1.44
Anglican Water Group	UK	4.1	0.892	1.29
Severn Trent	UK	8	0.887	1.68
Kelda Group (Yorkshire Water)	UK	4.5	0.62	0.775
United Utilities	UK	7	0.2	1.78
TOTAL		**331.6**	**31.129**	

Iimi (2008) recommends the use of adequate scale to ensure effective competition in the bidding process. He cites Buenos Aires as an example of a diseconomy of scale: one 30-year contract was awarded for the whole city of 8.7 million people as opposed to Mexico City where the 8.4 million user base was split into four areas, each with its own contract.

Marin (2009) cites direct financing by private operators as a reason for mixed PPP performance and recommends private operation with public or hybrid financing. Estache (2001) argues that privatisation does not negatively affect the poor and submits that strong regulatory control of the private concessionaire was a key element in improved service to the poor.

2.3.2 Experience in Africa

In Africa during the period 1990-2002, there were 14 private water supply projects in Sub-Saharan Africa and 7 such projects in North Africa and Middle East combined (Kirkpatrick, Parker and Xhang 2006). The chronological order of private water sector investment in individual African countries was Ivory Coast (in 1998), followed by Guinea, South Africa, Gambia, Senegal and Gabon (Clarke et al 2008).

African case studies summarised in Clarke et al (2009) describe three positive case studies, two that were mixed and one that was negative in the period up to 2000. This shows some potential benefit in private investment. Kirkpatrick et al (2006) agree with this potential benefit, but found no significant difference between public and private provision of water in Africa except that the use of private operators can lead to higher water tariffs and more water metering.

Further mixed performance of PPP's in Africa is highlighted by Marin (2009) who reviewed urban water utilities in developing countries. He gives PPP's in Ivory Coast, Morocco and Senegal a positive report card but notes negative outcomes in Maputo, Mali, Chad, Dar Es Salaam, Uganda and Jordan.

In the Ivory Coast piped water supply in terms of total connections virtually doubled in a decade of private operation (Marin 2009) as shown in Figure 2. The secondary axis "% coverage" indicates the percentage households that were given water supply. Use of a private company may be due to the French occupation of Ivory Coast since this is a common model in France (Kirkpatrick et al 2006). Morocco has had four large cities supplied with water through

private investment and has performed well in terms of quantity and quality of potable water (Tortajada 2003). Water losses in Morocco were reduced under private concessions at a faster rate than public municipalities (Marin 2009). Marin (2009) reports an improvement in collection rates in management contracts in Zambia and Johannesburg. In Chile full cost recovery is used in the PPP involving SUEZ. The cost of water is the same for all but poor people get a partial discount by way of stamps for redemption against their bill (Bakker 2003; Economist 2010).

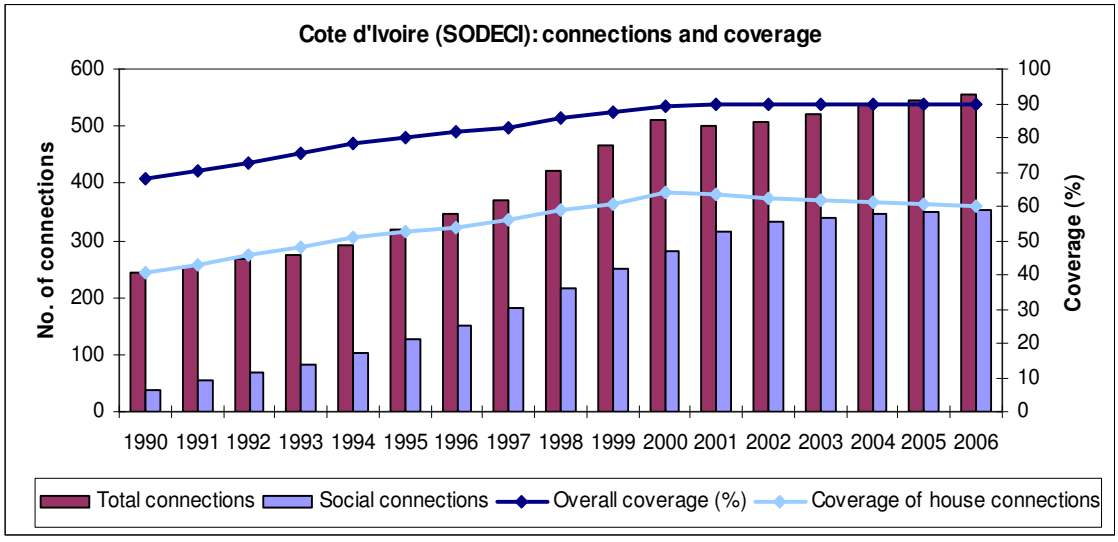


Figure 2: Ivory Coast historic water service coverage

Clarke, Menard and Zuluaga (2002) report positive results of privatisation in Guinea: a significant improvement in water services and quality, and a modest improvement in coverage. They also note that high income users were more likely to have access to the piped system due to high connection costs. In this case, the balance between improving service delivery without compromising the needs of the poor had not been met. Remaining key problems in Guinea were high unaccounted for water, low connection rates, poor collection and high water tariffs (Clarke et al 2002).

Marin (2009) identifies the cancellation of concessions in Mali, Chad, Tanzania, Uganda and Jordan and a reversion to public management. A concession in

Gambia was cancelled after implementation (Clarke et al 2008). Marin (2009) further observes that 50% of all water PPP's cancelled were in Africa. Based on case studies in Ghana, Tanzania, Zambia and Namibia, Loftus (2009) comments that water privatisation in SADC seems to be unsuitable since private investors have been unwilling to take on long-term risk.

Carvalho, Carden and Armitage (2009) compare private company Adem's involvement with water supply in Maputo (Mozambique) to that of public ownership in Hermanus, a coastal town in Western Cape, South Africa. Adem, which handles a part of the informal city in Maputo and other small scale water, is not performing well in comparison to Hermanus in terms of sustainability. The authors put the difference down to different levels of service provision, relative economic performance and the political environment. Gumbo, Juizo and van der Zaag (2000) mention that the supply in Maputo was characterised by water losses, 6 000 illegal connections and intermittent water supply. This highlights the difficulty in directly comparing public to private water operation: when other social, economic and political factors cloud the issue it is harder to determine whether water service delivery is successful or not.

Estache and Kouassi (2002) analysed efficiencies in the African water sector based on a sample of 21 countries from 1995 to 1997. During this period private sector participation was limited. Estache and Kouassi (2002) conclude that the African water sector has low technical efficiency and that poor governance and institutional weaknesses add additional cost to service delivery. Bradley and Ngbichi (2006) highlight similar problems in West African countries where, in spite of resources, they still suffer from political instability, social problems, poor infrastructure and the strong influence of the United Kingdom and France, their former colonial powers, who deter Foreign Direct Investment (FDI) from other countries. Based on case studies in Zimbabwe, Mozambique and Namibia, Gumbo et al (2003) blame the absence of proper information systems and technology within urban water utilities as part of the cause of poor service delivery.

Africa is characterised by the mixed performance of private investment. The balance of improving service delivery by improving efficiency without compromising the right of the poor to water has not been realised. Clearly service delivery is not only dependant on whether water provision is through private or public provision.

2.3.3 Experience in South Africa

In the 1990's privatisation of SA water had begun (Narsiah 2008). South Africa has had private investment in Queenstown (1992), Johannesburg, Durban and Nelspruit.

a. Johannesburg

In 2002, Johannesburg Water (Pty) Ltd was created independently with the city as a shareholder. A management contract was awarded to a consortium lead by French-based MNC SUEZ Group (Swyngedouw 2010).

Harvey (2003) highlights the difficulty of getting contractual information from Jo'burg Water and suggests that moving from a public entity to private ownership worsened the lack of transparency. He also notes that there has been little or no genuinely independent effective regulation and monitoring at all levels.

In 2003, operation Gcin' Amanzi (which means 'save water' in Zulu) was launched by Johannesburg Water to install prepaid meters in Soweto, prompted by a cost recovery model. In November 2004, the prepaid meters were ripped out by consumers in protest and a march against the prepaid meter system occurred in Johannesburg (Von Schnitzler 2008). One of the key issues that caused the protest was that the prepaid meters only dispensed the free 6kL/month per household if the household water account was not in arrears (Swyngedouw 2010).

Woghiren (2005) in a case study on Jo'burg Water highlights that water data is inadequate, incomplete and not up to date. As an example he reports that of the 350,000 calls a month to Jo'burg Water less than 20,000 were being processed.

b. Nelspruit

In 1999 an agreement was reached with British Biwater to provide water services for 30 years on behalf of the Nelspruit Local Authority. This arrangement was the first concession contract of its kind in South Africa (Smith, Gillet, Mottiar and White 2005).

Smith et al (2005) identify the following post-concession successes with British Biwater's involvement in the Nelspruit area:

- The level and quality of township service delivery increased.
- R40.5 million was spent to improve infrastructure.
- 1 268 temporary jobs were created along with 47 contracts to local contractors.
- Communication with communities improved.
- Outstanding balances were frozen to encourage payment.

Bender and Gibson (2010) also regard the concession as a success in terms of coverage, water quality, employee training and development.

In terms of negative experience, Vogt (2003) reports tariff increases of 400% due to the concession, however published tariff data does not support this (Bender and Gibson 2010, Smith et al 2005). The concession had not delivered a 24-hour supply to rural households and the risk allocation in terms of the investment of concession funds had been beneficially negotiated after the contract was awarded (Bender and Gibson 2010). In addition, the concessionaire was hesitant to extend the concession to areas with poor cost recovery (Smith et al 2005). This is a valid business concern, but in direct opposition to the government's social goals of service delivery. Furthermore, the Compliance Monitoring Unit (CMU) set up to regulate the concession was not

functioning (Smith et al 2005; Bender and Gibson 2010). This was also reported by Harvey (2003) for Jo'burg Water. In addition, transparency was deemed to be an issue as well (Harvey, 2003). Smith (2005) also reports that the concessionaire had used strong arm tactics (disconnections and late fees) for non-payment, albeit unsuccessfully. The Mbombela Authority thus regarded the concession as a failure but the municipality could not step back in because of a lack of physical and financial capacity and political will (Smith et al 2005).

c. Queenstown

In 1992 a management contract with French MNC SUEZ Lyonnaise des Eaux was started in Queenstown, East London. The performance of Queenstown concession was reported as mixed but with modest improvements in Clarke et al (2009). Further contracts were started in Stutterheim and Fort Beaufort with the same concessionaire. Narsiah (2008) submits that the record of privatisation has been poor particularly in disadvantaged communities and the full cost recovery strategy caused service-cut-offs due to non-payment. Given that the concession was awarded during apartheid South Africa, this is plausible and could explain the large number of service cut-offs in South Africa, estimated at 10 million households (Francis 2005; Vogt 2003). Francis (2005) argues that privatisation has been used to maintain apartheid service delivery - preferential supply to higher income users - well into South Africa's democracy.

d. Durban

Durban municipality received investment from Vivendi General de Eaux for the Durban Recycling project, where waste water was reclaimed and supplied to business clients Mondi and SAPREF (Narsiah 2008). Since there was no domestic water supply the case was not relevant to this study.

2.4 South African Water Sector

In a similar way to that of the overall African experience, delivery in water supply has often been dependent on factors other than whether service provision was public or private. This section describes key themes in the South African water sector.

2.4.1 Semi-Arid and Water Mismatch

SA has an annual rainfall of 450 mm/yr that is almost half the world average of 860 mm/yr, classifying SA as a semi-arid land (DBSA 2006; De Villiers Mwendera, Hazelton, Nkhuwa, Robinson, Tijijenda and Chavula 2003). In addition, a high evapotranspiration rate of 600-900 mm/yr means that approximately 92% of the rain water that falls onto the ground evaporates back into the atmosphere (Rockström 2000). Furthermore, 80% of the rain falls in the six summer months (DBSA, 2006; Winter 2001). Clearly SA is a water-stressed country.

The population and industrial concentration has created a mismatch between supply and demand locations. Higher average rainfall is prevalent in the Kwa-Zulu Natal area. However, high water demand occurs in the Gauteng region with higher population density and large industrial users. Gauteng is the smallest province in SA, but has the highest concentration of people. Water has to be piped in to satisfy demand. Therefore the transportation of water is a major issue (Mwendera, Hazelton, Nkhuwa, Robinson, Tijijenda and Chavula (2003). De Villiers et al (1996) also raise the issue of disproportionate geographic distribution relative to demand and recommend proper management of the small supply. South Africa's population growth (World Bank 2010) and increasing industrial demand for water (Van Zyl 2007) further exacerbate the problem.

2.4.2 Water Service Coverage

The total population of SA supplied with piped water in 2006 was 24.2 million, which was less than half the population of SA (DBSA, 2006). Figure 3 extracted from DBSA (2006) shows that even the wealthy province of Gauteng has poor water service delivery: there are between 2 200 and 30 200 households in the City of Johannesburg, Ekurhuleni Metropolis and City and Tshwane without piped water access. Basic water access which includes intermittent access has improved from 66% in 1999 to 88% in 2009 (Bender and Gibson 2010).

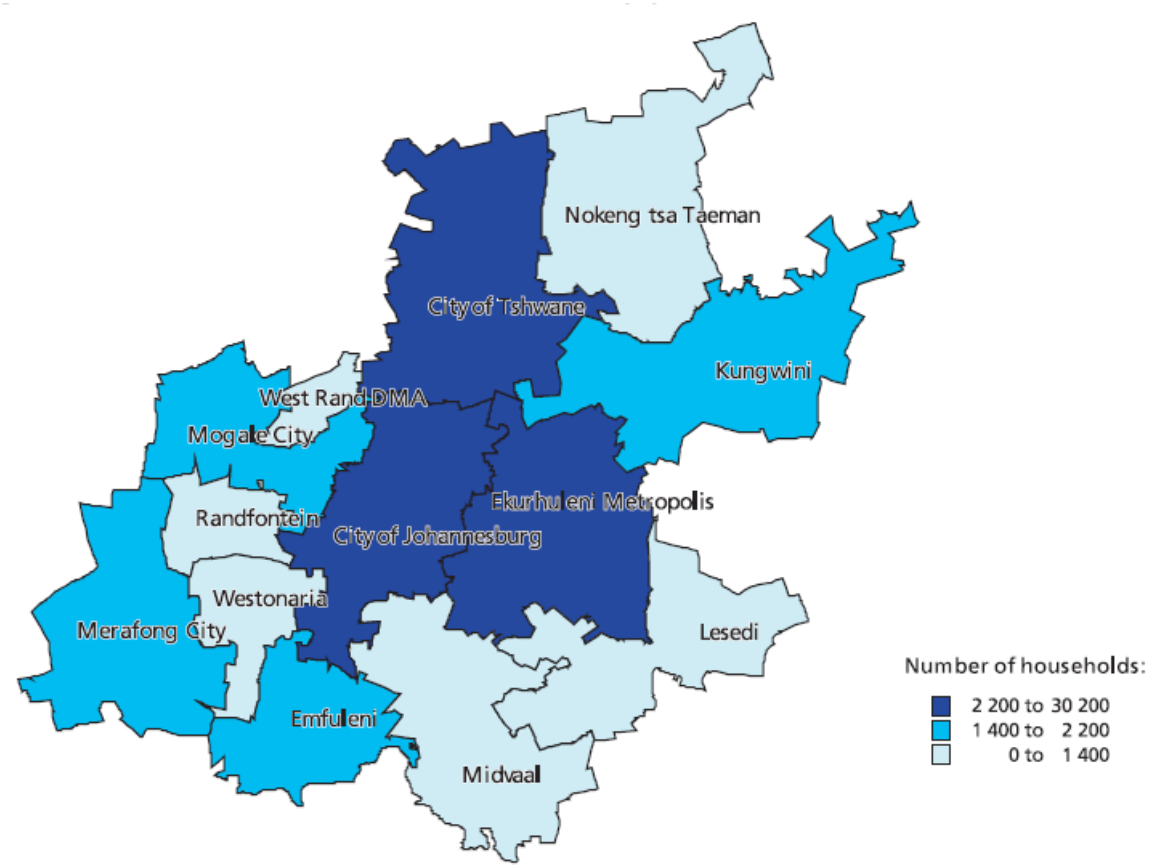


Figure 3: Households with no piped supply in Gauteng Province

2.4.3 Water Quality

Water quality is an industry problem, particularly an indication of the water treatment plant performance. However, poor water quality has had dire social

consequences in South Africa. In early 2008, 80 children died of diarrhoea after drinking dirty tap water in the Ukhahlamba district municipality (Mpofu 2008). It is reported that 89% of people who extracted water from rivers did not treat it (Francis, 2005). Haffajee (1999) reports an incident of a women killed by crocodiles while fetching water in a Kwa-Zulu Natal township and further highlights the difference between rural and urban water infrastructure. Swyngedouw (2010) argues that insufficient access to potable water causes premature death, ill-health and reduced life expectancy.

The Development Bank noted that 63% of municipalities could not prove that they achieved the water quality standard of SANS 241 in 2005 and many water treatment plants in Gauteng were non-compliant (DBSA 2006). Newmarch (2010) points out that less than 43% of municipalities monitored water quality in 2005. Nzimakwe (2009) notes that only 43% of local water service authorities in SA complied with government standards for drinking water quality in 2003/4. His data is shown in Table 2 with distribution in each of the provinces.

A possible explanation related to the state of treatment plants. Fifty percent of treatment plants in the 'homelands' were constructed in the 1980's, 33% in the 1960's and 1970's. Of these, 31% are in good working order and 51% in average working order. Daily monitoring of water quality took place in 42% of these whereas 25% never monitored water quality (DBSA 2006). Clearly the state of water treatment plants in South Africa was poor and contributed to the poor water quality overall.

Table 2: Estimated Local Municipalities with acceptable quality

Province	Total no of LMs	No of LMs complying	Percentage
Eastern Cape	25	5	20%
Free State	7	3	43%
Gauteng	9	5	56%
KwaZulu-Natal	34	13	38%
Mpumalanga	15	4	27%
Northern Cape	19	7	37%
Limpopo	14	7	50%
North West	11	8	73%
Western Cape	21	14	67%
South Africa	**155**	**66**	**43%**

Source: SAHRC Report (2006, 109)

2.4.4 Industry Structure

The water sector is divided into water resources and water services. Water resources deal with infrastructure whereas water services deal with water supply services (water from extraction to consumer) and sanitation services (household effluents including sewage and industrial wastewater). Major stakeholders are

- the regulatory Department of Water Affairs and Forestry (DWAF),
- the Water Service Providers (WSP): the municipalities and the water boards,
- the research institutions: the Water Research Commission(WRC) and the Council for Science and Industrial Research (CSIR),
- the South African Local Government Association (SALGA), and
- the Department of Co-operative Governance and Traditional Affairs and
- the communities (DBSA 2006).

In terms of the water supply chain, the Water Services Authority (WSA) is constitutionally responsible for the provision of water services. DWAF is the sector leader, supporter and regulator and is responsible for the management of

bulk water facilities, dams and canals. DWAF is decentralized into Catchment Management Areas (CMA's). Most towns arrange their own bulk supply. Water boards can also manage the bulk supply for multiple towns together. The water services act separately in terms of WSA and Water Service Provider (WSP) which can be the municipality or water board or private sector. Recently the power of a WSA was allocated to local municipality (Category B).

Management by local government is the dominant form of water supply management (Buhl-Nielsen 2001). Clearly actual water service delivery to consumers is the responsibility of the municipality; however they are reliant on upstream suppliers for raw water and information (Smulders 2008). Francis (2005) reports that government is slowly transferring power from DWAF to local government for collection of water payment in order to finance local operations. Government-managed local supply can sub-contract the water supply to the private sector.

From an international perspective, Datamonitor (2009) identified the following key points of the SA water sector:

- The SA water utility sector generated revenues of US $ 2.093 billion in 2008 with a compound annual growth of 3.2% from 2004 to 2008.
- Domestic sales dominated at 72.6% of revenues, agriculture at 19.8% and industrial at 7.6%.
- Water utility companies have been moving towards a cost recovery model which implies steep tariff increases.
- Companies usually bid for geographic area supply to customers rather than bidding for end users.
- Deteriorating water infrastructure is a key driving force for privatisation.
- Public involvement in the water sector is high.
- There is a movement towards privatisation of the sector.

The balance of power is summarised in Figure 3 using Porter's Five Forces Model (Porter 2008) and data from Datamonitor (2009).

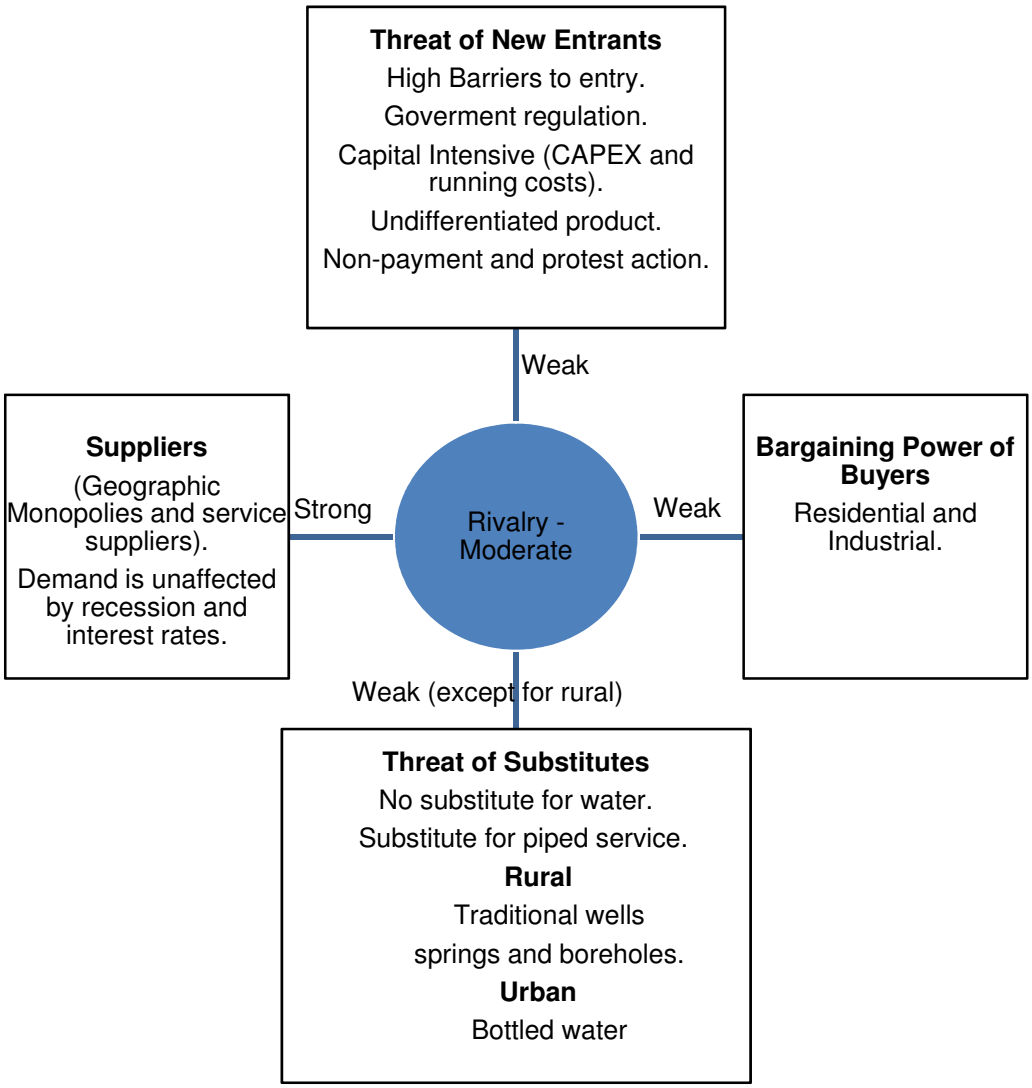


Figure 4: Porter's Five Forces Model

Suppliers have more bargaining power than buyers. Although buyers can use strike and protest action to make their voices heard, much of SA is not covered by water infrastructure indicating that their bargaining power is relatively weak.

In terms of major international players SUEZ, and Vivendi are both in the SA water sector but to a limited extent.

Datamonitor (2009) further predicts that the market will grow to $2.4 billion in 2013 and capacity from 16.2 km^3/yr (16.2 million m^3/yr) in 2008 to 16.7km^3/yr (16.7 million m^3/yr) in 2013. The stated capacity was off by a magnitude from that in DBSA (2006) of 1853 million m^3/ yr.

In summary, much of the function of water supply and infrastructure maintenance lies with the municipality (Smulders 2008; DBSA 2006). Having the municipality responsible for the infrastructure and water supply to users given the skills and capacity needed to execute this function could be challenging. In addition, the municipality relies on upstream structures including DWAF and water boards for raw water and information (Smulders 2008). There is also an increasing tendency to decentralise government functions which can place further strain on the municipality (Francis 2005).

2.4.5 CAPEX funding and capacity

With the high treatment and transport costs of water (dams, water treatment plants, pump stations, long runs of underground piping that require maintenance), capital expenditure is crucial.

In terms of public sector investment in water infrastructure capital investment has been declining (DBSA 2006, Harvey 2003, Narsiah 2008, Newmarch 2010B). Figure 4 extracted from DBSA (2006) further highlights this problem. The rapid decline in DWAF capital expenditure during the Apartheid era from around R240 million in 1982/3 to less than R50 million in 1992/3 (in 1982/3 Rands) highlights the potentially aging infrastructure problems (De Villiers et al 1996). Post 1996, municipalities targeted efficiencies but government funding to municipalities was cut by 85% from 1991 to 1997 leaving them with little option but to adopt stringent fiscal control and creating a space for privatisation

(Narsiah 2008). Umgeni Water, a state owned company, has reported some success in this regard (West 2010).

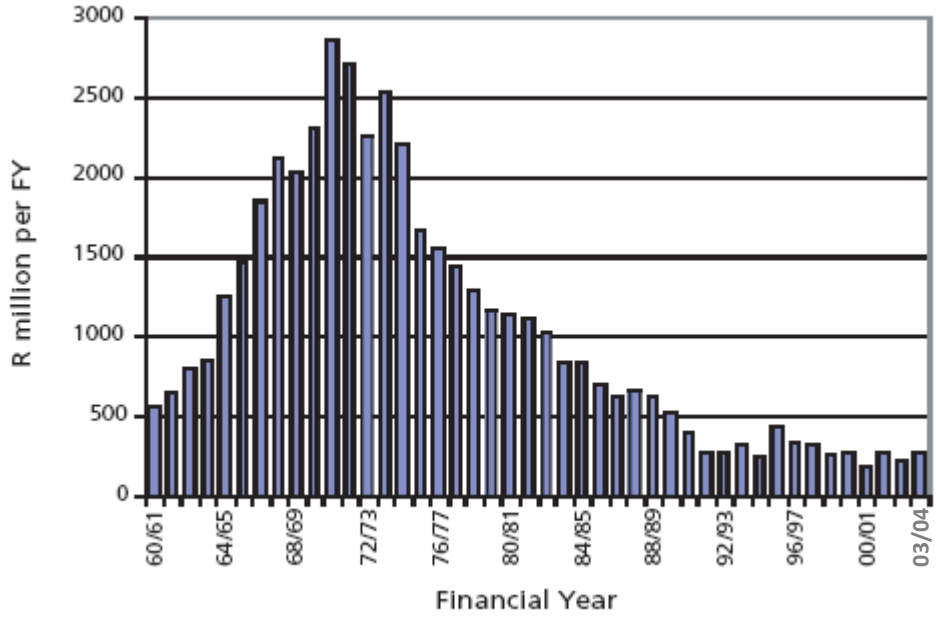


Figure 5: DWAF Capital Expenditure on water resources (in year 2000 Rands) for period 1960/61 to 2003/04

Civit (2009) estimated that a R9 billion investment in water storage is required by 2012. DWAF has reported plans in progress (DBSA 2006) as follows:

- 18 major projects planned in the next 21 years with a required investment of at least R21 billion.
- A planned decrease in water losses by 6 million m^3/yr,
- The eradication of invader plants to increase the water run-off into rivers and hence water capture
- The enlargement of the Mokole dam and an 84km pipeline to increase water transfer.

However capacity to spend allocated CAPEX is a potential issue. Apart from water boards, municipalities with enormous backlogs locally manage water supply. Municipalities outside the metropolitan area suffer from financial and manpower constraints (DBSA, 2006). Magadlela (2004) described the Working

for Water Programme launched in SA in 1995 to address invasive alien plants and contribute to social development. The work highlighted a lack of entrepreneurial skills. Although the programme was able to secure significant funding (R150 million in 1997/8) it lacked the capacity to spend it. These examples, though not specific to the water sector, highlight two ongoing critical problems to development in South Africa: inadequate entrepreneurial skills and the lack of public capacity to use available budgets.

Lack of public capacity to spend budgets is a serious problem particularly in rural municipalities (DBSA 2006; Buhl-Nielsen 2001). Ensor (2010) reports that of the 272 municipalities in South Africa, 51 spend less than 50% of their allocation of municipal infrastructure grants and 10% spend nothing at all. She further states that the rate of municipal grant expenditure has decreased from 85% in 2008-9 to 75% in 2009-10(R1,2 billion). District municipalities are also unable to access funding sufficiently compared to metropolitan municipalities (DBSA 2006). Umgeni Water CEO Mzimkulu Msiwa reports that some rural municipalities cannot generate even 5% of their operating costs (West, 2010).

2.4.6 Politicised Water

During apartheid there was disparity in water services. Water service delivery to high income users was disproportionately higher than that to low income users. Water had therefore become politicised. In the 1980's, non-payment was a means of boycott against the government and created a culture of non-payment (Schnitzler 2008). In 1988, after non-payment, water meters were no longer read and the councils stopped sending out bills to the townships. This caused service-cut-offs for non-payment. Low income users made use of "struggle plumbers" who illegally reconnected water pipes, eventually leading to large scale, unaccounted for water losses.

Post apartheid payment issues are still prevalent. Cost recovery particularly in rural or informal areas is a key problem. Cost recovery is estimated to be 60% in South Africa (McDonald 2002). Service cut-offs were estimated at 15 million

households in 2005 (Francis 2005). Illegal connections still contribute to unaccounted for water losses (Vogt 2003). In Soweto 70% of water bought from Rand Water was lost (Von Schnitzler 2008).

In an attempt to depoliticise water and educate consumers prepaid meters were installed in operation Gcin' Amanzi. However meters were removed and strike action against the municipality followed (Von Schnitzler 2008).

Alence (2002) rejects the non-payment culture and instead says that affordability is a key social issue with low income users who consume more than the free basic water allocation of 6kL/month/household and quickly become burdened by mounting debt estimated at three times their current payment. McDonald (2002) also supports this view. The rural or informal areas present the key challenge with low population density, longer water reticulation distances and poor cost recovery. McDonald (2002) estimates 6 million rural households without water services, 2 million people evicted due to non-payment of water and /or electricity, and notes instances where the water bill amounted to 25% of household income. Privatisation is not suited to rural areas with no wealthy customer base (Francis 2005). Narsiah (2008) further submits that with cost recovery the poor (with potentially higher consumption) will be subsidising the rich via the rising block tariff.

Pre- and post-apartheid governments prefer to privatise the supply of water. Narsiah (2008) submits that the SA apartheid government, with strong links to the pro-privatisation US, UK and World Bank, were also in favour of privatisation as a cash injection to pay off foreign debt estimated at R60 billion in 1989. Francis (2005) further argues that the post-apartheid SA government favoured privatisation due to austere neo-liberal politics aimed at having good macroeconomics for FDI. Harvey (2003) mentions that city leaders are on a path of neo-liberalism irrespective of the social consequences for the poor.

Politically, water provision can be a minefield for a private operator, particularly with low income users.

2.4.7 Government Social Goals

In 1994, the Reconstruction and Development Programme (RDP) was launched emphasizing the redistribution of municipal resources and provision for the poor. After1994, the government emphasized the need for communal taps within 200 m of all households. The objective for the next ten years was to increase water connections per household (Francis 2005).

In line with Africa's millennium goals of basic water access for all, the water ladder was planned for service delivery. The first rung is basic water to all and the second rung is a tap in each yard (DBSA 2006). Further rungs were not defined since the first two were never reached fully. For the purpose of this work the second rung of the water ladder is used for the social goal i.e. piped supply to the entire population.

The government's water objectives have been translated into policy as follows:

NWA The National Water Action of 1998 that is aimed at sustainable use.

WSA The Water Services Act of 1997 that governs the right to basic water supply.

National government is the custodian of water as per the National Water Act of 1998 (NWA). Water rights are separate from land ownership. This has changed from that reported in Buhl-Nielsen (2001) when water rights were loosely defined and largely associated with land rights. Water rights are given in terms of licences. In future all water users need to register and apply for licences. A potential secondary market could result from this (DBSA 2006).

Waddell (2000) mentions that the key summary of the WSA is "some for all" rather than "all for some". Francis (2005) pointed out that the NWA is pro decentralisation, cost recovery and privatisation. The WSA is aimed at increasing delivery in terms of the first rung of the water ladder and the 25

lpppd. Francis (2005) argues that although the new NSA and WSA Acts are aimed in the right direction, the reality is that there are loopholes for pre-existing large scale water users. Even though the state can re-allocate water, the business user was entitled to compensation that the government could not afford. Therefore large apartheid users can retain their control over large water resources.

A further important water act was the FBW, the Free Basic Water Act of 2001(6kL/month/household free water)

It is noted that the FBW of 6kL/month/household is higher than the 25 lpppd as per the WSA. Based on 5 occupants per household the 25 lpppd translates into approximately 4 kL/month. If a household of 5 were able to use only the 6kL/month it would seem possible. However 25 lpppd appears low if we include water for bathing,, and other uses. Francis (2005) recommends 50 lpppd translating to approximately 8 kL/month. If we use 80 lpppd this translates into approximately 13 kL/month. Nzimakwe (2009) quotes typical consumption of 15-20 kL/month. Based on these figures 15kL/month would be a reasonable monthly usage for a household of five people. If occupancy was doubled to ten occupants per household 30kL/month would be a reasonable household consumption. This data was used as a basis for tariff comparison for poor households.

Initially, local municipalities had to fund the FBW Act by carrying the cost of the free 6kL/month per household. The Strategic Framework then committed the government to provide funds to local government. In 2003/4 government started to give local governments an equity share of the income they brought in (Francis 2005), mainly to fund the free basic water. Even with the Strategic Framework that kicked in 2003-4, local government still had problems due to funding based on an equitable share being insufficient, more pressing needs at a local level and the local mismanagement of funds (Francis 2005).

In summary, government's water goals are, at least, to provide a basic water service to all people and implement the policy of the NWA, WSA and FBW. WSA posits some-water-for-all rather than all-for-some (Waddell 2000). NWA favours decentralisation pointing towards privatisation and leaves loopholes for large businesses with existing water allocations (Francis 2005). The FBW provides for 6kL/month per household to all water users. This 6kL/month is less than the 15kL/month needed per household and is provided to all households irrespective of income level.

2.4.8 Balancing Act

Waddell (2000) highlights key differences between government, business and civil society. These are shown in Table 3 and 4. The different goals highlight the potential for the infringement of other party rights. He mentions that in the water sector the Mvula Trust was used as a BOTT member to look out for the peoples' interest but lacked the management skill. He further notes the timing mismatch between government and business. Government is more strategically inclined and moves slower than business which requires quicker, predictable phases for contract support. Table 4 also shows the differences in typical attributes of each party. Government and civil society are treated as one for the purposes of this study. Based on the goals and sector attributes, government and business would, theoretically, drive the water sector in different directions.

Table 3: Trade-offs between government, business and civil society

GOVERNMENT	BUSINESS	CIVIL SOCIETY
Inflexibility in rule	Tendency to monopoly	Restricted (interest) focus
Slow pace of decision making	Disregard for externalities	Amateurism (staff as volunteers and in training
Complexity of jurisdictions / level	Poor integration of long-term concern	Material scarcity

GOVERNMENT	BUSINESS	CIVIL SOCIETY
Difficulty in internal co-ordination	Inequality of outcomes	Fragmentation (scale)
Desire to control other	Transactional parochialism	Ideological parochialism
	Ideological agnosticism	

Bakker (2003) suggests that rural areas or areas with a population less than half a million people are unlikely to attract the interests of the formal private sector. The majority of the large projects involve a local company and a large sector leader. SUEZ Lyonnaise de Eaux and Vivendi General des Eaux, both Fortune 100 companies, control about 70% of the world market and can get finance from international banks such as the World Bank. Table 1 confirms the 70% market share. With the developed world having taken advantage of Africa in the past, if not executed ethically this scenario could have potential for misuse.

Nzimakwe (2009) suggests that international operators have been disengaging from water sectors in the developing countries. In SA there are six municipal PPP's in the solid waste and water services area. Without any clear backing he argued that private investment in the water sector should be encouraged because of it brings know-how, efficiency and investment capital. Although Waddell notes that investment capital is not normally put in by the private investor (Waddell 2000).

Swyngedouw (2010) argues that PPP's would be driven towards investments that increase profits, for example through expansion. He adds that private companies are more interested in profitable supply than investing in infrastructure. In spite of clear evidence to the contrary of plentiful water, he says that dubious environmental alliances have used the scarcity-of-water argument to ration water supply and control the sector.

Table 4: Sector Attributes

ATTRIBUTE \ SECTOR	GOVERNMENT	BUSINESS	CIVIL SOCIETY
Primary interest	Political	Economic	Social
Primary control agents	Voters/rulers	Owners	Communities
Primary power form	Laws, police, fines	Money Traditions	Values
Primary goals	Societal order	Wealth creation	Expression of values
Assessment frame	Legality	Profitability	Justice
Goods produced	Public	Private	Group
Dominant organisational form	Governmental	For-profit	Non-profit
Relationship basis	Rules	Transactions	Values
Organising frame	Administering	Managing	Developing
Temporal framework	Election cycles	Profit-reporting / business cycles	Sustainability/ regeneration cycles

In the SA Water Sector, social goals and private investment goals are divergent. Business favours profit maximisation and government strives for fair distribution of water since it is a limited resource. Rural areas, because of low population densities and non-payment issues, are not deemed to be attractive investment areas and are, therefore, not suitable for private investment (Francis 2005; Bakker 2003; Alence 2002). Given the difference in goals between government and the concessionaire, a strong state is needed to manage a concession (Tanka and Fuller 2010). Lack of capacity to manage SA concessions has been cited as a problem (Harvey 2003; Bender and Gibson 2009).

2.5 Propositions

The following propositions were developed from the literature review.

2.5.1 Proposition 1

Private investment can improve service delivery in the SA water sector.

2.5.2 Proposition 2

Private investment in the SA water sector negatively influences equitable water distribution particularly to the rural poor.

2.6 Conclusion of Literature Review

Raw water is an impure public good and potable water resembles an economic good. There is a theoretical case for private provision of water. The key theoretical argument against private investment is under-provision of water.

Water privatisation had begun in the 1990's predominantly in Latin America where there were positive benefits in the overall functioning of water supply but mixed performance in terms of service delivery to the poor. Africa is characterised by the mixed performance of private investment. The balance of improving service delivery by improving efficiency without compromising the right of the poor to water has not been realised. The South African experience is similar to that of Africa. A landmark concession type agreement was reached in 1999 with British Biwater in Nelspruit. Clearly service delivery is not only dependant on whether water provision is by private or public provision.

South Africa is a water-stressed, semi-arid country that has poor water service coverage. Poor water quality is largely due to the aging infrastructure that was not properly invested in during the apartheid era. Because of inadequate water service to the poor, water has been politicised. Government has introduced

policies to address the challenge of equitable distribution but there is a lack of capacity within municipalities to implement these effectively. Private investment can provide the capacity and expertise to improve service delivery, most particularly in high density areas. This would, however, leave the rural poor at risk because there is inadequate existing infrastructure in these areas and cost recovery is low.

2.6.1 *Proposition 1*

Private investment can improve service delivery in the SA water sector.

2.6.2 *Proposition 2*

Private investment in the SA water sector negatively influences equitable water distribution particularly to the rural poor.

CHAPTER 3: RESEARCH METHODOLOGY

In this section the methodology of conducting the research is described. Further classification is made and a discussion of data collection and analysis, reliability and validity is completed.

3.1 Research methodology /paradigm

3.1.1 Choice of Research Methodology

The qualitative method was chosen as the research methodology since it fitted the propositions and it suited the personal experience of the researcher and the intended audience of the report (Creswell 2003). The researcher felt that both government and private enterprise would show a keen interest in good qualitative data. The method allowed the researcher to develop a deep understanding of key themes, rich in detail and with appropriate quotations. The qualitative approach has been successfully used in the SA water sector (Buhl-Nielsen 2001; Harvey 2003; Smith et al 2005, Waddell 2000; Woghiren 2005).

A major challenge of qualitative method, however, is to contain subjectivity that may be introduced by the interviewer. Peer checking was thus undertaken to address this and the interviewer reviewed the collected data (taken in note form and through video recording) to ensure the accurate representation of respondent views.

3.2 Research Design

The interview form, using a semi-structured discussion guide, was chosen because it provided the best opportunity to explore individual perspectives and experiences in a flexible but focussed manner (Kalaf et al 2008). Face-to-face interviews allowed the interviewer to probe issues effectively by reading facial

expression, tone of voice and body language. It also provided the opportunity to probe new ideas as they come to light.

Telephone interviews were used subsequently to follow-up on issues that needed clarification or additional information. During the course of the study Email was used for member checking only and not for actual interviews. Pre-testing, as recommended by Kalaf et al (2008), was conducted to practice for the first interview and ensure that the recording equipment was in full working order.

3.3 Population and sample

3.3.1 Population

The Mbombela municipality with the landmark 30 yr concession agreement with British Biwater was chosen for the study. Initially, only respondents from the municipality were targeted: employees at management or engineer level in the water sector exposed to private sector investment. However it turned out that the concessionaire had taken over some of the municipal employees working there prior to the agreement; the remaining municipal employees retained control over the area not covered by the concession and also monitored the work performed by the concession. It thus made sense to draw respondents from across the operating landscape to reflect the experiences and opinions of both parties more fully.

3.3.2 Sample and sampling method

Twenty respondents at management level in the municipality and the concession were targeted from operations, finance and customer management to complete the in-depth interview. Because of the richly diverse profile of the respondents who agreed to be interviewed, only twelve interviews were

subsequently conducted ranging from 30 minutes to 3 hours. Further detail is shown in Section 4.2.

3.4 The research instrument

Semi-structured interviews were conducted using a discussion guide and guidelines from Kalaf et al (2008) who recommended introductory questions, followed by an outline of key topics, and then the conversational direction chosen by the respondent and interviewer. The interview included questions dealing with both research propositions. Refer to Appendix A for the full research instrument. Codes were pre-populated with factors from the literature survey as a form of checklist for the interviewer. However no prompting per factor was attempted until the respondents made their initial inputs.

The interview was steered towards the two research propositions in the following sequence:

- The changes after the introduction of private investment. Individual aspects were probed including efficiency, capital investment, management structure, capacity to spend allocated budgets, and overall service delivery. Any new themes were followed through.
- The effect of private investment on social goals with an emphasis on service delivery to the rural poor and service cut-offs. Again respondents were given room to choose the direction with the interviewer.

The following guidelines from Bell (2005) were borne in mind while conducting the interviews:

- Avoid the temptation to give emphasis to statements that support the interviewer's point of view.
- Look for categories and common criteria.
- Guard against bias.

3.5 Procedure for data collection

Interviews were conducted over a nine month period. Two days were agreed with the municipality for the face-to-face interviews and two interviews were conducted on site. Because of the travelling distances involved and tight employee schedules, the balance of the respondents were interviewed via cellular telephone.

Miles and Huberman (1994) advise that less than fifty percent of what is spoken in an interview gets recorded using manual note-taking. For this reason a dual recording system was used: each interview was videotaped and manual notes were taken using the research instrument. Although this raised issues of a lack of anonymity, the subject matter was not of a personal nature. Once the respondents knew that only the researcher and the supervisor would be viewing the material their anxiety fell away.

All interviews and follow-up calls were summarised and written up to simplify analysis. The written notes were typed up after transcription of key points of the interview. The interview recordings helped a great deal in capturing the interview properly. In some instances the entire viewpoint of the respondent was corrected. Summary transcription, even though done in parallel with interviews was time consuming.

3.6 Data analysis and interpretation

Bell (2005) advises that raw qualitative data needs to be recorded, analysed and interpreted, and suggests that coding be used to cluster key issues. Miles and Huberman (1994) recommend early data analysis and various types of data collection.

The method employed in this study used key elements from Miles and Huberman (1994) with modification. The interview records allowed for easy manual coding. By recording positions on each of the sub-problems and two

propositions, the views were clustered and richness and depth of arguments reviewed in each cluster and then organised into key themes. (This also facilitated the counting of positions on each sub-problem which was done quantitatively.) The risk of doing this upfront was that direction was set too soon: however due to the reduced number of interviews the structure enhanced data collection and analysis.

3.7 Validity and reliability

3.7.1 External validity

Validity is the congruence or measure of fit between the research, the evidence and the conclusions drawn. External validity is the ability to generalise the conclusions from the study to a larger population (Kalaf et al 2008). Since only one municipality was used this remained an issue. Quantitative data from a randomly chosen non-private investment municipality was also obtained.

In terms of the respondents, artificial circumstances may lead to atypical behaviour (also called 'on-stage effects') (Kalaf et al 2008). This was minimised by not telling the respondents of any potential conclusions and maintaining interviewer neutrality. The interviewer did reveal some bias once respondents revealed their position on the key elements.

3.7.2 Internal validity

Internal validity is whether the study draws the correct conclusions from the data (Kalaf et al 2008): if the variables in a study, for example, do not measure the intended parameter. Other threats include incorrect causal inferences and the absence of randomisation.

Member checking, where the respondent checked the short interview record, was performed on the first interview to ensure that the interviewer was recording properly. Minimal variation was found and, thereafter, no further

member checking needed to be performed. Peer debriefing, where peers check the transcript of the interview against the video interview, was performed on 10% of the sample, chosen randomly. Coding was used to facilitate peer debriefing and member checking. In addition, an audit trail was maintained with the recording of the interviews. Overall negative case analysis was planned but not completed.

3.7.3 Reliability

Reliability deals with consistency and repeatability: similar findings are revealed with repeated applications. A reliable measure minimises error, the difference between the measured value and the true value. In qualitative research dependability is a more apt term: how truthful the researcher is and how truthful the research is (Kalaf et al 2008). To maximise dependability the following steps were taken:

- Multiple questions were asked on the same topic to form a respondent view.
- Trial respondents were tested to prove the method and allow for inconsistencies due to methodology.

Based on the opinion of the interviewer, the respondents answered honestly. Where they felt uncomfortable giving a response, they were not pressurised to do so.

CHAPTER 4: PRESENTATION OF RESULTS

4.1 Introduction

The results are presented per proposition. The themes are discussed in Chapter 5.

4.2 Demographic profile of respondents

Table 5 shows the respondent profile. The mix of respondents included employees of the private company up to MD level, seconded municipal employees, a councillor, municipal managers involved in monitoring the concession, and a municipal employee outside of the concession area.

Table 5: Summary of Interviewee Distribution

Level of Respondent	No. sampled
Directors up to MD	3
Councillor	1
General Manager	2
Manager	4
Community Liaison Officer	1
Engineer	1

4.3 Results pertaining to Proposition 1

Table 6 indicates a summary of the position of the respondents from Mbombela municipality and the concession company Sembcorp Silulumanzi. Respondents commented on how each factor changed after private investment.

Table 6: Summary of Mbombela Concession Respondents' Position on private investment influence on each factor

Factor Change after Private Investment / Respondent Position	Efficiency Increase	Capital Increase	Structure Improvement	Increased Capacity in Spending Budget	Improved Service Delivery
FOR	10	9	9	11	12
AGAINST	0	0	0	0	0
MIXED	0	1	1	0	0
NO RESPONSE	2	2	2	1	0

Of the Mbombela respondents, 83% felt that there were improvements in efficiency due to private investment. Similarly 75% of the respondents felt that capital investment and structure had improved. 92% of interviewees believed that privatisation had increased capacity in budget spending and that the concessionaire's in-house skills benefited service delivery. 25% of the respondents commented that the concession had not done well on BBBEE targets and had more urban areas than rural areas in their scope. 50% raised high skill and experience levels in the concession as a key factor that changed after private investment.

There was unanimous agreement that private investment in the Mbombela concession area had improved water service delivery (100% of total). Indicators of service delivery improvement were:

- The quality and reliability of service had improved.
- KPI's and targets were being met.
- The concession scope had been increased and further increases were foreseen.

4.4 Results pertaining to Proposition 2

Table 7 shows the summary of opinions of the Mbombela Concession respondents on the impact of private investment on social goals.

Table 7: Summary of Mbombela Concession Respondents' Position on private investment influence on each factor

Factor Change after Private Investment Respondent Position	Increased Service Cut-offs	Reduced Service Delivery to the Rural Poor	Equitable Distribution of Water
FOR	7	0	8
AGAINST	2	10	0
MIXED	1	0	2
NO RESPONSE	2	2	2

Of the respondents, 58% felt that there were increased service cut-offs (due to non-payment). 83% were off the opinion that service delivery to the poor had not been reduced. Further themes that emerged were the challenge of providing bulk water, increased water demand due to rising rural populations, cost recovery, political influence and social engagement.

Overall, 80% of the respondents commented that water distribution was equitable after private investment had occurred. Indicators of this were rural versus urban challenge, KPI targets for rural areas and customer surveys.

4.5 Summary of the results

The interviews conducted at Mbombela confirmed Proposition 1, that private investment had improved service delivery. Proposition 2 - that denied the negative influence of private investment on the achievement of social goals for the rural poor particularly- was not supported. However, the results were specific to the Mbombela Concession and caution should be exercised in applying the findings to the whole of South Africa.

CHAPTER 5: DISCUSSION OF THE RESULTS

5.1 Introduction

The results were clustered into themes for each proposition.

5.2 Proposition 1 Themes

5.2.1 Concession background

Prior to 1999, the municipality was in charge of the concession area under DWAF as shown in Figure 5 from Anon (2010). Competitive bidding was used to arrive at a concessionaire. Sembcorp Silulumanzi won the bid. The original mandated area was originally the Nelspruit town council in the municipality but after a new demarcation the concession inherited a bid area outside of Nelspruit known as the Old Kangwane Government or homelands. The number of households to be serviced thus grew from 10,000 in Nelspruit to 35,000-40,000 households in the expanded operational area. The increased responsibility placed pressure on the concession to meet the new demand for water services.

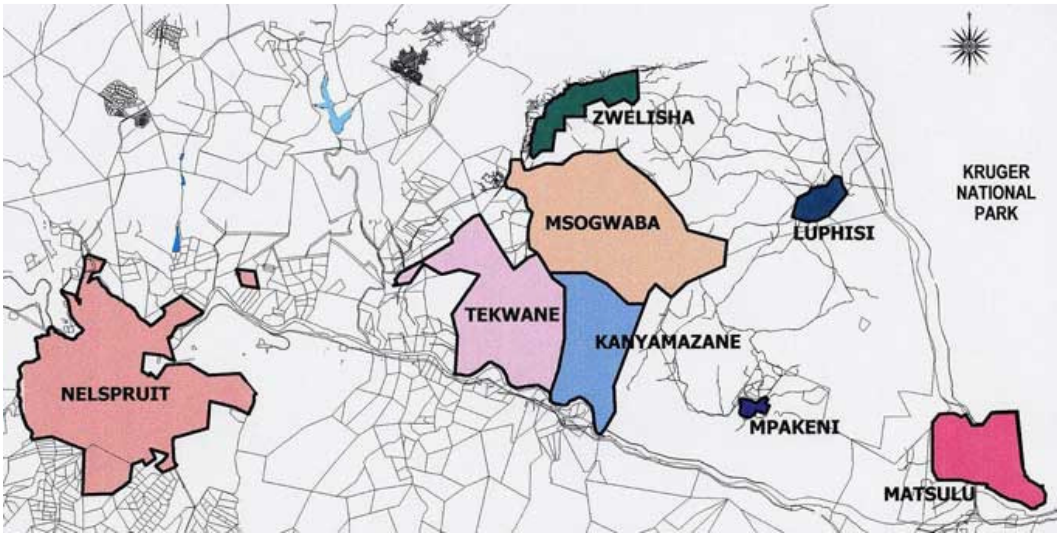


Figure 6: Concession Area

Inside Nelspruit (also called urban areas), water service delivery was of a good standard. Municipal staff were transferred to the concession at inception in 1999. There were no personnel present in the old Kangwane Government area and service delivery outside Nelspruit (also called rural or peri-urban areas) was very poor. These were previously DWAF assets and the area was then called Nelspruit Transitional Council. In 2002, it became Mbombela Municipality. It should be noted that the Municipality still controls some of the areas outside of the concession. The concession is now in its 3rd term with each term lasting five years.

5.2.2 Change of Overall Service Delivery

Of the respondents, 100% felt that water service delivery had improved once a concession was in place in the Mbombela area. Measures of the improvement raised by respondents were quality and reliability of the supply, Key Performance Indications (KPI's) and increased concession scope of supply. "There is a huge improvement in the service where they (the concession) are responsible." claimed a municipal respondent.

a. Quality and Reliability of Supply

Of the respondents, 42% submitted that the quality of the water supply had improved. The concession had obtained blue and green drop status, which is a measure of water quality. Bender and Gibson (2009) concur with the water quality improvement. In a South African context, blue and green drop status is not common and only 43% of local municipalities are compliant in water quality (Nzimakwe, 2009).

Respondents commented that service reliability in the rural areas had improved. They said that although there were still areas of intermittent water access, there were now more areas with 24-hour access.

b. Contractual KPI's and Targets

The Concession Monitoring Unit (CMU) monitors the contract between the municipality and Sembcorp Silulumanzi (the concession) using KPI's and targets. The KPI's were reviewed every five years with the municipality. With the exception of BBBEE targets, respondents noted that the concession was performing well on the KPI's. Concession respondents mentioned that they preferred being checked against their KPI's frequently to help them to be more efficient.

Municipal respondents reported that bulk water outside of the concession's control had required them to give the concession some leeway for rural KPI's. However, bulk water from Bushbuckridge Municipality only had an effect on Kanyamanze water supply (Bender and Gibson 2009).

Bender and Gibson (2009) stated in their review of the concession for the period 1999-2009, that the CMU did not have the necessary operational and financial skills to fully monitor the concession. Compared to the CMU, the concession employs more personnel and has greater contextual knowledge and experience. Hence it was possible that they were able to influence the CMU to their advantage. Bender and Gibson (2009) did mention that risk elements of the initial concession contract were changed in the concession's favour after inception. Harvey (2003) also commented negatively on the CMU in the context of monitoring of the Jo'burg Water private investment.

c. Increased Concession Scope

Respondents claimed that the concession area had increased and further coverage was being negotiated. The areas of the concession initially were more hard piped connections and were then expanded to some of the rural areas. In terms of water service the concession took over the water treatment plant in Matsulu. One respondent claimed that there was significant increase in the number of consumers and that the concession was currently around 45% of Mbombela. The mandate of the concession had expanded to include some

previous municipal functions such as municipal plan approval and township establishment because of their superior skill set. Increasing the concession's scope showed that the CMU had sufficient confidence in the concession.

Smith (2005) submitted that adding new areas that had never received water services before the concession appointment would be a challenge. Iimi (2008) argued that water supplied should be greater than 40 million m^3 for economies of scale (and therefore a competitive bidding process) but not more than 400 million m^3/year to prevent diseconomies of scale (and a lack of competition). Using the 76L/day supplied for 2009 from Bender and Gibson (2009) the concession supplied 27 million m^3/year. Hence further allocation to increase their water sold to above 40 million m^3/year would be beneficial in terms of economies of scale. Similarly Bakker (2003) noted that rural areas or areas with less than half a million people are unlikely to attract private investment. Hence increased scope would be supported by this argument as well.

5.2.3 Efficiency change as a result of privatisation

Of the respondents, 83% felt that efficiency had improved by having a concession in place. Key elements of the improvement were faster decision making, fault resolution, monitored KPI's and project execution.

The decision-making process in the Concession was helping project development by freeing up bottle-necks in the reticulation system. An example was given by an ex-municipal respondent who noted that a small technical repair that is given the go-ahead in a short thirty minute meeting of the Concession would have taken over a week when governed by municipal approval processes. When the municipality was in control this kind of delay had an impact on morale and thus performance. The person driving the repair would be motivated initially, but would subsequently become discouraged from resolving the problem. Bushbuckridge municipality, a neighbouring public municipality, reported procurement process delays and late payment of service

providers (Anon, 2012B). This caused demotivation of service providers which negatively affects project execution.

The concession's efficient decision-making process extended to project development and execution (further discussed under capital increase) and day-to-day running of the water service, including fault resolution.

"If a call comes in at 7pm, by 7:30pm we (the concession) are already attending to it", was claimed by one of the municipal respondents seconded to the concession.

The concession had benchmarks for fault response. For large pipe bursts a three-hour reaction time was required and for a minor leak a response time of 12 to 24 hours. Respondents noted that resolution was regularly within these parameters. Using the call centre and job logging, performance was monitored. It was also claimed that customer service had improved. Satellite centres were created in the rural area of Kanyemazane with local customer service offices to deal with queries.

The concessionaire was monitored by a benchmarking system of Key Performance Indicators (KPI). "We (the concession) monitor all cost drivers, energy drivers and efficiency", a respondent noted. The concession tariff was based on the financial cost of water service delivery. The contract between the municipality and Sembcorp Silulumanzi was monitored using the KPI's. Critical KPI's are reviewed every five years with the municipality. By reviewing the Concessionaire's financial performance over the 2001-2009 period, Bender and Gibson (2009) reported tangible efficiency gains from the concession.

In the urban area the concessionaire controls the entire water supply chain from source to tap. However respondents claimed that in the rural areas, bulk supply was provided by Bushbuck Ridge Water Board which was still controlled by the municipality at the inception of the concession. Although, this area was added to the concession in 2007, respondents claimed that the poor bulk water supply had a negative impact on service delivery in the rural areas, leading to

intermittent supply. However it was also stated that overall rural supply had also improved.

Of the respondents, 17% refused to comment on the change in efficiency. The interviewer believes that respondents may have felt defensive and uncomfortable in the interview. One respondent mentioned that efficiency varies according to the area of supply. The concession focuses more on the town areas and only a part of the rural areas. The remaining rural areas exhibited bulk supply issues.

5.2.4 Capital Increase due to the concession

One of the major problems in the water sector is the decline in capital expenditure. 75% of respondents observed that capital expenditure had improved once the concession was in place.

Projects can be funded in three ways. Municipal Grant Funding (MIG) is a conditional grant that a municipality can make for large projects, such as a new reservoir, and usually pertains to projects in rural areas with poor cost recovery. The concession also funds projects in its appointed area. Very large projects, such as a new dam, are generally funded by the Department of Water Affairs (DWAF).

In certain peri-urban areas, respondents claimed that cost recovery is virtually zero. Here MIG funding is the only option. Municipalities fund projects in these areas to prevent increases in tariffs that are driven by the need for cost recovery. An example of this was a new sewage plant built in Matsulu. It was also claimed that MIG funding is a cheap source of CAPEX well suited to the peri-urban areas.

The urban areas were traditionally areas of greatest cost recovery. The concession projects are funded from the profit of the concession. It was claimed that 10% of its profits are reinvested in CAPEX replacement, based on the

budget and not as a requirement of the contract. A municipal respondent claimed that the concession funded six projects in 2011. Other municipal respondents claimed that were significant expansions in Nelspruit. The Raw Water Treatment Plant in Matsulu is a significant example. In the hands of the municipality raw water was being pumped to consumers in certain rural areas. In the hands of the concession the mothballed water plant was reinstated and used to purify water to a potable status for consumers.

Since the concession is run as a business a return for the invested capital is expected. However the municipality approves capital expenditure and also the tariff on a yearly basis to prevent excessive tariffs. The municipality-owned infrastructure was rented out to the concession for a rental fee. Concession investment funded from providing water at a financial cost, gave some demonstration of a self-sustainable business model for water service delivery. Municipal respondents were satisfied with this and claimed that this was the intention of the concession.

In urban areas the concession had an autonomous supply where they extracted water from the river, purified it, supplied it to the consumer and collected payment. The concession invested CAPEX in the water reticulation system, such as pipes, payment meters, and pumps for maintenance and expansion. Respondents stated that pump stations previously in municipal control were not properly maintained and that the concession had to assist.

Bender and Gibson (2009) reported that due to the free basic water principle and unpaid bills the concession was dependant on public subsidies and capital grants to serve poorer areas of the concession.

5.2.5 Change in Capacity to spend allocated budget

The inability to administer capital was a major limitation in the SA water sector (DBSA 2006; Buhl-Nielsen 2001; Ensor 2010; Magadlela 2004). An improvement in the capacity to spend allocated budgets due to the concession

was noted by 92% of the respondents interviewed. Tangible results were the utilization of the CAPEX budget for MIG and concession-funded projects.

In terms of concession-funded projects, respondents declared that committed investments were expended. The Concession Monitoring Unit (CMU) monitored performance of the concession. This spending was necessary to achieve the required performance.

In addition, municipal respondents claimed that the concession had improved the capacity to spend MIG funding and other grants. The municipality had a Service Level Agreement (SLA) with the concession where these projects are given to the concession to implement. The concession executed the projects on behalf of the municipality and received a project management fee. From 2009 there had been approximately R15 million per year invested using this SLA. The council had put in new structures to execute large capital projects in 2004-5.

The municipality did not have the capacity to formulate plans for capital projects. Prior to the concession this function was outsourced to engineering consulting companies. A respondent claimed that this process itself would typically take nine months. When the concession started there were no engineering members of staff. However, at the time of the interviews in November 2011 there were ten employees involved in project implementation. Respondents claimed that project execution was faster due to in house planning and engineering skills. In addition, since the asset was held by the concession, they ensured that the quality of construction was of high standard. Improved in-house skill levels were a common thread in all themes.

5.2.6 Structure improvement with privatisation

This theme was raised in the literature. It was noted that at the higher echelons of government there was a blurring of responsibilities between water sector entities. Municipalities had to take day-to-day responsibility for delivery whilst being dependent upon these structures for raw water and information.

It was difficult for respondents to comment on how the structure of the water sector had changed due to the concession. The concession's key interface was with the municipality and the consumers directly. Hence the comments on structure appeared to be an indication of the concession's internal structure and direct interface with the municipality. In retrospect asking respondents to comment on the overall structure of the water sector was unfair.

Of the respondents, 67% believed that the structure had improved, that the concession structure was working well. Even with the "NO RESPONSE" respondents (17%), an efficient concession structure was admitted.

The concession fell under the Water and Sanitation Department and concession reported to the Concession Monitoring Unit (CMU). The concession structure had not changed since 2007 and had acceptable attrition rates. The concession had senior managers reporting to a board of directors. The internal structure was restructured to be more cost effective. Decentralised offices were used for local operational and customer services offices. The concession had taken over employees from the municipality since inception in 2001. Currently the concession has around 250 employees.

Respondents, including those from the municipality, submitted that the concession had brought in more capacity than the municipality had. The concession also approved building plans and was a branch of council with engineers, architects and planners (a function previously performed by the municipality). In terms of interfacing with the municipality, respondents stated that approvals from the municipality were causing some frustration.

A key negative opinion submitted by two respondents was a lack of Broad-based Black Economic Empowerment (BBBEE) in the concession management. They claimed that there was no BBBEE policy with the concession but admitted that because the concession was performing well, it was given some leeway on this KPI. Although this may appear to be a local social matter, as a global issue it is similar to the question of whether to use

local rather than imported human capital as a strategy for sustainability. Bender and Gibson (2009) also reported the lack of BBBEE as an issue, given that it was a contract requirement. Initially a BEE partner owned 10% of the concession shares but these were bought back (Bender and Gibson, 2009).

5.2.7 In-house concession skills and experience

Half of the respondents noted that the concession brought higher levels of skill and experience. This resulted in better performance, increased functionality in terms of building plan approvals, township establishment and project management. Respondents submitted that concession staff had engineering and concession management experience from around the world and used this effectively when managing the Mbombela concession. For Sembcorp this was one of many concessions around the world. In terms of levels of experience "decades in the water industry" was mentioned; some personnel had 25-40 years of experience in the water industry.

A seconded municipal engineer summed it up:

"This is the water industry. You (the concession) have efficient plumbers, highly qualified, highly competent people…and the company has invested a lot in terms of financial resources and personnel. They don't strike for equipment."

Working from the premise of high skill and water sector experience levels it was inferred that the concession had an ability to employ suitably skilled and experienced personnel. The following municipal manager quote is a plausible explanation:

"They (the concession) are able to recruit people with capacity to occupy certain positions that are critical to the water service centre whereas in our case (the municipality) it is much more difficult. Sembcorp Silulumanzi is a private company, so their regulations are more flexible for employment. For the municipality to recruit an engineer or lower level post we (the municipality)

compete with other organisations and the municipality cannot counter offer." Bender and Gibson (2009) submitted that it can take many years to recruit and develop the level of talent needed for contract management and monitoring.

5.2.8 Other themes

Political influence as a theme also emerged from the interviews along with the urban area focus of the concession which enabled high cost recovery. The rural bulk water supply challenge was also raised. As these themes also emerged in Proposition 2 they are more fully unpacked in section 5.3.

5.3 **Proposition 2 Themes**

5.3.1 The concession influence on equitable water distribution

Of the respondents, 67% believed that water distribution in the Mbombela concession area was equitable. Appropriate measures of this were highlighted as rural versus urban water service improvement, KPI targets and customer surveys conducted.

a. Rural versus Urban Water Challenge

Respondents commented on the overall balance of business goals and social goals in the water sector. Government via the municipality was the driver of social goals (water for all) whilst the concession was driven by business goals to increase profits through better revenue streams and lower cost. A balance was therefore necessary.

The city area has had good service even before the concession. Improvements were largely in the areas where service had been worse, in the rural areas specifically. Overall service had improved and larger areas enjoyed 24-hour supply. The quality of water had also improved with some consumers in Matsulu getting potable water instead of raw water.

Respondents commented that although distribution was equitable the rural areas were still faced with challenges. The infrastructure in rural areas was not adequate for servicing rural areas. Certain rural areas got water on a rotational basis and not daily. All respondents accepted that the rural areas were facing challenges, even areas out of the concession. However, more than 90 percent of respondents submitted that the concession had improved water service delivery to the rural poor.

Cost recovery in the urban areas was much better than the rural areas. Bender and Gibson (2009) confirmed this quantitatively with urban Nelspruit contributing 95% of collected revenue. Hence there was some level of cross-subsidy. However the tariffs were controlled by the CMU to keep tariff levels in check. In addition, government, via the municipality, invested MIG and other grants into rural areas for infrastructure. Therefore paying city dwellers were protected from unfair pricing. The CMU also had KPI's in line with social targets in the concession contract.

Bakker (2003) stated that the public water supply suffered from low investment, low service standards and low cost recovery, causing a vicious cycle and rendering it unsuitable for private investment in non-urban areas.

b. KPI targets

KPI's are used in the contract for the concession that is administered by the CMU. Further details were discussed in Proposition 1. National government and national treasury guidelines were met using the KPI's in each five year cycle where the contract is reviewed. Affordability and value for money applied as two of the KPI's for the contract. Surface coverage targets were also part of the KPI's.

In terms of affordability there was an indigent policy for those who could not afford water. Consumers could ask their ward councillor to fill in forms allowing them to get discounted rate above the free 6kL a month. A typical monthly bill would then be around R60 a month (2012 rates confirmed that for around R60,

15kL/month was affordable). A concession respondent said that water supply for 34,000 households had been installed in rural areas as per the surface target KPI. The concession also enjoyed some leeway on their KPI assessment where bulk water supply to rural areas was not directly under the concession's control.

In addition to the KPI's related to the government's social goals, the concession had to be able to make a sustainable profit subject to the regulation of the tariff structure regulated by the CMU. Sustainability of the concession was strategically important, one municipal manager stated.

c. Customer survey

Customer surveys were conducted on a yearly basis. Respondents claimed that the results of the survey in the rural areas were better than for the previous two years, showing an improvement in service delivery. Bender and Gibson (2009) stated that customer satisfaction depended on levels of service. The urban customers who were receiving 24-hour service were satisfied. Rural customers without 24-hour service were dissatisfied but did not understand that the concession was dependant on Bushbuckridge Municipality for bulk water and blamed the concession.

5.3.2 The concessions' impact on service cut-offs

Of the respondents, 58% submitted that water service cut-offs due to non-payment had increased with a concession in place. There was some initial confusion in interviews with service cut-offs that had taken place for water rationing in the rural areas. Recorded interviews were revisited to confirm the respondents' position.

"We (the concession) are more rigorous in terms of credit control" claimed a respondent. The concession is responsible for revenue collection and hence also consumer debt resolution. Non-payment is a key issue. One respondent

mentioned that cut-offs were a strategy to make people pay. However the service itself is restricted but is not full cut-off. A trickle flow device is used to restrict the flow. Although one respondent mentioned that after a period of three months the service could be completely cut-off. There is a credit control policy that allows for this action.

“Up to now there have been few complaints about service cut-offs. We have been convinced that they (the concession) haven’t abruptly switched off anyone’s service. They were not at fault.” said a municipal respondent.

Respondents mentioned that the process of engaging the customer had to be completed before any disruption in service. The customer had to be given time to settle the debt or make arrangements to settle the debt. If the consumer failed to respond after numerous notifications the service was restricted to the free 6 kL/month. A warning of typically 60 days was due process. Municipal respondents were of the opinion that established procedures were being followed.

Water affordability (one of the KPI’s) was taken into account. Respondents stated that the concession was sympathetic to consumers who could not afford water. There was a policy for people who couldn’t afford to pay. Sembcorp had been through “fresh start agreements” writing off the last three years of debt. In addition, certain households qualified for more than 6 kL/month free water per month.

There were differences in consumer attitude between urban and rural areas. In the urban areas there were some problems but people were generally paying. Bills were sent to 74,000 customers with 24 hours supply. Respondents submitted that in town payment was different since this was a mainly middle class area and people were embarrassed to have their water turned off. In the township they did not care.

“People complain that they get the same service as the other people who are not paying,” mentioned a respondent. This was an example of the free rider concept (Gruber 2007).

A culture of non-payment was brought up by multiple respondents and was further discussed along with illegal connections under the political influence theme.

“It’s a continuous cycle and it gets worse and worse. When they (non-paying consumers) are disconnected, instead of paying and reconnecting, they get an illegal connection. Then they (the concession) go again for a fresh start and send an inspector and a plumber to find the illegal connection. People start paying again and then again it goes (non-payment) again. It is very costly for Sembcorp. In some areas the payment is so low that it costs the concession more to keep it alive.”

Respondents emphasized that illegal connections were a major issue in the rural areas and responsible for unaccounted water losses. Even those consumers using illegal connections were given a warning before the connection was terminated. Multiple respondents submitted that Illegal connections are terminated and not restricted. However when a plumber is sent to turn it off he runs the risk of being beaten up. Bender and Gibson (2009) confirmed that illegal connections were a major issue and prevented reservoirs in the rural areas from being filled up.

Respondents stated that the concession could not enforce the by-laws. This role should be performed by peace officers for the local authority of government. However respondents mentioned that there was not much support from the government for by-law enforcement.

A quarter of the respondents felt that service cut-offs had been reduced. The balance of the respondents had a mixed view or did not provide a response.

5.3.3 Change of service delivery to the poor due to privatisation

Of the respondents, 92% believed that service delivery to the rural poor had improved with private investment in Mbombela. Key indicators of this were more areas with 24-hour supply, MIG project implementation, improvements in intermittently supplied areas and areas with unpiped supply. Rural area water supply still suffered from a service backlog (customers that wanted piped water supply but could not be provided with it) and bulk water supply.

There was overlap here with Proposition 1 in terms of improved service delivery and new investment particularly. Project planning and the execution of MIG funded projects were completed by the concession, improving rural water supply. Respondents mentioned an improvement in the rural infrastructure. A example of this was the upgrading of the Raw Water Plant in Matsulu plant. Because the water treatment plant in rural Matsulu was moth-balled, some consumers were getting raw water via the reticulation system. When the concession took over the plant 2007, it was reinstated and the raw water was treated to produce potable water that was now supplied to the same consumers. A reticulation system was also planned for Matsulu.

In the rural areas respondents noted that there were different types of supply.

- Hard piped water supplied to the house, which was the highest level of supply.
- Standpipes, fed by reservoirs or piped water.
- Water tanks called “zozo tanks” that were supplied by water tankers.

“(Before the concession) people had been getting water once a week. Sometimes they get water today and then don’t know when they will get water again,” said a seconded municipal respondent.

Intermittent supply was still an issue with hard-piped connections. Prior to the concession some areas in peri-urban Kanyamanze had 24-hour supply. Now the entire area has 24-hour supply. One of the respondents stated that when he

was younger he used to carry a wheel barrow 250 m to collect water. Now the area he previously lived in receives 24-hour supply. He agreed it was satisfying to be involved with a concession that had improved service to that extent.

Pre-concession Matsulu had no 24-hour supply areas. Now there were areas in Matsulu with 24 hr supply. Overall, Matsulu got around 3-4 hrs of supply per day although a typical rationed water supply was turned on at 8am, closed between 3 and 4pm and then opened again at 9pm. Respondents also stated that areas that were getting water for 3 to 4 hours a day were now getting water for 12 hours per day.

Reservoirs were present in areas where there were standpipes. Consumers that received water once a week were now getting daily service. Respondents commented that prior to the concession; reservoirs were empty because supplies were only delivered twice a week. Under the concession the water was available on a daily basis and the reservoirs always had water in them. Concession respondents mentioned that standpipes were inconvenient and piped water was the target for consumers in line with the government water ladder. Water to the standpipes was provided free to consumers. Water meters that were attached to the standpipes were removed by protesting consumers. In addition hard-piped standpipes were targeted for illegal connections.

“It (rural water service delivery) has improved but we still have a long way to go,” claimed a concession manager respondent.

Respondents submitted that intermittent supply continued to be a problem in the rural areas. The high backlog of customers was an ongoing problem. Two of the key reasons quoted by respondents were the lack of bulk water for the rural areas and the population increase in the area.

For areas where no infrastructure was present water trucks delivered water. In this type of supply there were also improvements with the concession. Filling stations had improved from around 70 sites to around 207 in the concession period. In addition tanks were filled every second day.

Clearly consumers supplied by water trucks were getting the lowest level of service. Respondents submitted that these consumers were at least getting potable clean water. For these consumers a yard connection was the goal. For consumers with standpipes, hard-piped water with 24-hour supply was targeted. This was fully in line with the government water ladder. The government had surface coverage targets for rural areas. Respondents stated that the KPI's in the contract could be used to ensure the concession focussed on improvement in rural areas.

5.3.4 The effect of limited bulk water supply

Bulk supply of water was a significant challenge and contributed to the backlog of supply. Areas with no bulk supply received the lowest level of service: water tanks supplied by water tankers. However, service cut-offs in those areas were caused by bulk water restriction. It was noted that the concession had a bad reputation - unfairly - because of the bulk water supply issue. Bender and Gibson (2009) confirmed this view; however it only had effect on Kanyamanze.

As opposed to the urban areas, bulk water supply to the rural areas was not controlled by the concession. The concession inherited the Sekati area from the DWAF which supplies the rural areas. The bulk of the rural areas are dependent on bulk water supply from Bushbuckridge Water Board which is a third party (to the concession contract) and beyond the concession's control. The concession distributed the water made available by DWAF and had no control over quantity and quality. Hence the municipality has had to absolve the concession of poor KPI performance in these areas.

A concession respondent commented that they were not getting 24-hour bulk supply so they could not give consumers 24-hour potable water supply. The bulk water supply from DWAF was seen to be poor. Possibly this was linked to poor maintenance by Bushbuckridge Water Board. In one case pumps that were installed by the concession were not maintained after heavy rains and

subsequently broke down. The concession had to get involved once again to procure replacement pumps.

It was noted that water itself is a limited resource. The water from the river was not enough for the increased demand in the rural areas. The limit in supply was the actual allocation from the river. Rain can improve the supply but ultimately the allocation was the limit. Respondents admitted that the current bulk supply allocation was not enough for the rural population. In addition there was no bulk storage in Mbombela. Even in the non-concession rural areas, bulk water supply was an issue.

Respondents also mentioned that there was a backlog in the issuing of bulk water licences. They postulated that this was related to the change of the law relating to land ownership. Respondents mentioned that the backlog of bulk water supply and treatment was catching up with the municipality.

A dam was needed somewhere in the Crocodile River Catchment area. With a project of this size, funding was the key issue. Respondents claimed that investment from the government side was lacking and had not been dealt with in the last twenty years. The investment for bulk water is a large project and is above levels for concession and MIG project investments. Two municipal respondents claimed that there was a government master plan in place for more bulk supply. Data from DBSA (2006) and Anon (2012 B) confirmed further spending by government. These kinds of projects have a long payback period. The government was currently paying back the Moquena dam which was built in 1986. The payback period would end in 2016. Thereafter government would look at building another dam. Paying back two dams simultaneously was not possible.

5.3.5 Increased water demand due to population growth

“There is a continuous battle to keep up with the growth,” mentioned one respondent.

Respondents observed that the Nelspruit area had grown and had become the commercial hub between Mozambique and Gauteng. There was growth in the domestic and business water demand in the area contributing to the backlog.

“Today they build and tomorrow they demand water services,” said one of the municipal respondents in reference to new informal settlements.

One of the stated reasons for the backlog was the population increase in the area. A respondent mentioned uncontrolled settlements as an issue that made it difficult to keep consumers satisfied. In the urban areas a building must be cleared and approved before it gets water supply. In the rural areas there are no approvals, causing an uncontrolled situation. Another respondent offered that immigrants were contributing to the population increase particularly Swaziland. With the municipality close to the South African border this is a plausible explanation. Quantitative data confirmed that the number of households had grown from 43,000 in 1999 to 73,600 in 2009 with the largest growth in the rural areas (Bender and Gibson, 2009).

5.3.6 The effects of cost recovery

Respondents stated that the concession operated in areas where it was easier to generate revenue and cross subsidise areas where there was little or no revenue collection. Municipality respondents suggested that this was done to balance the concession. Nelspruit town is not funded by grants or national loans due to high cost recovery. Infrastructure around Nelspruit is funded by revenue collection by the concession. Outside of Nelspruit non-payment was an issue.

Respondents stated that revenue collection in the rural area was poor. In the rural areas they were a very small area of revenue collection. When the concession did collect revenue in Kanyamanze and Matsulu they only got about 20-30%. In the balance of the rural areas they did not collect revenue. It was noted that Kanyamanze was the only rural area with 24 hour supply in all areas.

Respondents submitted that bills were not sent to areas without 24-hour access.

Respondents accepted that where there was not sufficient infrastructure, consumers should not be expected to pay for water. Conversely, respondents claimed that consumers in the rural area were prepared to pay if there were given an adequate level of service. Evidence of this was found in the customer surveys. Kanyamanze and some parts of Matsulu did get 24-hour water supply and there was some revenue collection in these areas.

In the initial contract there were certain limits that were placed on the tariffs. This was the concession's main revenue stream; however they were receiving MIG's for those areas that were not generating revenue for CAPEX projects. Operating expenses for the rural areas were funded by the tariffs. Hence there was a level of cross-subsidising by urban customers but tariffs were agreed with the municipality to prevent excessive pricing. Non-payment in the rural areas did cause higher tariffs for paying customers. Sustainability of the cross subsidisation was raised but the municipality had managed to control the pricing for the last twelve years of the concession.

Smith et al (2005) agree with the poor cost recovery for rural areas and hence comment that rural customers are unlikely to attract investment. Targeting areas of high cost recovery has also been reported by Swyngedouw (2010).

5.3.7 Political Influence

Rural areas were characterised by non-payment. The "culture of non-payment" was raised by respondents. In the past water services were viewed politically as part of the apartheid government. Prepaid meters were removed from standpipes. In the past illegal connections were made by "struggle plumbers".

However theft of water by illegal connections was rife in rural areas and led to high water losses. Respondents also mentioned that it was dangerous to

remove the illegal connection due to consumer physical retaliation. It was preferable to install a proper connection since the pressure loss affects equitable distribution of water. Some parts the reticulation system are 2 to 3 km apart and the leaks affected the distribution. Respondents also felt that there was a lack of enforcement on illegal connections which was in the scope of the local authority.

Respondents explained that municipalities are politically polarised. Especially before elections there was violence and riots. This has had a negative effect on consumer behaviour. Sporadic violence and service delivery strikes were experienced in the concession area. Respondents submitted that these were minimal compared to other municipalities but that not enough work was done to change the mindset. A campaign was needed to educate people and encourage payment for water service.

Respondents did explain that the concession was working with the local political leadership structures to connect with communities. There were also community initiatives in this regard.

5.3.8 Social engagement by the concession

The municipality was trying to educate people on how to use and save water. The concession had been running a social responsibility programme in this regard. The main event was a Sembcorp Silulumanzi Soccer and Netball tournament on a yearly basis. Seventy schools in the Mbombela area were invited, which is beyond the concession area. All the schools received sponsorship and there were prizes for the winning teams. The event was also used as a platform to promote good water practices and water conservation.

Leaks are a critical waste of water. Another project, Ewonga Manzi (Safe Water), focussed on this aspect and involved grouping townships into zones and fixing leaks, removing illegal connections and installing meters one area at a time. Significant improvements have been seen to date.

The CMU recognised the involvement of communities as important, and monitored whether there was smooth interaction between the concession and the community. The concession had community training representatives, and had invested in permanent training centres to engaging with people at ground level. Projects were reviewed by the community prior to implementation.

Another social element the CMU monitored was employment equity, especially racial diversity. A lack of BBBEE was recognised as a shortfall of the concession. However, there appeared to be a lack of local water expertise and skills transfer was mentioned by respondents. When the concession took over employees from the municipality they ensured that skills transfer took place.

Skills development and transfer was mentioned as an important goal of the concession. Sembcorp is a large MNC with years of experience with water concessions. They were investing in the country, bringing in experienced people and transferring skills to local employees. The concession started training their people to read and write and now benchmark according to NQF skill levels. In their 3rd year of NQF they reached Level 4 for internal staff. Before the assets and staff are handed back to the municipality they have committed to ensuring further training.

5.4 **Conclusion**

The results of the research showed that there is a business case for private investment in the SA water sector. Key measures of service delivery in the Mbombela concession had improved including quality and reliability of service, the concession's contractual KPI's and targets, increased concession scope and a review conducted by the World Bank (Bender and Gibson, 2009). The concession had significantly contributed towards higher CAPEX investment and the administering and execution of capital projects. Greater efficiency was apparent in the concession largely due to the level of in-house skill and

experience. In terms of structure, a cited negative outcome was the lack of BBBEE policy which was a contract requirement. Overall the concession had improved service delivery to its allocated area, thus supporting Proposition 1. Bender and Gibson (2009) confirm the positive finding for the concession.

There was also a belief that the concession had not negatively influenced the equitable distribution of water. The urban areas did not present much of a challenge as the infrastructure was adequate and cost recovery levels were higher than 90% (Bender and Gibson 2010). The rural areas, however, had major challenges: infrastructure was poor, there were unaccounted for water losses, and bulk water problems that transcended the concession's jurisdiction. In spite of these issues, the concession had improved water services to the rural area. Therefore the second proposition was not supported: in the Mbombela Concession private investment in the SA water sector did not negatively influence equitable water distribution to the rural poor particularly. In addition, the concessionaire was investing in the local community with social engagement initiatives and the training of employees seconded to the concession.

CHAPTER 6: CONCLUSIONS AND RECOMMENDATIONS

6.1 Introduction

The purpose of this work was to explore the potential trade-off between economic and social goals with private sector investment in the South African water sector.

6.2 Conclusions of the study

In the context of the Sembcorp Silulumanzi concession in Mbombela a qualitative method was used to examine the business case for private investment in the water sector. All measures of service delivery from the qualitative data supported this proposition viz. quality and reliability of service, the concession KPI's and targets, increased concession scope and a review conducted by the World Bank (Bender and Gibson, 2009). Further positive outcomes were an improvement in skills and experience. A qualitative negative was the lack of BBBEE policy which was a contract requirement. Overall the concession has improved service delivery to its allocated area. Smith et al (2005) and Bender and Gibson (2009) confirm this finding for the concession.

Given the difference in goals between government and the water concessionaire, there is potential for private investment to counter social goals and therefore cause an unfair distribution of water. Qualitative measures used from the data were rural versus urban, KPI targets, and customer surveys. Across these parameters the concession was praised for improved service delivery. It was clear that the urban areas did not present a big challenge. They had high cost recovery, bulk water supply was fully in concession control and the existing infrastructure was already in place prior to the concession. It was accepted that the rural areas had major challenges that transcended the concession's jurisdiction.

The concession was praised for the overall improvement in service delivery to the poor. Service cut-offs due to non-payment had increased with a concession in place. A key challenge that emerged from the respondents was the service backlog. The main proposed contribution to that was bulk water supply and increased water demand due to population growth. In the context of Mbombela, the concession did not negatively affect equitable distribution.

6.3 **Key challenges**

There was a potential need for capacity to regulate the concession for social goals. Given the water scenario and the balancing of social and business goals strong management of the concession via the contract was needed. There was subtle evidence to suggest that the CMU required further support to manage the concession. On the same concession, Bender and Gibson (2009) and Smith et al (2005) commented on the lack of capacity in the municipality to manage the contract via the CMU for Mbombela. Harvey (2003) reported a similar weakness by the CMU in a Jo'burg Water context.

Domestic water demand was increasing due to the growing rural population. Water service delivery to keep pace with the growth was challenging particularly with bulk water supply.

6.4 **Recommendations**

Given the difference in goals between government and the concessionaire, a strong state is needed to manage to concession (Tanka and Fuller 2010). Lack of capacity to manage SA concessions has been cited as a problem (Harvey 2003; Bender and Gibson 2009; Smith et al 2005).

The CMU needs to be able to negotiate with a concessionaire on an equal footing in terms of technical capability, experience and available capacity. An owners' engineer role is recommended. For yearly CAPEX and revenue in excess of R100 million per year this is justifiable. This role can be outsourced to

an engineering consulting company on a reimbursement basis or through secondment. To support the CMU with the appointment of an owners' engineer, a government agency such as the IDC with the necessary technical and commercial skills should be able to assist with the tender and appointment process.

The anticipated role would be as follows:

- Technical auditing of the concession can be performed. The owners engineer would oversee and approve amendments to waste water treatment and the reticulation systems. Any preferential diversion of water towards higher cost recovery areas would easily be picked up and adjusted.

- Supporting the CMU for contract reviews

    - The CMU for the Mbombela concession has already obtained external financial support (Bender and Gibson 2009). However having one party supporting all facets of the contract would be beneficial.

    - Legal and commercial support for contract review and commentary on concession proposed amendments.

    - Support in reviewing KPI's from a technical point of view and for spot-checking.

The owners' engineer would allow the CMU to have more technical and commercial back-up for contract reviews and therefore more negotiating power. The CMU will be able to choose the support that is needed from the engineering consulting company in terms of capacity and timing to limit costs. With increases in available engineering project management capacity in South Africa there are sufficient South African resources to fulfil these roles. With the huge growth in revenues and the amount of MIG funding being channelled by the

government this would be money well spent. The increased engineering capacity may also allow execution of higher CAPEX projects by complimenting skills and experience in the concession and potentially assisting with bulk water projects.

6.5 Suggestions for further research

It is suggested that the Ballito concession area be further researched. This concession was discovered while conducting the interviews. The mixed method is recommended for this study.

The skills transfer from an experienced water sector specialist to local municipal employees is a key driver for privatisation. However there was an opinion from some Mbombela respondents that this had not been realised. In the Jo'burg municipality foreign water experts were phased out and local municipal employees were now fulfilling the role. If skills transfer is not fully realised then complete privatisation of the water sector would involve the use of experienced foreigners in key management positions. Although the nature of the private investment between the two municipalities was different, a study into skills transfer and BEE would be recommended.

The interface with housing was not explored. Since fixed connections can only be put into housing, classification of a household and growth of households due to population growth by domestic growth and immigration would be an interesting study.

Respondents did mention that the public sector was not able to compete with the private sector for talent. Differences in salaries and employment procedures were cited as reasons. Adding the low morale issues potentially caused by high bureaucracy this could account for poor performance by government organisations and would be a worthy study.

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APPENDIX A

Research Instrument

SHORT INTERVIEW RECORD and AGENDA	**Int No**	
Site:	**Date:**	
Respondent Name:	**Start Time:**	
Interviewer Name:	**End Time:**	
Respondent Email:	**Res. Tel:**	
1. Introduction	**CODE**	**NOTES**
1.1 Rights of respondent I am recording this interview to improve the note taking process. I may conduct follow-up interview questions via telephone and or email. All data regarding respondent identity will be kept confidential between myself and my supervisor and potentially a peer checker. You do not have to answer any question you do not want to. If you are uncomfortable with any line of questioning, you can ask me to stop or take a break or reconvene if you like.	ACCEPT / NOT ACCEPTED	
1.2 Study Overview b. This interview is conducted as part of the requirements for an MBA. The research is around private investment in the water sector. I can give you further information after the interview to not influence your answers.	INTERESTED / NOT INTERESTED	
1.3 Respondent background (qualifications, experience, exposure)		
2. Before and after private investment		
	EFFICIENCY INCREASE FOR/AGAINST/MIXED /NO RESPONSE	
	CAPITAL INCREASE FOR/AGAINST/MIXED /NO RESPONSE	
	STRUCTURE IMPROVEMENT FOR/AGAINST/MIXED /NO RESPONSE	
	CAPACITY IN SPENDING BUDGET FOR/AGAINST/MIXED /NO RESPONSE	
	SERVICE DELIVERY FOR/AGAINST/MIXED /NO RESPONSE	
	PRIVATE OTHER	

3. Private investment influence on social goals	**INCREASED SERVICE CUT-OFFS** FOR/AGAINST/MIXED /NO RESPONSE **REDUCED SERVIDE DELIVERY TO RURAL POOR** FOR/AGAINST/MIXED /NO RESPONSE **EQUITABLE DISTRIBUTION** FOR/AGAINST/MIXED /NO RESPONSE SOCIAL OTHER	
4. Other	OTHER	
5. Queries/ Clarifications		
6. Member Checked	NO / M CHECK POS MCHECK NEG M CHECK NO REPONSE	
7. Peer Debrief	NO / P DEBRIEF POS P DEBRIEF NEG	