

Key Challenges to Public Private Partnerships in Botswana

The Case of Water Utilities Corporation – Lobatse Management Centre

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ABSTRACT

The extensive application of Public Private Partnerships (PPPs) throughout the world is comparatively recent. In Botswana, PPPs were first mentioned in the Privatisation Policy of Botswana. The government pronounced in the 2002/2003 budget speech and NDP 9 that PPPs would be widely used as an instrument of procuring and financing infrastructure projects in the public sector. The intention was to ensure sustainable investment in infrastructure and soundness in public finances as well as to decrease the budget deficit to sustainable levels. PPPs are regulated through the 2009 Public-Private Partnership Policy and Implementation Framework. The methodological approach followed is the case study strategy and a qualitative paradigm. The findings of the study reveal a deteriorating water situation over a period of three years. The demand for private sector participation in the water sector is established and areas in which private companies can be engaged are also identified. The research further reveals the feasibility of implementing service contracts within a monopoly–Water Utilities Corporation.

INTRODUCTION

The supply and distribution of water as well as wastewater management in Botswana are centralised on the Water Utilities Corporation (WUC). This action by Government,

Figure 1: Map of Botswana



Source: mapsopensource.com (2017)

was implemented through the Water Sector Reforms (WSR) (Republic of Botswana 2013:67). Prior to these, three authorities were responsible for the provision of water and wastewater services. The Department of Water Affairs (DWA) operated in 17 major villages; 16 District/Town Councils operated in rural areas and the WUC operating in six urban centres (Mudanga 2011:8).

Established in 1970, the WUC's initial mandate was to manage a single project—the supply and distribution of water in what was then called the Shashe Development Area. This management involved planning, constructing, operating, treating and maintaining water distribution resources in the country's urban centres as well as to supply bulk water to the DWA.

Upon their implementation, the WSR sparked many negative media reports. These reports indicated that consumers, particularly the indigent people living in villages and rural areas, were negatively affected.

This study was undertaken at the WUC's Lobatse Management Centre (LMC). The LMC is part of the WUC's sixteen (16) management centres, namely Gaborone, Molepolole, Lobatse, Kanye, Mochudi, Tsabong, Ghanzi, Francistown, Selebi Phikwe, Kasane, Maun, Letlhakane, Masunga, Mahalapye and Serowe. The LMC which is the focus of this study is in charge of 65 villages and one town. These include Lobatse Town, the South-East District, Good hope sub-district and part of the Moshupa sub-district (WUC 2011). The LMC is located in the south eastern part of the country (See figure 1).

- Key to this study are the following questions:
- What was the water situation in the LMC during the period 2011 to 2015?
- What challenges did the LMC experience with regard to water supply and distribution?
- What are the opportunities available for the WUC to improve its service delivery?
- What can be done to improve service provision of water at the LMC?

Although other public sector reforms in Botswana have been evaluated in the past, little attempt has been made, either by scholars or practitioners, to assess the possibility of applying PPPs to the water sector. Much of the focus in the procurement of infrastructure and services in the past two decades has been on outsourcing, which surpassed other forms of procurement (Liou 2001:391). In recent years PPPs have become the preferred means of providing publicly-funded infrastructure and services. To this end, this article explores key challenges to PPPs at the WUC's LMC. We begin by reviewing relevant literature laying a foundation for the study's findings on the possibility of implementing PPPs at the WUC's LMC.

A REVIEW OF PPP LITERATURE IN BOTSWANA

Available literature shows that there is a scarcity of written sources, published or otherwise, dealing specifically with Botswana's WUC. The little information available deals with infrastructure, development of water resources and supply but nothing specific related to PPPs in the water sector, especially in the LMC. For instance, Mabua (1994:11, 13) wrote about the ground water vulnerability of the Lobatse area. In their book titled *The History of Botswana*, Tlou & Campbell (1984:192,193) discuss water development through the drilling of boreholes and the construction of dams

such as those in Gaborone, Shashe and Mopipi. However, the book discusses neither the WUC nor forms of partnership within the water sector. The same can be said for Kgomotso & Swatuk (2007:1264–1273).

Selitshena & McLeod (1989:42–51) wrote about water sources available in various parts of Botswana and the demand for water by various consumers. The authors deliberated on the problem of an inadequate water supply for consumers in urban centres and mining areas, major villages and small settlements. Like Tlou & Campbell (1984:192–193), Selitshena & McLeod (1989:47–50) mention construction of dams as one of the ways to meet the increasing demand. They also note that WUC has been responsible for the management of water in urban areas but they do not elaborate beyond this.

While Bolaane (1992:13–32) provides a detailed history of the WUC, his study does not discuss PPPs. The study focuses mainly on other issues such as the origin of the WUC, the structure, staffing, training and localisation, finance and pricing, consumer attitudes as well as the problems it faced by the WUC. In his book, *WUC: An Engine of Economic Growth*, Malikongwa (1995:1) stipulates the terms of reference for the book, which are to: learn in the office environment about the different functions of different officers and offices; cover various functions of the goals of the organisation's relationship with other entities in its internal and external environment; identify the role, problems, strengths, success and weaknesses of the organisation and to evaluate the organisation's performance along with the suggestions for improvement in light of any shortcomings identified. Malikongwa (1995:1–20) does not discuss PPPs, the LMC or service delivery.

By 2017 limited information available on the WUC can be found in government documents such as various pieces of legislation, the NDP and the National Privatisation Master Plan (NPMP) (Republic of Botswana 2005), as well as the Privatisation Act (Republic of Botswana, 2000). Various public records from the WUC have also been reviewed. The National Water Master Plan (NWMP) provided insight into the entire process of the recent WSR. Most of the documentation could not be obtained from the WUC owing to the confidentiality of the records. It was, however, anticipated that content sensitivity would be an issue with regard to accessing these documents. The researchers decided to maximise utilisation of all accessible records. Divided into two major regions of southern and northern, the WUC has several management centres. With seven management centres, the southern region services the capital city Gaborone, towns and the surrounding villages of Mochudi, Lobatse, Molepolole, Ghantsi, Tsabong and Kanye. In the northern region there are eight management centres and these are the city of Francistown, Mahalapye, Palapye, Serowe, Selibe Phikwe, Maun, Kasane and Masunga.



According to the Water Utilities Corporation (2014), the implementation of the WSRs project increased the WUC customer base from 80 000 million cubic meters at the beginning of 2009 to over 222 000 by March 2013, supplying more than 66 million cubic meters of potable water annually to its customer base. With a property, plant and equipment value of over P3.4 billion, the corporation's infrastructure includes six dams, namely: Gaborone (141 MCM), Nnywane (2.3 MCM), Bokaa (18.5 MCM), Shashe (85.3 MCM), Ntimbale (26.5 MCM) and Letsibogo (100 MCM) as well as the North-South Carrier Scheme, which comprises a 360km long pipeline, water treatment plants and associated pump-stations. Additional dams, the Dikgatlong, Thune and Lotsane are under construction

Water remains an important, but scarce, commodity in Botswana. Its use is primarily for arable and livestock farming, household consumption and industrial development (Matlok 2008:2:1). Botswana is a drought-prone country with limited water resources or potential sites for water-resource development. This situation is exacerbated by the low precipitation, limited groundwater recharge and very high evaporation rates from surface water resources (Kedikilwe 2008:6). In Botswana water, like other natural resources, is public property, the rights and use of which are defined and regulated by the Water Act (Chapter 34:01) and the Water Works Act (Chapter 34:03), as well as the Water Apportionment Act (Moyo, O'Keefe & Sill 1993). Water is therefore controlled and allocated by the state.

According to Kgomotso & Swatuk (2007:1264), universal access to basic water services is a fundamental condition for development worldwide. At the beginning of the twenty-first century a billion people still lacked access to adequate drinking water, while 2.5 billion still did not have access to safe sanitation (Wolff & Palaniappan 2004:1). In the twenty-first century there are still large numbers of women and children in the developing world who are forced to collect untreated or impure drinking water from various sources, often having to travel great distances to reach it (Falkenmark & Rockstrom 2004:26). This problem is not necessarily a direct consequence of the physical scarcity of water but of poor management (Kgomotso & Swatuk 2007:1264).

In the early 1990s the Government of Botswana developed its first NWMP, which was reviewed in 2006 because the government believed there were too many authorities responsible for water management (Mudanga 2011:8). In 2008 the World Bank was engaged as a consultant to examine the recommendations of the 2006 NWMP review. It was found that the WSR were necessary.

Botswana, like many other developing countries, faces challenges to the efficient delivery of public services and infrastructure, including maintenance and operational

obligations. New infrastructure needs to be provided and existing infrastructure upgraded or rehabilitated to deliver public services more effectively or extend access to services at a higher level than the current situation (Rao & Voldolkova 2006:4). A good example is that of parastatals that acquire hefty funding from the government despite operating at a loss year after year (Simukonda 1998:58). The question of PPPs being applicable to the water sector in Botswana is unique in the sense that provision of water was initially carried out by government through its agencies.

SERVICE CONTRACTS

Of significance to this study is a PPP option that has the potential for implementation at the LMC. PPPs have a range of options and one that appears feasible for implementation is the service contracts. Service contracts are the simplest form of PPPs, where the private sector is contracted to perform a specific service for a short period of time (one to three years) (ADB 2008:29), or to complete a specific project. Examples include consulting assignments, construction contracts and the “contracting out” of services such as pipeline inspection, rehabilitation and laboratory services (Canadian Council of Public Private Partnerships 2001:5), meter reading, revenue collection and maintenance of equipment (Republic of South Africa 2007:24). Service contracts specify an agreed upon cost of the service and must satisfy agreed upon performance standards (ADB 2008:29).

Service contracts, therefore, can have a significant effect on productivity and can be a means of transferring technology from the private to the public sector. These contracts are short-term (usually one to three years), and have low barriers to entry as only a discrete service is required and it is therefore not difficult for private firms to participate. There is also repeated competition as the contracts are short term. Together, these features of the contract put pressure on the contractor to keep costs down (Canadian Council of Public Private Partnerships 2001:5).

The selection of firms in a service contract is usually done through a competitive bidding process. With this model the government remains as the main provider of the service and the private partner only plays a minor role. The private partner generally does not interact directly with the customer and is typically responsible for the project cost, but not the project revenue. In addition, the government bears all the commercial risks and finances any improvements to the system as required (Rashed, Alam & Toriman 2011: 60).

With regard to project financing, under a service contract the government pays the private partner a predetermined fee for the service, which may be based on a one-time



fee, unit cost or some other basis. The contractor's profit increases if it can reduce operating costs while still meeting the required service standards. One financing option involves a cost-plus-fee formula, where costs such as labour are fixed and the private partner participates in a profit-sharing system. The private partner typically does not interact with the consumers. The government is responsible for funding any capital investments required to expand or improve the system (ADB 2008:29).

There are several potential strengths with this PPP model. Service contracts are usually most suitable where the service can be clearly defined in the contract, the level of demand is reasonably certain and performance can be monitored easily. Service contracts, therefore, provide a relatively low-risk option for expanding the role of the private sector. This type of arrangement can have a quick and substantial impact on system operation and efficiency, while providing a vehicle for technology transfer and development of managerial capacity. The short-term nature of service contracts allows for repeated competition within the sector, thereby making the barriers to entry low, given that only a discrete service is up for bidding. Repeated bidding maintains pressure on contractors to keep costs low, while the low barriers to entry encourage participation in the competition (ADB 2008:29–30). In general, service contracts enable governments to accomplish tasks for which there are insufficient demand to develop using internal resources (Canadian Council of Public Private Partnerships 2001:5).

Regarding potential weaknesses, service contracts are not appropriate when capital investments are required from the private sector (Rashed *et al.* 2011:60). The contracts may improve efficiency and release some revenue for other purposes, but the contractor is not under any obligation to provide financing. The effectiveness of the contractor may, in fact, be compromised if other sources of financing, such as government or donors, do not materialise (ADB 2008:30).

The fact that the contractor's activities are discrete and segregated from the broader operations of the company may mean that there is no broader or deeper impact on the system's operations, but only discrete and limited improvements. Additionally, the public sector remains in charge of tariff setting and assets, both of which are politically vulnerable and critical for sustaining the system (ADB 2008:30). Lastly, service contracts do not bring in additional management expertise (Republic of South Africa 2007:23).

For water and wastewater service delivery, a wide spectrum of water service PPP arrangements is possible, with the allotment of responsibility between the private and public sectors varying considerably. The alternative forms are shown in Table 1. To the extreme left, the table illustrates the type of PPP ownership. Operation and maintenance, investment, risks and outputs as well as duration are in the subsequent

Table.1: Spectrum of Water Service PPPs

PPP Type	Asset Ownership	Operations & Maintenance	Capital Investment	Commercial Risk Inputs		Typical Duration
				Inputs	Outputs	
Service contract	Public	Public and private	Public	Public	Public	1-2 years
Management contract	Public	Private	Public	Shared	Public	3-5 years
Lease	Public	Private	Public	Shared	Private	8-15 years
Concession	Public	Private	Private	Private	Private	20-30 years
Build-Operate-Transfer	Shared	Private	Private	Private	Private	25-30 years
Full Privatisation	Private or Shared	Private	Private	Private	Private	Indefinite

Source: Canadian Council of Public Private Partnerships (2001:4)

columns. It is from these columns that we learn if it is the private or public sector that plays a role.

Countries where service contracts in the water sector are in place include the Democratic Republic of Congo, Canada, Columbia, Gaza, Malaysia, Mexico, Puerto Rico, Trinidad and Tobago, Turkey and the United States. Private-sector water utilities provide 99% of the UK's and 75% of France's population with water and wastewater services (Neal, Maloney & Mason 1996:3). The United Kingdom's (UK) transfer in 1989 of all water and wastewater assets to the private sector was driven by the huge need for investment created by impending European Union (EU) standards (Canadian Council of Public Private Partnerships 2001:8). In Ontario, Canada, service contracts in the water sector have been found to offer additional sources of capital, operational efficiencies and cost savings and clear paths of accountability and remedy (Canadian Council of Public Private Partnerships 2001:5).

Sandakan, a city in Malaysia with a population of about 450 000, had one of the highest levels of non-revenue water (NRW) in the 1990s where the level was calculated at almost 60% of system input volume. The city's water board went into an NRW reduction contract with two private companies aimed at reducing real or physical losses from two directions, improving and expanding the current active leakage control activities and replacing the mains with the highest burst frequencies. This contract was for a period of 30 months. During the course of the project about 2 100 leaks were located and repaired. At the end of June 2005, physical losses had been reduced by almost 17.5 million litres



per day (Mld) against the target of 15 Mld. About 11 Mld have been saved through active leakage control and 6.5 Mld by replacement of the mains. This represented a saving of 20% of the total volume of treated water produced (Pilcher 2005).

METHODOLOGY

This study adopted a case study strategy. The strategy enabled the study to focus on a single case and this compelled the researchers to devote careful attention to a specific case (Yin 2004; Creswell 2009:13). Based on the nature of the research problem, this study adopted a qualitative approach for both data collection and analysis. The qualitative tradition however, is based on interpretivism and constructivism, both of which stem from the idealist outlook (Deshpande 1983:101–110; Sale, Lohfeld & Brazil 2002:44–53 cited in Slevitch 2011:76). As such it can be argued that qualitative data in business research provides a more ‘real’ basis for analysis and interpretation (Collins & Hussey 2003:163). To this end, the LMC was selected as the case to be studied.

Purposively selected, the sampling unit, consisted solely of technical and management staff and excluded staff from the Department of Corporate Services. Views were also sought from the WUC customers. Five focus group discussions and six in-depth interviews were conducted. According to Tuckett (2004:2), there are no hard and fast rules regarding sample size in qualitative research. Studies in the field of old age and ageing used experimental cell sample sizes from 10 to 100 with clustering around 50. Others suggest 12 to 20 (Mason 2010:3; Zickmund 2010:3).

Borrowing from Guest, Bunce & Johnson (2006), Mason (2010:3) set 15 as the smallest acceptable number for qualitative interviews. Alder & Alder (2013:8), however, observe that at the low end of “how many” questions, numerous well-respected and even classic studies have been produced using the single case study with some of the studies having relatively few people, such as between 6 and 12 respondents.

SOURCES OF WATER FOR THE LOBATSE MANAGEMENT CENTRE

The water sector at the LMC and in the rest of Botswana was adversely affected by drought in 2011, 2012, 2013 and 2015. The rainfall patterns were at their most unpredictable leading to a drastic reduction of water in rivers and dams. The underground recharge was also weak (Rosen n.d), with most surface water lost through evapotranspiration. The WUC stepped up water restrictions and rationing but the water situation

deteriorated over a three-year period. Anecdotal evidence suggests the drying up of Nnywane Dam and most of the boreholes in the LMC.

With reference to dams, the LMC is mainly dependent on water from Gaborone Dam, which receives water from the Notwane River. This dam also receives water from other areas in the northern parts of the country through the North-South Water Carrier (NSWC) pipeline. The water routed through the NSWC is from other dams including Letsibogo, which has the largest storage capacity. The Molatedi Dam, which is adjacent to the Gaborone Dam, is located in the neighbouring Republic of South Africa, provides a quota of its water to the Gaborone Dam. The Nnywane Dam is located within the LMC and is another source of water for the area and is located just a few kilometres from the town of Lobatse.

Boreholes are the next largest suppliers of water in the majority of the villages. While some respondents mentioned reservoirs as their alternative source of water, a reservoir is just a storage facility and the real source of water is boreholes. Only a few respondents said that they draw water from streams when their water supply is disrupted. Some members of the community, whose nearest borehole is 10 km or more away, find it difficult to fetch water themselves and, as a result, rely on fellow villagers who fetch water on donkey carts and sell it to their neighbours.

The LMC area receives about 90% of its water from the Gaborone Dam, while 10% of the water comes from the Nnywane Dam, which is located in the LMC area. Although water was reported to come from the Gaborone Dam and other dams in the North, it has been reported that water levels are low within the Dam, a factor that sometimes leads to water shortages in the LMC area.

Reservoirs in the Good hope area were also said to acquire water from the Gaborone dam for storage before it is ultimately distributed to individual customers. The disparity in the information received with regard to water coming from either Gaborone or Lobatse is that the water is supplied only to the Good Hope Senior Secondary School, while the rest of the village and other areas are supplied with water from a borehole at the nearby village of Kgoro. It was also indicated that water from Gaborone or Lobatse is supplied to villagers as well. This, provides an overview of water sources in the Good hope area.

Although the 'JOJO'¹ and other elevated tanks are technically not sources of water, they are storage and transportation resources. Some of them are located in high areas such as plateaux and hills. At the time of collecting data it was established that the WUC often supplied water through water bowsers. The only controversy is that the majority of WUC customers at the LMC stated that they find water for themselves



when there is a shortage. They decried that there is no water supply at all when there is a shortage. A staff member of the WUC, however, explained this intervention for the water shortage, thereby contradicting the customers' assertions.

The WUC often supplies water by means of water bowsers when there is a shortage and use that water in certain areas where boreholes have dried up. Clarity was also provided regarding treated water being distributed to the LMC. Communal dams constructed by villagers are another source of water.

Boreholes are a conventional source of water in both urban and rural areas. However, some of the boreholes at the LMC are said to be not in operation. The reasons advanced for this problem range from drying up, contamination and capping to vandalism. Whereas some areas are supplied through various sources, others are supplied solely by water from boreholes, a factor that is now problematic as a number of boreholes have dried up. Water in these areas is currently supplied by bowsers and tanks. Controversy arising from the use of boreholes emanated from data provided by residents of the LMC, including village leadership who were adamant that some of the boreholes could still produce adequate water despite being capped by the water authority. These sentiments were more perceptible in the villages of Good Hope, Molapowabojang, Digawana, Otse, Mogojogojo and Pitsane.

Other boreholes in the LMC experienced frequent pipe bursts leading to closure. A middle manager confirmed that boreholes are an alternative source of water, but confirmed that many boreholes were out of use. Related to the closure of boreholes due to drying up, was the issue of supplying water from the dams to affected areas. It was mentioned that boreholes in the Lobatse area had a low supply capacity.

The demand by participants in the study to re-open capped boreholes in the LMC area to augment the current water supply in affected villages was repeated throughout a number of interviews. In some cases the villagers indicated that some of the boreholes were being capped despite still yielding water. A case in point is the villages of Mogojogojo and Molapowabojang, where several boreholes within the vicinity of the villages were capped when the take-over began in 2011. Staff at WUC indicated that they were, however, not sure about the availability of water in some of the boreholes. Other respondents (villagers) indicated that they had been informed that the capped boreholes were contaminated.

Self-made community dams are also a source of water. These are dams constructed either by the communities themselves or with the use of machinery supplied by local authorities. These are the least popular sources of water in the LMC as there are not

many of them. These dams are helpful as some retain water throughout the dry season, if water use is managed well. The main problem with these dams is their tendency to dry up when the drought season drags on for too long. One of the largest of these dams in the LMC is located at Mogobane Village. This dam has existed for years now and villagers still rely on it for water, especially for domestic use and watering of domestic animals.

This state of affairs resulted in the WUC experiencing challenges that varied in nature and magnitude. Whilst some were business related, others were purely administrative. Business related challenges include performance in terms of water supply and service.

CHALLENGES TO PUBLIC PRIVATE PARTNERSHIPS AT THE LOBATSE MANAGEMENT CENTRE

The water situation in the LMC area remains a major cause for concern and a number of problems can be attributed to existing the state of affairs. Challenges discussed below include water supply, infrastructure and operations.

Water supply challenges

A lot of water at the dams is lost through seepage into the ground but Botswana also has one of the highest rates of evapotranspiration in the region. In the years 2012 through to 2015 Botswana experienced one of the most severe droughts in recent history with water scarcity affecting both citizens and animals countrywide. Consequently, the saying '*Botswana o a kgala*', loosely translated as 'Botswana is drying up', became synonymous with a lack of water. Due to the scarcity of rain the Nnywane Dam went dry, guaranteeing no water to supply the demand in the LMC area. This meant that if there was no water supply from the Gaborone Dam, parts of the LMC reliant on the supply from Gaborone would go without water.

Recurring and protracted droughts were also blamed for worsening the water situation in the LMC area. Closure of water pipes to limit the water supply was another challenge. Water supply limitation had similarly been instigated where there is a shortage in the water supply and where applicable water pumps have been shut down to limit water consumption. Water was rationed by scheduling supply on different days in all villages in the LMC. This practice was planned to continue for the foreseeable future.

The lack of sufficient rain was mentioned as a factor contributing to the water shortage. The situation has been worsening as water levels in dams are dropping steadily. The WUC also claims that it inherited an obsolete infrastructure from the DWA and



councils. The infrastructure in question was originally intended solely for supplying the towns. The subsequent decision to also service villages with the same infrastructure resulted in the supply of water being below capacity or at capacity level.

One of the water supply challenges is the scarce rainfall coupled with high water demand. This results in a drastic reduction of water levels in dams, boreholes and reservoirs mainly due to protracted droughts. The rains remain erratic and unreliable.

Infrastructure challenges

Broken down water pumps compelled the organisation to ferry water to customers by means of browsers. Where borehole engines and pumps had broken down, the water shortage was often exacerbated by the North-South Water Carrier pipe burst. The pipeline would occasionally burst due to occasional operation at capacity.

Some of the challenges faced are specific to water supply and distribution. Incidences of vandalism and theft of pipelines, boreholes and of other WUC property such as borehole engines and fittings contributed to severe water shortages. It was also alleged that some villagers punched holes on the surfaced pipelines to get water for their livestock. Target areas are typically remote. A case in point is the pipeline that runs from the town of Lobatse to Good hope Village. Adding to these frustrations are recurring power cuts. Botswana relies on electricity purchased from the neighbouring RSA (see Table 2). A power shortage in RSA (Joffe 2015; Wassung 2010:9), and recurrent burning of Morupule Power Station boilers resulted in a decrease in the supply to Botswana and operations relying on electricity are regularly disrupted. Power cuts also affect water supply as most pump stations with water pumps and generators are electrically operated. The water supply for the LMC is from Gaborone through Taung Station near Ramotswa, meaning that power cuts at any of these locations affect supply to the LMC. Power cuts also cause problems in the greater LMC area. Villages around Lobatse cannot be supplied with water during power cuts as the pumps would not be functional. For the villagers, it is not so much the breaking down of a borehole that is problematic but the turnaround time taken to repair the borehole engines. They allege that some engines are left unrepaired for long periods despite reports being made.

As illustrated in table 2, Botswana is one of the largest consumers of electricity from neighbouring South Africa in terms of Gigawatts (GWh). Other countries in the region import relatively lesser power than Botswana.

Another visible challenge is that there is no pipeline coverage in newly-occupied areas. Where the infrastructure is non-existent, new customers are forced into paying high fees.

Table 2: Trading of Electricity in the Southern Africa Region

International sales to countries in southern Africa, GWh					
Number of Eskom customers	2014/15	2013/14	2012/13	2011/12	2010/11
Botswana	1 237	1 608	2 574	2 498	2 377
Lesotho	230	213	255	184	247
Mozambique	8 360	8 314	8 284	8 265	8 523
Namibia	924	1 248	1 822	1 507	1 559
Swaziland	882	741	598	596	564
Zambia	16	143	253	134	23
Zimbabwe	108	154	3	7	0
Short-term energy market 2	243	48	2	4	3
Total	12 000	12 469	13 791	13 195	13 296

Source Eskom List of Fact Sheets, 2015

An organisation will often measure the distance from the new plot in which a connection is to be made to the nearest pipeline. Areas with no pipe network are those that are newly-occupied. In Botswana the disparity between un-serviced land and the demand for water connection by customers emanates from the reality that land servicing is a mandate of the DWA and not the WUC and customers often find themselves having to wait for long periods before their land is serviced. As a result customers have to pay huge fees as the nearest pipe from which they can be connected is usually located far from their households.

An organisation can adopt various ways of connecting new clients to an existing pipeline. One way is by going into partnership with a private company as this can bring efficiency to the delivery of services. As the WUC initially serviced towns while other areas were serviced by other authorities such as the DWA and Councils, such areas have a good pipe network. However, since the take-over the arrangement that each individual has to dig his own trench has been abandoned. There is a lack of pipeline coverage in newly-established plots, a factor that is not helped by a lack of manpower in the WUC, leading to a backlog in new connections.

Dam and reservoir capacity can be a factor affecting the areas in which they are located, particularly if that area experiences an increase in population. It is important for organisations to accurately forecast the population of a particular area when constructing a dam. This forecasting can be done with reference to past national census reports that can help to predict population in years to come. Reservoirs should also be contracted with the possibility of population expansion being taken into consideration. At the LMC the majority of



reservoirs now appear small as population increase has rendered the capacity of reservoirs inadequate. A case in point is that of the Molapowabojang village that outgrew its reservoirs and where bigger reservoirs had to be constructed. Small reservoirs and dam capacities are contributing factors that lead to available water being depleted faster in the LMC.

At the LMC the quality of some of the pipes in the network are poor as they were manufactured from inferior material. This leads to recurring bursts and leakages, largely contributing to water shortage. The repeated bursts and leakages have been consistently attributed to the poor infrastructure inherited from the DWA.

Following a reform, when a new authority takes over from another, a reconnaissance exercise can assist to uncover the state of an existing pipe network. The new authority can choose to rehabilitate the existing network. This can be done through entering into partnership with a private company. Rehabilitation of a network need not necessarily result in pipe replacement as this may not bring Value for Money (VFM) and the new authority can choose to rather make repairs.

The majority of respondents from the group discussions emphasised the problem of leaking pipes in their areas of work. They stated that in most cases they fix or rehabilitate the pipeline.

Although residents of the LMC know that there is shortage of water in the country, some continue to misuse and waste water. While respondents acknowledged that pipe bursts and leakages result in water shortages, some residents accused others of improper water usage.

Operational challenges

The challenge of the backlog in new connections was cited as being critical. The water situation was reportedly made worse by delays in new connections, a factor exacerbated by the fact that the present authority utilises its own resources to dig trenches for individuals, as opposed to previously when customers were allowed to dig their own trenches. This previous arrangement hastened connections.

Currently, private companies are engaged to dig trenches and this has proved to be problematic as WUC members have to supervise these companies despite staff shortages.

A shortage of company vehicles, including JCBs, was also cited as a challenge. When the WUC took over water services, some of the equipment and assets were left behind with the previous authorities, including some vehicles. Consequently the WUC

experiences a serious shortage of transport despite efforts to purchase new vehicles after the take-over. The shortage of vehicles was evident at all three WUC stations within the LMC. In addition to the shortage of transport, it was also observed that there is a shortage of water bowsers, machinery, excavators and tanks. It was mentioned that there is only one JCB servicing the entire LMC.

With regards to billing, the water billing system has been criticised by members of the public as producing water bills that are too high. The WUC management, however, stated that the difference between the current billing system and the previous one is that WUC depends on tariffs to break even, whereas the previous authorities could spend months without billing their clients. The current authorities bill clients on a monthly basis and apply measures such as disconnecting meters to recover costs from the public.

Private companies could be engaged to take over the billing aspect of the water service. Parastatals such as the postal services can serve as pay points for customers so that customers do not have to travel far to pay their bills. Residents of the LMC are, however, not aware of the fact that the billing system belongs to the WUC and not any other party that serves as a pay point. It is the billing system at the WUC that issues high bills, resulting in customer discontent.

INTERVENTIONS BY THE WUC DURING WATER SHORTAGES

Public education

While some of the residents at the LMC stated that no announcements are made to them when there are planned water cuts, it was observed that public announcements (PAs) are utilised to inform the public of impending water cuts when maintenance is carried out in a bid to prepare them for the short period when water will be unavailable. Communication is a key component in any organisation, particularly one that has a wide client base. Where there are interruptions in the provision of services, organisations should have a clear communication strategy and a well-built communication mechanism. Announcements can be made via radio stations. However, addressing the public directly using PA systems on vehicles is much more effective.

Other interventions

In light of water shortages at the LMC, it was reported that the corporation had put measures in place to reduce water use. The corporation first introduced a water



rationing exercise with water being shut off during stipulated hours. This rationing was exercised between 08:30 and 15:30 and the schedule included the town of Lobatse and various villages on different days. In the event of water levels continuing to drop beyond expectations, water rationing can be implemented. This can be done in various ways but scheduled rationing coupled with public announcements, can prove very effective. Customers will know well in advance when water will not be available in their area and prepare for the outages by storing enough water to last until supply is resumed.

At the LMC the WUC introduced water restrictions with a view to save water. The public was notified of the restrictions, which included prohibition of lawn watering, washing cars and filling swimming pools. The programme is derived from the national programme and is now implemented throughout the year rather than being confined to periodic implementation as was previously the case. The monitoring enforcement of the programme, however, is not as strict as it was planned to be due to a lack of capacity. Organisations can develop a water restriction programme as a first attempt to reduce the amount of water consumed. The programme has to be comprehensive with a strict monitoring and enforcement component. The programme can also have punitive measures as a deterrent for customers who continue to misuse water.

The drying up of boreholes prompted a decision to connect areas previously supplied solely with water from boreholes to the main pipeline that runs from Gaborone to Lobatse. This greatly affects the capacity of the infrastructure. The increase in the number of villages connected to the main pipeline strains the supply itself as the size of the main line has not been increased. While supply was previously maintained at a manageable capacity, the situation has now changed to put the pipe to full capacity all the time.

The supply of water through the use of water bowsers is not erratic. The WUC has devised a schedule that serves the LMC area. Villages that have a regular supply of water are serviced when the need arises. A senior manager explained that bowsers are brought into play as soon as a report of a water outage reaches the area office.

Study participants put forward suggestions geared at curbing the problem of the vehicle shortage in the LMC area. They suggested that villagers should excavate trenches and that the corporation should contract employees with vehicles to use their vehicles for WUC business. There were contrasting views that there really was no shortage of vehicles within the corporation as one vehicle could be utilised to ferry more than one crew.

OPPORTUNITIES

This study has identified five key performance areas that require attention in order to improve the provision of water in the LMC. These areas include: adequate resourcing of satellite stations, contracting private companies, reviewing the WUC billing system, initiating agreements with private companies and resuscitating alternative sources of water.

What can be done to improve service delivery at the LMC?

The primary cause of water shortage is leakage resulting from dilapidated pipes. A Republic of Botswana (2009b:13) report documented water loss through pipe leakages and bursts—unaccountable water usage—at 24% in 2007. The problem persisted in 2013/2014. Water loss reduction seems to be the most viable solution to this problem. A practical example elsewhere is the Malaysian City of Sandakan in which physical losses were reduced by almost 17.5 million litres per day (Mld) following a 30-month contract (Pilcher 2005).

The second key performance area is the contracting of private companies to carry out specific tasks. From the interactions with residents of the LMC, the majority of the respondents indicated that they would like private companies to be contracted for the delivery of water. A few respondents, however, said they did not see the need to contract private companies. Members of the community indicated that they had confidence in private companies, citing efficiency as the main reason for their choice. Some indicated that they were aware that a private company could demand higher charges, while some likened the WUC to a private company as compared to previous authorities (the DWA and District Councils). The conclusion is that there is a need to contract private companies so as to improve the delivery of water services in the LMC.

The WUC billing system is the third area in which performance at the LMC can be improved. The majority of the LMC residents indicated that they were not happy with their billed amounts. Associated with the billing system is the lack of access to bills as well as convenience in paying bills. The establishment of service points in some of the villages can help improve the delivery of services.

The fourth performance area for consideration is initiating agreements with private companies. The lack of any form of agreement between the WUC and private companies providing generators or servicing either pump stations or borehole engines places the performance of the corporation at risk.

The last is the option of increasing alternative water sources. The WUC has to explore increasing alternative sources of water and ensure equitable distribution of water within the



LMC. According to the majority of the respondents from both the WUC and community categories, Gaborone Dam is the main source of water known to them. However, other respondents mentioned dams such as the Letsibogo, which has the largest storage capacity while some mentioned Nnywane Dam, which is within the LMC, a few kilometres from the town of Lobatse. Respondents were, however, not aware that Molatedi Dam in the neighbouring Republic of South Africa provides a quota of its water to the Gaborone Dam.

Boreholes are the next major suppliers of water after dams in the majority of the villages. While some respondents mentioned reservoirs as their alternative sources of water, it is common knowledge that a reservoir is just a storage facility and the real source of water, in their case, is boreholes. Only a few respondents mentioned that they draw water from streams when their water supply is disrupted. Arguably, some members of the community whose nearest borehole is 10 km away and beyond find it difficult to fetch water and, as a result, rely on fellow villagers who fetch water in donkey carts for sale. One unit of water (approx. 20 litres) costs P20 (approximately US\$2) at the time of data collection.

Regarding water shortages, the majority of the LMC residents indicated that they look for water themselves when there is no supply. This development was witnessed in some of the villages such as Pitsane, Molapowabojang and Mogobane at the time of conducting the study. It is crucial that capped boreholes be opened for re-use wherever feasible.

Areas where private companies can be contracted

The findings of the study revealed areas where private companies can be contracted. Repair and maintenance of boreholes were at the forefront of the options provided. For the WUC personnel, the area which caused concern was the provision of new pipes linking villages that frequently leaked due to dilapidation. The next preferred area respondents felt should be contracted to private companies is water bowsers when there is a water shortage. In fact, members of the community strongly felt that there were individuals within the villages who could, if financed, purchase water bowsers and then provide water for their villages.

The third area that members of the community would like to have contracted to private companies is the distribution of water within villages. This is in line with the findings of other studies, which reveal that water shortage in some villages is actually secondary to the main problem of distribution (*Sunday Standard* 2012).

The fourth area is billing. Billing, particularly in urban areas, is the largest concern reported to the WUC, superseding the shortage of water. Members of the community

shared the same sentiments. In the villages, overrated bills seem to appear worrisome too, especially with frequent water shortages.

Anecdotal evidence is that some respondents in Goodhope, Pitsane, Mogobane and Digawana alleged that when their taps are opened, the meter continues to run even if there is no water coming out, just air. Meter readers in Goodhope mentioned that they were occasionally refused drinking water by clients whilst out to read meters – the clients decried receiving high bills despite the lack of water. Similar anecdotal evidence in the village of Moshopha in the Tswapong district, has it that residents refused to pay water bills as they claim they never had any water flowing from their taps.

ANALYSIS OF KEY FINDINGS

The implementation of the WSR was an ambitious project that did not take the aspect of time into serious consideration. The implementation was started in a hurried manner and gave rise to a host of undesirable outcomes. An interim measure during the takeover, such as private companies providing requisite activities (possibly through PPPs) like maintenance and repair of boreholes and reduction of leaks, was necessary. The takeover implied that there would be a transitional phase where government would be relocating the water services from the DWA and District/Town Councils to the WUC.

The lack of a specific sector diagnostic analysis at micro-level was a serious impediment to addressing the implementation issues that the WUC encountered during the takeover. These findings corroborate the ADB's position (ADB 2008:11), that a sector diagnostic analysis provides a realistic assessment of current constraints and subsequently creates a basis for possible solutions. A sector analysis also provides clarity on legal, regulatory and policy frameworks; technical issues; institution and capacity building and commercial, financial and economic issues, among others (ADB 2008:50).

Failure to adequately and timeously address the frequent bursting of main pipes and leakages of smaller pipes as major causes of water shortage are also a clear indication that the WUC is incapacitated in terms of capital. Lack of capital implies that the corporation cannot provide water effectively. This calls for measures to be put in place to address water leakages. In this situation, the WUC is faced with the challenge of raising capital through means other than subsidy from the fiscal budget to finance the reduction of water leakages and replace dilapidated infrastructure.

Regarding project financing, governments usually fund a project ahead of its implementation (ADB 2008:29). As documented by the Canadian Council for PPPs



(2001:5), the fact that government pays a predetermined fee compels the private companies to maintain low operating costs so as to make a profit. The WUC, however, has to maintain strict monitoring to ensure that a contracted company meets the set standards. Unlike long-term contracts, it is not common in shorter term PPPs for a private company to renegotiate its contract seeking to supplement the initially agreed upon fee.

While the WUC's main source of funding is the fiscal budget, research has shown that public financing is volatile and in many countries rarely meets crucial infrastructure expenditure requirements in a timely and adequate manner (Organisation for Economic Cooperation & Development 2014:44–50). Elsewhere, research has shown that equity is a more readily available component in the financing of infrastructure projects (Organisation for Economic Cooperation & Development 2014:9), as raising large amounts to finance large-scale projects is a challenge for most debtors. As a result, engaging a private company to provide infrastructure for water delivery in the LMC is a viable option given the limited finance from the government. In addition to providing infrastructure, other aspects such as water bowsers and additional pump stations can be provided under PPP contracts.

Performance-based payments are a crucial tool for performance in PPPs. Lack of existence of PBPs in the LMC provides grounds for potential conflict between the WUC and private companies regarding payments.

Policy-wise, the centralisation of the water supply and distribution to the WUC clearly demonstrates the government's decision to move away from privatising the aforementioned service. A suitable solution to the problem that will not work against the government policy, is desirable. Such an option may include a tailor made PPP model relevant for the LMC. In a conventional PPP contract, a project may be subject to a variety of risks including political, legal, government credit, market demand change, inflation, product price, poor management forecast, contract, financing, absence of support infrastructure and technical risks.

On staffing, the WUC enjoys prominence of technical expertise across cadres as it is a parastatal set up to operate on a commercial basis. It is understood that remuneration packages at WUC are much better than those provided at the other two former authorities, making it attractive for people with higher expertise and experience. While the WUC-LMC enjoys this diversity of expertise in technical staff, the findings reveal that the Centre experiences a shortage in terms of the adequacy of staff. As mentioned by management at the LMC regional office, this shortage contributes substantially to the poor performance of the entire Centre.

RECOMMENDATIONS

These recommendations relate specifically to the applicability of PPPs in the water sector at the LMC. They are based on the findings of the study and should be understood to have been relevant at the time during which the study was conducted. In implementing the recommendations, caution should be exercised as some may not be valid in future. At the time the reader accesses this research, the implementing authority may have already implemented some of the programmes or actions relating to the following recommendations.

The WUC should implement the maintenance and repair of boreholes and pump stations more efficiently. It has become a norm that supplies of water are cut from a particular location and, in some instances, more than one village for periods ranging from hours to weeks. Consumers often find themselves in a situation where they have to find water for themselves when there is no supply. This prompts the consideration of private companies being contracted.

The WUC-LMC should review its business and administrative processes so as to improve service delivery. By reviewing its business and administrative processes, the WUC will consequently discard those processes that are outdated. Equally, the WUC will introduce new processes that are up to date with modern day business and administrative operations.

It is imperative that the WUC sets up its own fuel points in the LMC. This will reduce transaction time and costs for the WUC. Fuel storage facilities should be constructed on the premises of each of its satellite stations. The rationale behind this is to avert consequences brought about by fuel shortages, particularly in areas where fuel supply is dependent on privately-owned fuel stations. Fuel stations, in most cases, have low storage capacity and run out of fuel frequently.

Unused and capped boreholes should be rehabilitated and used again. Most dams constructed on rivers are intended for urban water supplies. Groundwater resources are used throughout the country for livestock, domestic use and small areas of irrigation. The resources are geologically old and quality is often affected by salinity and concentrations of fluorides, nitrates and other elements (Matlok 2008:1). It is estimated that more than 21 000 boreholes exist in the country, but many are not used and are capped. Groundwater supplies two-thirds of the total water consumption while the rest is provided by other sources (Matlok 2008:1).

It is crucial for the WUC to have a definite model to follow in contracting private companies. With a model in place the WUC can, among other things, easily



determine value for money, expedite the process of contracting and have clarity on ownership, financing and management responsibilities beforehand. With that said, the WUC should carry out a sector diagnostic analysis prior to entering into a PPP contract. This is in line with the ADB (2008:14), which stipulates that for a PPP to be successful, it must be built upon a sector diagnostic analysis that provides a realistic assessment of the current sector constraints. Specifically, the diagnostic analysis should cover technical issues; legal, regulatory and policy frameworks and commercial, financial and economic issues. A sector diagnostic analysis helps the government to assess the status quo, identify gaps and weaknesses, and develops a sector reform strategy or road map that outlines the tools and activities required for reform. In view of the foregoing, a sector diagnostic analysis should enable the WUC to compile reports on the water supply data of each village and draw up a planned long term solution accordingly. The solution may comprise a 20 to 30-year plan.

CONCLUSION

This study assessed the applicability of PPPs in the water sector in the LMC. The study answered critical questions through: an assessment of the water situation in the LMC in the years 2011 to 2015; water supply and distribution challenges experienced and the identification of potential opportunities available for the improvement of service delivery. These would provide an opportunity to isolate what can be done to improve the provision of water at the LMC. It is without doubt that PPPs have emerged as the panacea for provision of public infrastructure and services. In the developing world, countries have so far experimented with various methods of privatisation and the results have often been disappointing. That private companies can assume substantial financial, technical and operational risks in design, financing, building and operation of projects is an appealing feature that makes PPPs a preferable choice. With this in mind this study concludes by highlighting the preference of private sector participation in certain areas of the economy. The development of PPPs in Botswana is significant for the growth of the country's economy. The implementation of PPPs will remove the burden of government having to provide a development budget for the provision of infrastructure and service delivery.

NOTES

1. Jojo is a brand name for some water tanks. The tanks popularly called 'Jojo' by users are usually green in colour and made of PVC material.

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