

Improving Free Basic Water Provision in South Africa

Prepared for the
Financial and Fiscal Commission, Republic of South Africa

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Foreword

This report is the result of collaboration between the Robert M. La Follette School of Public Affairs at the University of Wisconsin–Madison, and the Financial and Fiscal Commission of the Republic of South Africa. This study has provided graduate students at La Follette the opportunity to improve their research and policy analysis skills while producing a report that contributes to the work of the Financial and Fiscal Commission.

The La Follette School offers a two-year graduate program leading to a master’s degree in international public affairs. Students study policy analysis and public management with an international and global perspective, and they pursue a concentration in a policy focus area of their choice. They spend the first year and a half of the program taking courses in which they develop the expertise needed to analyze public policies.

The authors of this report are all in their last semester of their degree program and are enrolled in Public Affairs 860, *Workshop in International Public Affairs*. Although acquiring a set of policy analysis skills is important, there is no substitute for doing policy analysis as a means of learning policy analysis. Public Affairs 860 gives graduate students that opportunity.

The students in the workshop were divided into four teams. The authors of this report were assigned to work on a research project for the Financial and Fiscal Commission. The topic of this report—an analysis of the financing of municipal government provision of free basic water—was proposed by Dr. Ramos Mabugu, Director of the Research and Recommendations Program at the Financial and Fiscal Commission.

The South African constitution establishes access to potable water as a basic right for all South Africans. To implement this constitutional right, the government of South Africa enacted a policy of “free basic water” that declares that all poor households are entitled to receive a limited amount of potable water free of charge. The responsibility for providing water falls to municipal governments. Each local government faces the task of financing the provision of water and fulfilling the government’s commitment to free basic water for all poor households. To understand the successes and failures of the water delivery and pricing system in South Africa, the authors of this report conducted in-depth case studies of the financing of water delivery in three mid-sized South African municipalities. Although data problems prevented them from completing a comprehensive analysis, they identified a number of key data elements that are needed to fully assess each government’s ability to provide free basic water for all of its low-income residents.

This report would not have been possible without the support, encouragement, and assistance of Dr. Mabugu and of Mr. Eddie Rakabe, Senior Researcher in Fiscal Policy at the Financial and Fiscal Commission. I thank them for their contributions.

The report also benefited greatly from the support of the staff of the La Follette School. Mary Mead and Gregory Lynch contributed logistical and practical support, and Karen FASTER, the La Follette Publications Director, edited the report and managed production of the final bound document.

By involving La Follette students in the tough issues challenging governments around the world, I hope they not only have learned a great deal about doing policy analysis but have gained an appreciation of the complexities and challenges facing governments at all levels. I also hope that this report will contribute to the work of the Financial and Fiscal Commission and to the ongoing public debates about how best to finance the delivery of basic public services to those most in need.

Andrew Reschovsky
May 2009
Madison, Wisconsin, USA

Acknowledgments

We wish to thank certain individuals who contributed greatly to the analysis contained in our final report. Dr. Ramos Mabugu and Mr. Eddie Rakabe, from the Republic of South Africa Financial and Fiscal Commission, provided us with a fascinating topic and assisted us in developing the scope of the project. We thank them for the opportunity to learn about municipal water provision in South Africa and hope we were able to add value to their ongoing analysis of water services policies. We also extend our thanks to Karen FASTER, our publication editor, who provided incredible help in revising and editing our report. Her patience and attention to detail ensured our final product was of the highest quality. Lastly, we give our sincere thanks to Professor Andrew Reschovsky, our faculty advisor, who provided us with continual guidance and support for the duration of this project. He deftly helped us formulate the scope of our project and made sure we stayed on the right track throughout this semester. Without his mentorship and guidance this report would not have been possible.

Executive Summary

Since the establishment of a new democratic government in 1994, South Africa has worked toward reducing standard of living disparities that existed between white and black South Africans under apartheid. Access to basic amounts of clean water was one area of inequity between the races. In 2001, President Thabo Mbeki established a Free Basic Water (FBW) policy that directed municipalities to provide poor households with access to sufficient water free of charge (Department of Water Affairs and Forestry, 2002b, p. 7). The Equitable Share, a government grant that redistributes tax revenue from the central government to the provinces and municipalities, was designed to help municipalities cover the costs of providing basic services, such as access to clean water, to their poor households (Department of Provincial and Local Government, 1999). Government policy directed municipalities to provide and price water in a way that would generate enough revenue to cover the operating and maintenance costs of providing water not met by the Equitable Share and other grants (Department of Water Affairs and Forestry, 2002a).

In this report, we evaluate municipal FBW policies in South Africa. Our evaluation focuses on the dual goals of providing basic water to poor citizens and of recovering the costs for providing water services. We examine FBW policies by conducting case studies on three South African local municipalities: Polokwane, Mbombela, and Rustenburg. We investigate the ability of each municipality's water tariff structure to achieve cost recovery while implementing its FBW policy. Given that the three municipalities do not yet provide FBW to all poor households within their jurisdictions, we also assess whether their current water tariff structures would likely achieve cost recovery if FBW were expanded to the remaining poor households.

We find that significant progress has been made in expanding access to basic water across all three municipalities. Between 2001 and 2008, each municipality reduced its backlog of households without access to municipal water by at least 6 percentage points (Department of Water Affairs and Forestry, 2009b). After reviewing each municipality's tariff policy, we conclude that it would be difficult for Polokwane and Mbombela to cross-subsidize substantially to recover the costs of providing FBW to the remainder of its poor households that lack it. These municipalities have relatively small proportions of wealthier households needed to consume water at higher tariff rates to subsidize the relatively large proportion of poor households. We make this observation with caution, because the fiscal data on consumption levels, costs of water, and budgetary details essential for conducting a thorough analysis were unavailable to us. However, we found a large amount of background information that allowed us to gain a general understanding of water service provision in South Africa, especially in our three municipalities. With this knowledge and our limited analysis, we were able to make recommendations for further research and study on FBW provision in South Africa.

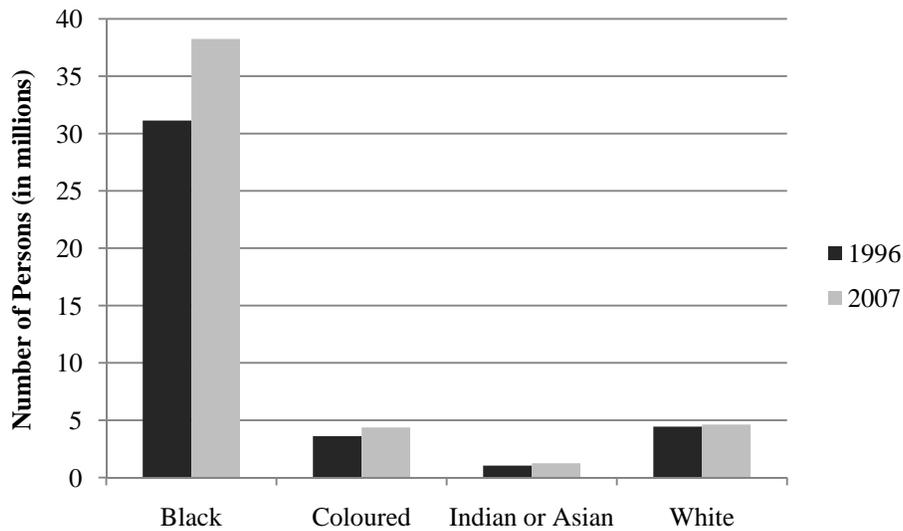
Introduction

Since the establishment of a new democratic government in 1994, South Africa has worked to reduce standard-of-living disparities that existed between white and black Africans in the era of apartheid. The Reconstruction and Development Programme (RDP) was the overarching socioeconomic policy framework created by the African National Congress soon after the government of Nelson Mandela assumed power. The five primary policy programs of the RDP were “meeting basic needs; developing our human resources; building the economy; democratising the state and society, and implementing the RDP” (African National Congress, 1994). Such broad goals have proved difficult to accomplish in the near term, although much progress has been made since then, especially in meeting basic needs.

One of these basic needs is access to clean water. Water is a finite and scarce resource in semi-arid South Africa. Uneven distribution of rainfall and the low availability of groundwater make the management of water resources a significant challenge (Department of Water Affairs and Forestry, 1994). This problem was exacerbated in the apartheid era because white African landowners effectively had a monopoly on water resources. According to the South African Department of Water and Forestry (DWAF), “the development of South Africa’s water resources has been linked more with supporting the progress of the country’s wealthy sector than with alleviating the position of the poor, particularly in the rural areas” (Department of Water Affairs and Forestry, 1994, p. 4). It should be noted that policies of the apartheid era ensured that “poor” became almost synonymous with “black Africans.”

To understand the extent of standard-of-living disparities regarding access to water, it is necessary to know the distribution of race in the population of South Africa. Figure 1 shows the population in South Africa by racial group in 1996 and 2007.

Figure 1. South Africa Population by Racial Groups (1996, 2007)



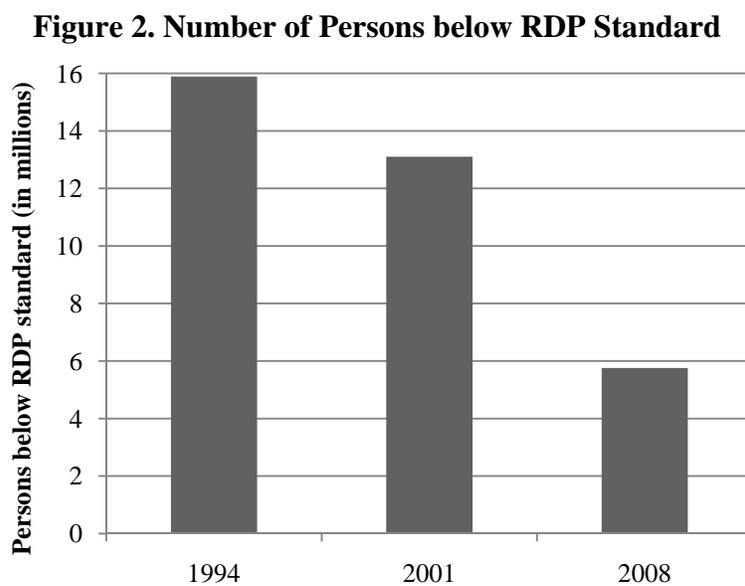
(Statistics South Africa, 1996; Statistics South Africa, 2007)

Just more than a decade ago the white minority enforced legal segregation in almost every aspect of South African life. The provision of basic services in a white community was similar to most developed countries, while a neighboring black community sometimes barely received services at all. The 1994 DWAF White Paper references statistics originally published in a World Bank survey of 9,000 households throughout South Africa that highlighted some of these disparities. The survey found that over 95 percent of Coloured, Indian/Asian, and White homes had some form of piped water (internal household water or yard taps) compared to 43 percent of Black African households (Department of Water Affairs and Forestry, 1994, pp. 3-4).

Despite these inequities of water access that existed at the end of apartheid, significant steps have been taken to alleviate these conditions. In 1996, the new constitution for the Republic of South Africa was approved. Section 27 identifies access to sufficient water as a right of its citizens and states that this right must be achieved progressively over time “through reasonable legislative and other measures” (Republic of South Africa, 1996). To further clarify the responsibilities of government in providing this right to basic water, the South African Parliament drafted and passed the Water Services Act in 1997. This document charges municipal governments with the responsibility of providing basic water services to the residents in their jurisdictions. However, this document did not establish strict implementation timelines for municipalities to follow; rather it presented guidelines on basic water provision and pricing techniques. It was not until 2001 when President Thabo Mbeki established a Free Basic Water (FBW) policy that municipalities began to actively pursue their own policies to ensure this right. A baseline standard that had been developed in the Reconstruction and Development

Programme for potable water provision was adopted as the minimum level of service provision (commonly referred to as the RDP standard).¹ Six thousand liters of potable water per household per month was determined to be the minimum amount of water needed to meet the basic needs for a household of eight people, assuming the need for 25 liters per person per day.² Additionally, 200 meters was the maximum distance that the water source could be from a dwelling, and 10 liters per minute was the minimum flow rate that could still be considered meeting the basic water service standard (Department of Water Affairs and Forestry, 1994).

Figure 2 displays the significant progress South Africa has made in reducing the backlog of citizens below the RDP standard.



(Department of Water Affairs and Forestry, 2009b)

Despite this, many of the poorest households still do not benefit from the FBW policy, nor do they have access to appropriate infrastructure such as piped water or other protected water sources. Many municipalities have had challenges with

¹Potable water is defined as water supplied by Water Services Providers that is intended for use as drinking or for domestic purposes and consistent with South Africa's Specifications for Drinking Water (Republic of South Africa, 2003).

²Twenty liters per capita per day is considered by the World Health Organization to be the minimum quantity of water needed to meet a person's most basic needs. At this quantity, sufficient water consumption, hand washing, and basic hygiene should be possible, while laundry and bathing requirements would be difficult to meet. Fifty liters per capita per day is considered sufficient to meet consumption, hygiene, laundry and bathing needs (Howard & Bartram, 2003).

financing new infrastructure projects and creating fair tariff schemes to both provide and help pay for the FBW programs.³

In this report, we evaluate municipal FBW policies in South Africa. Our evaluation focuses on the dual goals of providing basic water to poor citizens while recovering the costs for the municipal water services provided. Cost recovery is achieved when a municipality is able to fund all operating and maintenance costs involved in the provision of municipal water above and beyond those that are not covered by governmental grants. In this analysis we do not consider costs of new water infrastructure (mainly funded by specific infrastructure grants) when evaluating cost recovery. We examine FBW policies and provision by conducting case studies on three South African municipalities: Polokwane Local Municipality, Limpopo Province; Mbombela Local Municipality, Mpumalanga Province; and Rustenburg Local Municipality, North West Province. We utilize data on population characteristics, budget, and water tariff structure to investigate the FBW policy in each municipality. We are interested in determining the feasibility each municipality has for achieving cost recovery for its water services, given the structure of its water tariffs. Given that the three municipalities do not yet provide FBW to all poor households within their jurisdictions, we make some predictions as to how difficult recovering water services costs might be if the municipality expanded the water infrastructure to the remaining poor households.

³The meaning of “tariffs” in this report simply refers to the fees charged to a water service provider or to the consumer for the total volume of water consumed.

Water Provision System

According to the Water Services Act of 1997, there are three fundamental objectives for managing water services. First, all people should have access to at least a basic, minimum quantity of potable water and benefit from the use of water resources. Second, water resources should be managed in a sustainable manner. This idea is closely related to the principle of “demand management.” The DWAF strives to incorporate demand management into its water services policies by discouraging inefficient and wasteful uses of water through pricing structures and conservation efforts (Department of Water Affairs and Forestry, 2002a, p. 11). Lastly, water should be used in an economically efficient way to promote the overall economic development of the country (Republic of South Africa, 1997). These objectives reflect the belief of South Africans that water is a scarce resource that is necessary for survival (and therefore a human right) as well as an economic commodity. The water provision system is structured to achieve these sometimes conflicting objectives.

South Africa’s water provision system involves a diverse group of actors. First, as an overall policy designer and regulator, the South African Department of Water Affairs and Forestry (DWAF) oversees the activities of all water sector institutions and is responsible for national/international resource planning and allocation. As its name suggests, a Water Service Provider is the entity that provides water (and also sanitation services) to the people of a particular jurisdiction. Water Service Providers deliver service at a variety of levels such as a single rural community, one or more towns, or a large metropolitan area (Storer & Teljeur, 2003).

The DWAF sells raw water to 15 bulk water services providers throughout the country that are referred to as water boards. These boards are responsible for purifying and selling the raw water to water service authorities, which are levels of government assigned by the Water Services and the Municipal Structures Acts. The DWAF performs the function of a water service authority in some areas, although this practice is being phased out as responsibilities are being transferred to the municipalities as they gain administrative capacity.⁴ Water service authorities can choose either to undertake the water service provision function itself or contract it out to another body such as another local authority, a water board, a community based organization, or a private company (Department of Water Affairs and Forestry, 2002a). Of the 169 water service authorities, 27 serve

⁴There are three types of municipalities in South Africa: metropolitan municipalities, local municipalities, and district municipalities. Metropolitan municipalities are separate entities, but district municipalities encompass multiple local municipalities (Bahl & Smoke, 2003). While the role of water service authorities rests with district municipalities, the minister of Provincial and Local Government Affairs may authorize a local municipality to take the role of water service authority (Department of Water Affairs and Forestry, 2002a).

their entire populations, while 139 authorities provide water service to a fraction of their populations, and four authorities are unable to implement water provision (Department of Water Affairs and Forestry, 2009b).

Water Boards are able to set prices for bulk water by themselves under ministerial approval; thus prices for bulk water vary considerably across South Africa.⁵ These bulk water prices should reflect to some degree the average cost of obtaining water in a certain geographical region of the country.⁶ Given that bulk tariffs account for a large proportion of the overall retail price of water, this has implications for municipalities' retail water pricing schemes (Republic of South Africa National Treasury, 2008b).

According to the Republic of South Africa Constitution, local governments bear the responsibility for designing, financing, and maintaining the water system. Successful implementation of water provision is dependent upon managerial capacity and financial strength at the local level. Given a very uneven distribution of administrative capabilities and resources, water provision varies considerably among municipalities.

Pricing schemes vary considerably throughout South Africa. The central government has stated that the water service authorities (most often the local municipalities) should attempt to set tariffs (user fees) based on costs and take account of social equity, financial viability and environmental sustainability (Republic of South Africa National Treasury, 2008b).

South Africans access water from several different sources. In areas where a piped water system (also known as a reticulated system) has been constructed, meters monitor the flow of water per liter to each household. Some households have water piped inside their dwelling while others have only one connection piped into their yard. In many rural areas there are only communal standpipes which serve many households from a village. Other methods of accessing water exist (e.g., hand pumps on boreholes, surface water collection), but municipalities do not regulate them. Surface water collection is discouraged due to sanitary concerns.

⁵While the average price for bulk tariff charged by water boards was R4.06 kiloliters in 2006/07, the highest bulk tariff was R7.13 per kiloliter in KwaZulu-Natal Water Board, and the lowest bulk tariff was R2.09 per kiloliter in Magalies Water Board (Republic of South Africa National Treasury, 2008b).

⁶We were unable to obtain current information on the setting of bulk water prices for the three municipalities we studied.

Free Basic Water Policy

Although access to water is one of the basic needs guaranteed in the Constitution, few municipalities had established a FBW program by the turn of the millennium. This changed in 2000 when a cholera outbreak in KwaZulu-Natal was partly attributed to the lack of access to clean water by impoverished rural citizens. Many municipalities were using controversial methods of cost recovery such as prepaid meters on communal standpipes or cutting off piped water flow to households who failed to pay the required tariffs. This crisis put a national spotlight on the subject of basic water provision. Ronnie Kasrils, then the minister of Water Affairs and Forestry, said in a statement to the media: “The problem is that when we try to implement cost-recovery, many of the poor cannot pay. The consequence, when they are excluded from the tap, has been seen with the cholera outbreak in KwaZulu-Natal” (Moloi, 2004, p. 42).

The result of this renewed focus on basic water provision was the FBW initiative which began in 2001. The policy called for at least 6 kiloliters to be provided per household per month. However, not all municipalities agreed on whether this basic amount should be for all citizens or only the impoverished who could not afford normal tariff rates. In 2002, the DWAF clarified its position on the FBW policy:

The primary intended recipients of free basic water are poor households. Although there is a broader policy commitment to the extension of free basic services to all households the primary target of the policy is poor households for whom free basic services represent a significant poverty alleviation measure (Department of Water Affairs and Forestry, 2002b, p. 7).

With the central government pushing for the implementation of FBW policies, local municipalities needed to design measures to provide basic water to poor households while attempting to cover the costs of the subsidy. To help achieve both goals, the DWAF outlined its FBW plan in several publications, such as the *Free Basic Water Implementation Strategy* (2002b). In the following paragraphs we describe the three methods that were part of their strategy, and we suggest two alternative approaches—geographic targeting and uniform price with rebate.

Rising block tariff

A rising block tariff is the standard water pricing model in South Africa. In 2001, the DWAF endorsed the use of rising block tariffs by amending the 1997 Water Service Act to include a set of norms and standards for setting water tariffs (Department of Water Affairs and Forestry, 2001). A rising block tariff system divides water consumption into levels or blocks and applies progressively higher

prices for each block (in liters) of water. It is a widely used water pricing method around the world because of its ability to cross-subsidize from wealthier consumers that tend to use relatively higher amounts of water to poorer consumers who tend to use relatively lower amounts. For this method to produce adequate revenue to finance the subsidized first block, the tariff charged to the higher blocks must exceed the average cost of water and enough people must consume at the higher rates to pay for the subsidies. The assumption is that wealthier households consume more water per capita than do low income households and their demand for water is relatively inelastic. The DWAF suggests that cross-subsidization generally requires that at least 40 percent of households purchase at least 20 kiloliters of water per month (Palmer Development Group, 2001a). This guideline, however, fails to explain the importance of setting the price and levels of each block in such a way as to cover the average cost of water provision, given estimated consumption patterns.⁷

It is important to keep in mind the proportion of household income that is spent on water services. If prices for higher blocks are greatly increased, households may reduce their consumption of water, thereby undercutting cross-subsidization efforts. They could also maintain their current consumption but fail to make payments. Or they could maintain their consumption and reduce household expenditures on other necessities, thereby negatively affecting their standard of living.

Rising block tariff with a zero first block (Universal Policy)

For households with metered connections, there are two standard ways to design a FBW policy using rising a block tariff system. The first is sometimes referred to as universal FBW and involves simply charging nothing for the first block (typically 0 to 6 kiloliters) and charging progressively higher tariff rates for successive blocks. The benefits of this design are the relatively low administrative costs and the avoidance of any social stigma that poor people might receive through a targeted approach. The drawbacks would be that the municipality is subsidizing 6 kiloliters of water to the non-poor, even though they are capable of paying the tariff. This foregone revenue must then be raised in some other way, perhaps through higher tariff rates for water consumption above 6 kiloliters.

⁷Average cost includes all operation and maintenance costs involved in the provision of municipal water. Costs of new infrastructure are not included because they are usually funded through governmental grants.

Rising block tariff with targeted credits (Indigent Policy)

The other method of administering a FBW policy in a jurisdiction with metered water is called targeted credits (sometimes referred to as an indigent policy). Under this system, each household that is registered as indigent receives a credit on their water bill for the free amount of basic water. Indigents are generally identified based on monthly household income. Because South Africa has no official national poverty line, municipalities may establish their own criteria for what constitutes indigent status.⁸ The DWAF considers a monthly income of 800 rand (R800) or below to be a poor household, and many municipalities have adopted this measure (Department of Water Affairs and Forestry, 2009a).⁹ Households below the indigent income level are required to register with the local municipality in order to obtain indigent status. Applicants need to have a total household monthly income below a certain level and have a South African identity document. These requirements exclude many indigent households who do not have proof of poverty but are still in need of basic services. In addition, some municipalities impose further conditions that make registration difficult for poor people. Applicants often cannot obtain indigent status unless they pay off past arrears, agree to install flow restrictors, and pay a connection fee and deposit. Further, to retain indigent status, households need to reapply every one to two years, a process that is often onerous (Tissington, Detterman, Langford, Dugard, and Conteh, 2008).

Once an indigent registry is established, applying the subsidy is fairly simple from an accounting standpoint (Palmer Development Group, 2001a). The identified households receive a credit on their water account which covers the cost of the free water allocated to each indigent household (Department of Water Affairs and Forestry, 2002b). Non-indigent households that can afford to consume higher levels of water will pay increasing tariff rates, the revenue from which will help offset the costs associated with providing credits to the indigents. The benefit of this policy is more efficient revenue collection based on an ability-to-pay measure. A potential drawback is the administrative cost involved in creating and maintaining the indigent registry. And as was the case with the zero first block rising tariff, targeted credits require the administrative capacity to meter water use and bill households accordingly.

Although indigent policies vary considerably across South Africa, several criticisms commonly arise. One is that in most municipalities the indigent registry severely under represents the true number of poor households. This could be a

⁸Work is underway to develop a method for determining a standard nationwide poverty line (Republic of South Africa National Treasury, 2007).

⁹The exchange rate is approximately R9 (South African rand) per \$1 (U.S. dollar), so R800 is equivalent to approximately \$90 per month.

result of the limited administrative capacities of the municipal officials and also the difficult self-registration process for indigents. Poor households may also avoid registering because of the associated stigma. This may be why there is growing international consensus that targeting approaches to alleviating poverty fall short of the desired goals. This is especially true with targeting mechanisms that require self-registration (Tissington et al., 2008).

Service-Level Targeting

A third FBW policy approach is service-level targeting. This mechanism is most commonly found in rural areas where water services are provided through communal standpipes or boreholes (Balfour, Wilson, de Jager, Still, and Louw, 2005).

This targeting mechanism restricts the amount of water to the basic service levels. One advantage is that service-level targeting does not require a great deal of administrative capacity. It can be implemented without the costs of an indigent policy and typically does not require a metering and billing system for restricted flow service levels. According to the Department of Water Affairs and Forestry:

Those municipalities with very low capacity and a high proportion of poor consumers may have to rely in part or fully on a service level targeting approach where limited service levels are used, which, by their nature only supply a basic amount of water. However, even in these areas it may be necessary to recover some costs from those consumers who can afford basic services (Department of Water Affairs and Forestry, 2002b).

While in most cases water from communal standpipes has been provided at no cost to the consumers, some municipalities have attempted to further control water consumption by charging fees at the tap. Coupons are distributed to residents in a rural area who need to redeem them while an official monitors the standpipe. He then distributes the amount of water stated on the coupon. It is not difficult to envision implementation problems with this approach, including the potential for corrupt behavior.

Geographic Targeting

Geographic targeting is a more recent policy mechanism that focuses on indigent populations in specific geographic locations. In situations where poor households live in a definable area, geographic targeting may be easier and less expensive because the municipality needs only to identify the correct borders of the region. A recent report on water service in South Africa produced by scholars at the Centre for Applied Legal Studies in Johannesburg, the Centre on Housing Rights and Evictions in Geneva, and the University of Oslo mentions that indigent people in South Africa could benefit from this method because of the past

apartheid geography which segregated poor black populations from rich white populations (Tissington et al., 2008).

One drawback of geographical targeting is that it fails to differentiate between ranges of poor households that may be able to pay a small amount and the very poor, who cannot afford to pay anything at all (Khalfan et al., 2007).

Uniform Price with Rebate

Another tariff design option is a uniform price with rebate. Professors John J. Boland and Dale Whittington first suggested it as a practical alternative to a rising block tariff structure (2000). Instead of setting rising prices for each amount of water consumed, this method sets a standard price equal to the marginal cost of providing the water. Each consumer is charged this fixed price per liter of water regardless of total consumption. Then, presuming that marginal costs exceed average cost of water provision, enough revenue is generated to provide a rebate for some basic level of water. With enough additional revenue, a rebate can be provided to all households. If the rebate amount is set at 6 kiloliters of water per household, it would have the same effect as the rising tariff with a zero first block system.

The benefit of this system is its simplicity. A single water price would likely reduce the billing and administrative operations needed to manage a tariff system effectively, resulting in lower cost and greater transparency. This should increase efficiency compared with a rising block tariff system, especially if the blocks are not priced appropriately. Moreover, because only one price needs to be calculated, there is less opportunity for politically influenced price setting, as can happen with a rising block tariff system. One primary drawback, however, is its inability to curb water demand by charging higher prices for households that may choose to over-consume. This lack of demand management may help explain why tariff systems in South Africa generally use a rising block tariff system. Nevertheless, the rebate portion of this policy is used in the tariff structure of Rustenburg, which will be discussed in an upcoming section.

Financing

The FBW policy is financed by internal and external municipal resources; the relative importance of each source depends mainly on the demographic and socioeconomic characteristics of the local governments. Internal municipal revenues come primarily from local property taxes and water tariff fees, while external sources mainly come in the form of conditional and unconditional grants from the national government. Urban areas contribute a substantial amount of their own revenues toward supplying water and sanitation services through the use of tariffs. Charging for water in this method is possible only at water sources

that are metered, which tend to be in more developed areas (Republic of South Africa National Treasury, 2008b). In the case of many largely rural (and poor) municipalities, the internal revenue sources usually are not enough to cover the cost of implementing a FBW policy for all poor households. Many areas within these poorer municipalities do not have metered water sources; without metering it is impossible to utilize rising block tariff structures. The areas that do have metered connections may attempt to cross-subsidize through rising block tariff schemes, but with a lower proportion of high-income residents (normally larger water consumers) this could be difficult. To assist municipalities with financing FBW and other basic services, the central government provides some grant funding.

In South Africa, central government funding comes mainly through the Equitable Share unconditional grant, the Water Service Operating Subsidy and the Municipal Infrastructure Grant. The Equitable Share is the largest single transfer program, accounting for an average of 56.7 percent of all national government transfers to municipal governments between fiscal years 2003/04 and 2009/10 (Republic of South Africa National Treasury, 2008b). It is intended to fund a range of municipal activities, although the main purpose of this grant is “to ensure that low income households in all municipal jurisdictions receive access to basic municipal services (Department of Provincial and Local Government, 1999). The Equitable Share formula considers five components: basic services, development, institutional support component, revenue-raising capacity correction, and a correction and stabilization component. The basic services component is close to 92 percent of the local government Equitable Share; its purpose is

to assist municipalities in providing basic services to poor households and with meeting municipal health service needs for all. For each of the subsidised basic services there are two levels of support: a full subsidy for poor households that are connected to municipal services [poor households earning less than R800 per month in 2001 prices], and a partial subsidy for households that are not yet connected to the municipal networks, currently set at a third of the cost of the subsidy to serviced households (Republic of South Africa National Treasury, 2009).

As the Equitable Share for local government is largely an unconditional transfer, it is the responsibility of individual municipalities to ensure that these funds are used appropriately for the poorest people, defined according to their own poverty indicators (Mosdell and Leatt, 2005).

The local governments assuming administration of water schemes previously run by the DWAF also receive from the national government the water service

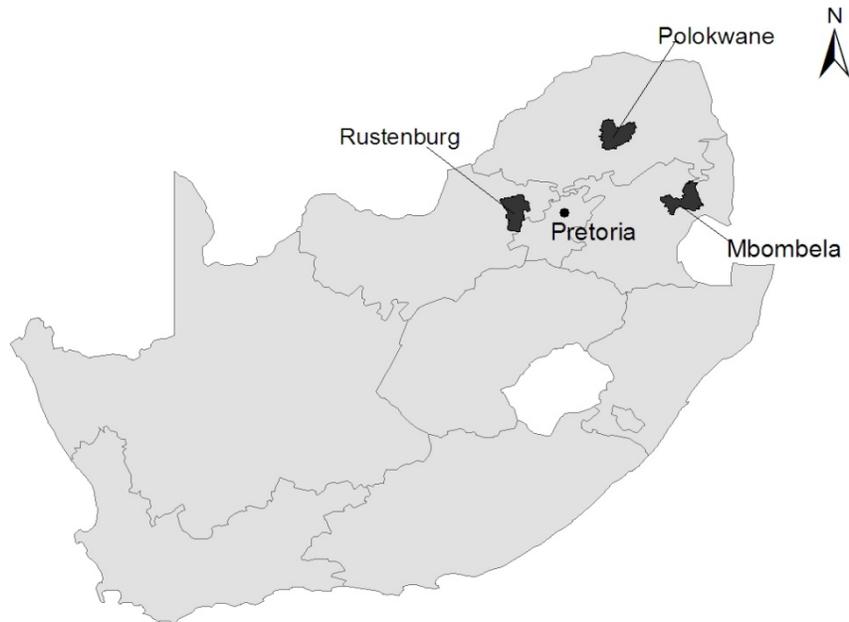
operating subsidy. This grant funds the operating costs of water services that have been transferred to municipalities. The subsidy is projected to rise over time, as more transfers take place. Ultimately, when all the transfers have occurred, these resources will be consolidated into the Equitable Share. Finally, capital spending on water and sanitation assets is financed through the basic services component of the Municipal Infrastructure Grant, which is mainly focused on bulk water investment and sanitization (Republic of South Africa National Treasury, 2009).

The extent to which such subsidies are sufficient to cover the costs of providing free basic water is of ongoing concern to municipalities. Where subsidies are seen as insufficient, observers worry that non-poor areas may be incapable of producing sufficient local revenue to finance basic services (Reschovsky, 2003). For the water policy to be sustainable, it is critical that the revenue collected from tariffs be sufficient to cover the costs of FBW not covered by the Equitable Share grant. This requires accurate metering, accounting and receipting systems, as well as effective billing and fee collection mechanisms (Mosdell and Leatt, 2005).

FBW Provision in Three Municipalities

The following sections describe the water provision systems of three local municipalities within South Africa: Polokwane, Rustenburg, and Mbombela. These municipalities were chosen by the Financial and Fiscal Commission based on their similar size and proportion of rural residents. We first conduct a review of the each municipality’s demographic and fiscal characteristics and then describe the current state of FBW services. Each section concludes with observations and conclusions.

Figure 3. Municipal Locations of Polokwane, Rustenburg, and Mbombela



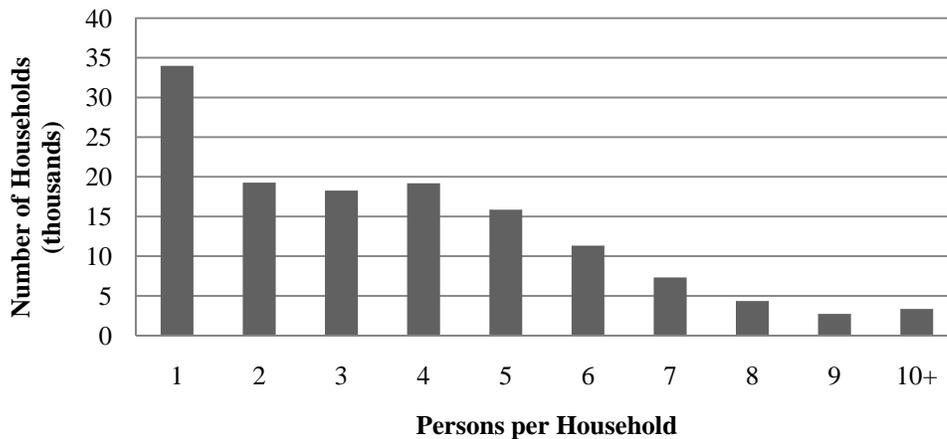
(Map generated by Park, Minhye from www.maplibrary.org)

Polokwane Local Municipality, Limpopo Province

Polokwane Local Municipality (hereafter referred to simply as Polokwane) is situated in the center of Limpopo Province and located within the Capricorn District Municipality. The City of Polokwane is the municipal seat as well as the capital of Limpopo Province. It is the largest city in northern South Africa and is the major economic hub of the province. In February 2002, after a public participation process, the city’s name was changed from Pietersburg to Polokwane—a Northern Sotho word meaning “place of safety” (Polokwane Local Municipality, 2009).

Polokwane comprises 167 communities. In 2007, the municipality’s population was estimated at 561,770 people or 130,360 households, roughly 4.3 persons per household (Statistics South Africa, 2007).¹⁰ As the following chart shows, a small but significant (more than 5,000) number of households report having more than eight persons, the household size assumed by the national government when defining the minimum level of water to be received by all South African households.

Figure 4. Household Size
Polokwane Local Municipality

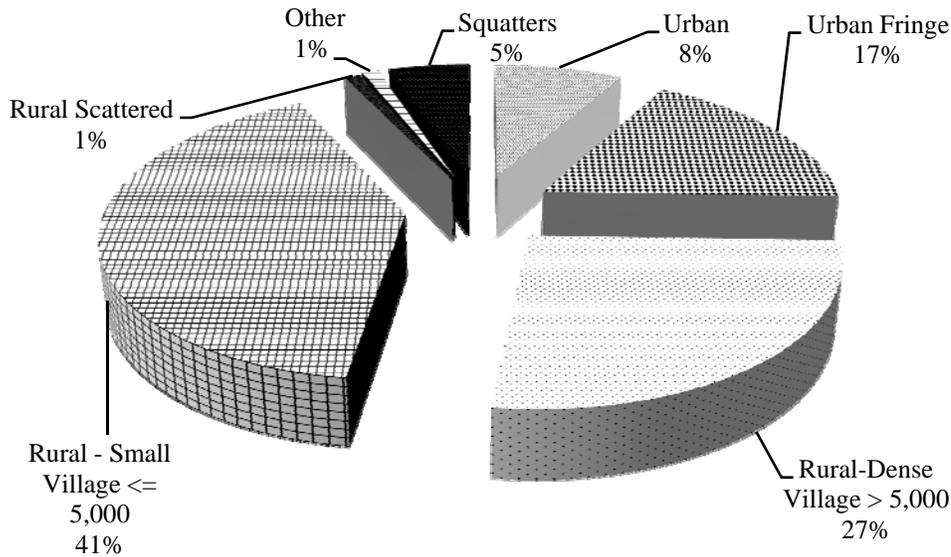


(Statistics South Africa, 2001a)

Figure 5 illustrates the distribution of the population by community type. At least 67 percent of the population lives in rural communities, most of which are villages of 5,000 or fewer residents (Polokwane Local Municipality, 2006). The dispersed nature of the municipal population likely poses a challenge to cost recovery efforts as greater dispersion requires more infrastructure and higher maintenance and service costs.

¹⁰The DWAF website reports the municipality’s April 2008 population at 553,203 people and 142,807 households. These numbers are based on the 2001 national census and expanded with Statistics South Africa growth models (Department of Water Affairs and Forestry, 2009b).

Figure 5. Population Distribution by Community Type
Polokwane Local Municipality

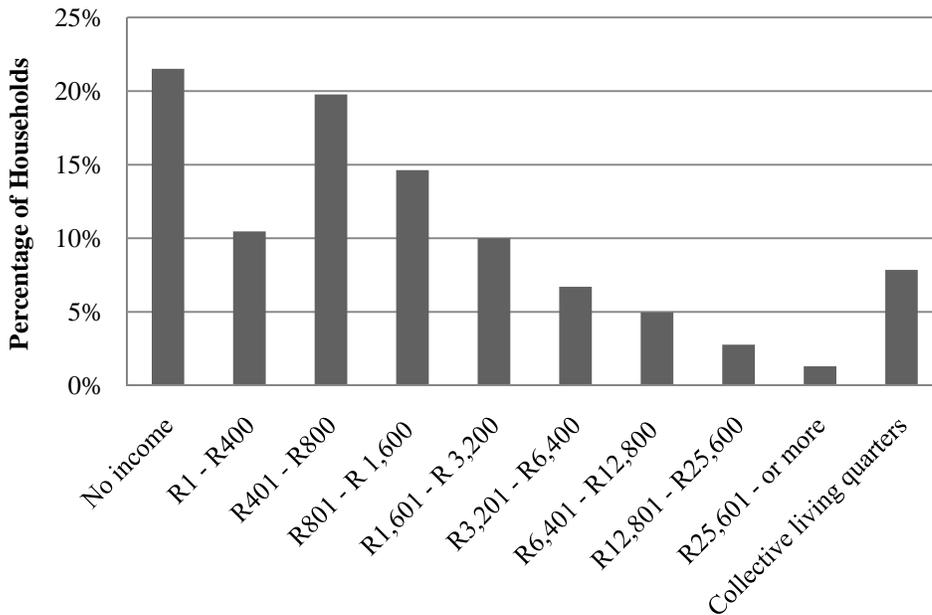


(Polokwane Local Municipality, 2006)

Less formal settlement areas, situated on the outskirts of Polokwane City, are experiencing an influx of people from rural areas. These growth areas need upgraded services and infrastructure as officials struggle to cope with new residents who want access to a better standard of living (Polokwane Local Municipality, 2008c).

Extremely impoverished rural settlements, located farther away from the city, have limited or no access to services and infrastructure. As stated by the municipality, “the communities in these areas, although they contribute to the economy of the city, are deprived of its benefits” (Polokwane Local Municipality, 2008c). In Figure 6 we see that approximately one half of households in 2001 reported income equal to or less than R800 per month, the standard by which the government often defines a poor household.

Figure 6. Monthly Household Income
Polokwane Local Municipality



(Statistics South Africa, 2001a)

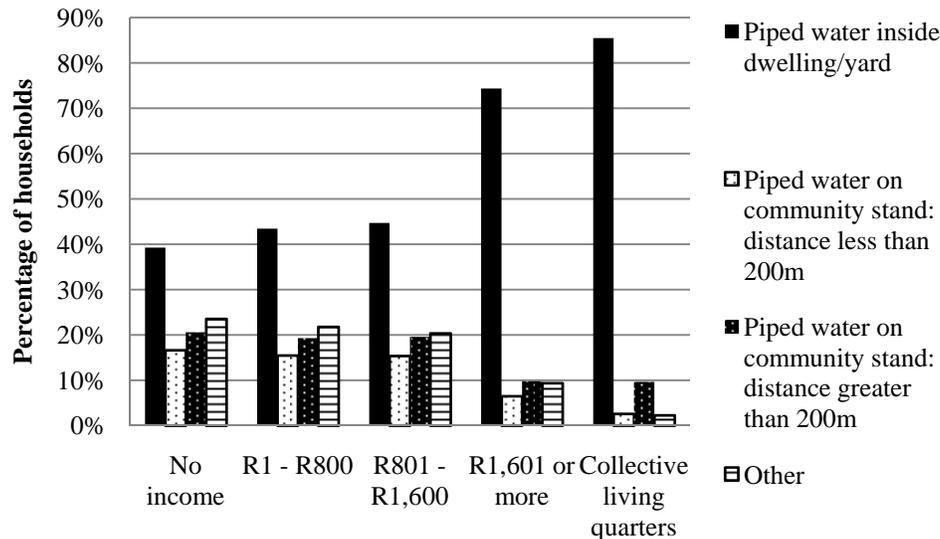
Polokwane: Water Service Provision

The municipality obtains its bulk water from the Lepelle Northern Water - Water Board, as well as from its own sources such as boreholes and the Dap Naude, Seshego, and Malepo dams. The local municipal government is the area’s water service authority and also its principal water service provider; however, some rural community water service is administered by the DWAF and community-based organizations (CBOs). “The CBOs are not formally contracted and are mainly responsible for ad hoc collection of household contributions to pay for bulk water and other expenses” (Palmer Development Group, 2001b).

Urban areas are supplied mostly through metered, in-house connections. Households in rural areas and informal settlements receive their water mainly through community standpipes and boreholes, while some obtain water from pools, streams, springs, water vendors, and other sources (Statistics South Africa, 2007). Some consumers have made illegal house connections to the piped water infrastructure (Polokwane Local Municipality, 2008c). Figure 7 illustrates the differences in primary water source for households as income varies. Households reporting monthly incomes between zero and R1,600 exhibit very similar distributions of water source type. Relatively high income households and

households categorized as collective living quarters are much more likely to have access to piped water in their homes.¹¹

Figure 7. Water Source by Income Category
Polokwane Local Municipality



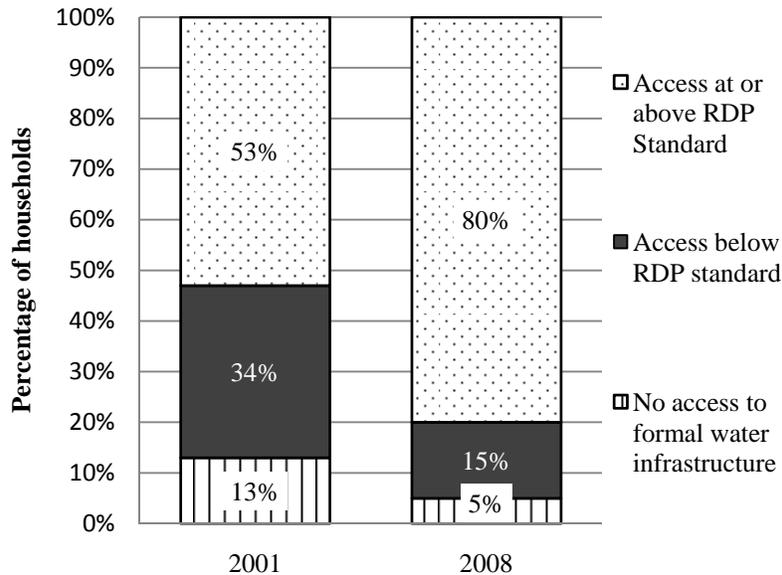
(Statistics South Africa, 2001a)

While no community in the municipality is currently without water, 71 villages' water access is below RDP standard, and some households do not have access to formal water infrastructure, such as piped water or boreholes (Polokwane Local Municipality, 2008c).

As stated in the municipality's 2007/08 annual report, 26 percent of households had formal water access below RDP standards. Of those households, 689 were classified as urban and 33,562 were classified as rural. An additional 28 percent of households were at RDP standard, all of them classified as rural. This left 46 percent of households that were found to be above the standard, 50,249 of which were urban and 9,327 were rural households (Polokwane Local Municipality, 2008a). Figure 8 shows the municipality's progress in lowering the proportion of households with substandard or no access to formal water infrastructure:

¹¹Collective living quarters, as defined in the 2001 Census, are "living quarters where certain facilities are shared by groups of individuals or households. They can be divided into: (a) hotels, motels, guest houses, etc.; (b) workers' hostels and student residences; and (c) institutions" such as hospitals, convents, prisons, and defense force barracks (Statistics South Africa, 2001b).

Figure 8. Access to Water Infrastructure
Polokwane Local Municipality



(Department of Water Affairs and Forestry, 2009b)

Polokwane: Free Basic Water Coverage

While municipalities across the country are expanding their service to previously excluded populations, their progress toward providing that service free to at least all poor residents varies. Polokwane has a goal of providing FBW to all of its residents by 2010 (Polokwane Local Municipality, 2008c). Figures obtained from the DWAF suggest that the municipality is moving closer to its goal each year. As of April 2008, an estimated 80 percent of all households and 83 percent of poor households received FBW, defined in Polokwane as 6,000 liters of water per month free of charge (Department of Water Affairs and Forestry, 2009a). Of the 114,169 households in the municipality receiving FBW, 53,481 were classified as poor, while the remaining 60,688 households were classified as non-poor by DWAF standards (Department of Water Affairs and Forestry, 2009a).

Polokwane: Tariff Policy

As mentioned earlier, the municipality employs a variety of water delivery mechanisms. For in-house water metering, a rising block tariff with a zero first block is used to price and bill water services. Table 1 presents the block tariff schedules for 2007/08 and 2008/09. A key difference between these two years is that in 2008/09 the first 10 kiloliters of water is provided free to all users.

Table 1. Residential Tariff Rates
Polokwane Local Municipality

2007/08		2008/09	
Water Quantity (in kiloliters)	Price per kiloliter (in Rand)	Water Quantity (in kiloliters)	Price per kiloliter (in Rand)
First 5	3.20	First 10	0.00
Following 10	4.80	Following 5	5.10
Following 15	5.20	Following 15	5.55
Following 20	6.90	Following 20	8.45
Following 50	8.30	Following 50	8.85
Consumption in excess of 100	10.00	Consumption in excess of 100	10.65

(Polokwane Local Municipality, 2008e)

In addition to block tariffs, there are many other provisions within the water rate policy. Where water is supplied to residents through a communal source that is metered, the above-mentioned block prices apply, while the water quantity corresponding to each price level is determined by multiplying the water volume specified in the block tariff structure by the number of persons served by the particular communal source (Polokwane Local Municipality, 2008d). For example, if 10 people are served by a particular communal source and they consume a total of 120 kiloliters of water in a month, they will be charged nothing for the first 100 kiloliters and R5.10 for each of the remaining 20 kiloliters, for a total monthly bill of R102. To better understand this system's effectiveness, we would like to know how billing is carried out and what proportion of billed revenue is collected under this communal metered system.

The great majority of households in Polokwane City pay their municipal service fees; however, some other settlements pay a very small proportion of the charges. Table 2 presents combined municipal services (primarily electricity and water) payment rates from September 2007 through August 2008, organized by major settlement areas. More information is needed to understand why the Mankweng and Sebayeng payment rates are so low in comparison to other areas and why the Farm Lands payment rate is more than 100 percent.

Table 2. Polokwane Municipal Services Payment Rates

Region/Land Type	Charges	Payments Received	Payment Rate
	(Rand)	(Rand)	(%)
Mankweng	13,476,105	449,744	3.34
Sebayeng	354,531	20,177	5.69
Seshego	4,374,612	3,808,247	87.05
Polokwane City	51,484,613	46,586,329	90.49
Farm Lands & Agric. Holdings	-815,229	1,254,788	153.92
Total	68,874,633	52,119,287	75.67

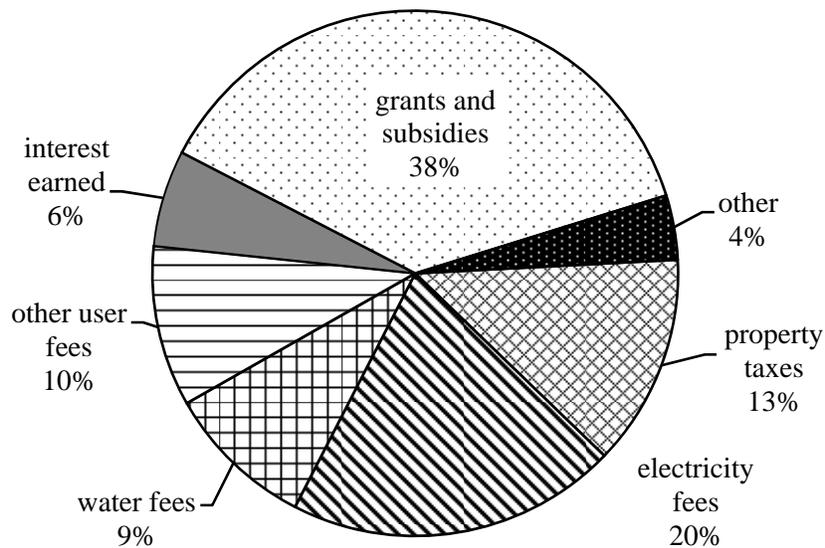
(Polokwane Local Municipality, 2008b)

Polokwane: Municipal Finances

The municipality receives its revenue from four main sources: government grants and subsidies, municipal service user fees, property tax, and interest earned from investments and debts to the city. Figure 9 details the primary revenue sources for the 2006/07 budget. We can observe that user fees (from electricity, water, and other sources) and government grants are the largest source of municipal revenues.

Figure 9. Sources of Revenue

Polokwane Local Municipality (2006/07 Budget)



(Polokwane Local Municipality, 2008c)

The Equitable Share is the largest single grant received by the municipality—R181,350,000 for the 2008/09 fiscal year, accounting for 13 percent of the municipal operating budget or 9 percent of its total budget (Polokwane Local Municipality, 2008b; Republic of South Africa Minister of Finance, 2008).

While water fees account for a significant portion of the municipal budget, in the 2006/07 fiscal year they failed to cover the cost of water service. It is unclear how the 2008/09 block tariff system, which includes a zero first block rate, will affect the gap between cost and revenue.

Polokwane: Conclusions

Polokwane Local Municipality has made great progress since 1994 in terms of providing access to water to its residents; however, an estimated 5 percent of households still do not have access to formal water infrastructure. A first priority must be to ensure that all municipal residents have access to a safe, reliable, and nearby (less than 200 meters) water source. As evident in Polokwane's Capital Budget, it is currently working on a number of water infrastructure programs, many funded by the Municipal Infrastructure Grant, to address this top priority (Polokwane Local Municipality, 2008c).

As of 2008/09, the municipality uses a rising block tariff with a zero first block system. We assume that this adjustment to block tariffs was made with the hope that higher block rates would create more revenue to cross-subsidize FBW. Considering that approximately 50 percent of households in Polokwane reported incomes of R800 or less in 2001, it seems doubtful that this new tariff structure would be able to generate significantly more cross-subsidization than before. Because of this income distribution, Polokwane is more reliant on grants like the Equitable Share to finance its FBW program than other municipalities with a lower proportion of poor households.

Table 3 shows that Polokwane currently reports a budget deficit in terms of water service provision. Although it seems Polokwane is able to finance this deficit within its overall municipal budget, it is important to discover why the water services deficit exists.

Table 3. Revenues and Expenditures
Polokwane Local Municipality

2006/07 Operating & Capital Budget (Actual)			
<i>(in Rand)</i>			
	Revenue	Expenditure	Surplus
Water Services	105,687,659	141,567,076	-35,879,417
Municipal Budget	1,363,377,000	973,972,000	389,405,000

(Polokwane Local Municipality, 2008a;
Republic of South Africa National Treasury, 2008a)

To better understand how Polokwane’s FBW policy affects the municipal water services cost recovery, we would need to obtain current water service expenditures, water consumption data at each block level, and household payment rates. With this information we could easily see how water services revenue compares to expenditures. However, this would only tell us how well expenditures were being recovered for current services rendered. In order to evaluate how the increased revenue gained from the higher tariff blocks may subsidize FBW, we need to estimate the costs of providing water services in substandard areas. Is the extra revenue enough to cover the operating and maintenance costs in these areas? At least some revenue may be generated through metered communal standpipes, a strategy currently employed in Polokwane and described in its Water Services Development Plan. How widespread and effective is this strategy in Polokwane? We do not have sufficient data to make a determination.

It is likely that cost recovery is adversely affected by the disperse nature of Polokwane’s population. Because most of Polokwane’s population is in villages of 5,000 or fewer residents, more infrastructure and maintenance will be needed, which will likely require more expenditure.

In summary, the following key questions remain to better determine how Polokwane’s FBW policy affects cost recovery efforts and how the municipality’s water services revenue-raising capacity affects FBW expansion to Polokwane’s poorest households:

- By how much has Polokwane’s new block tariff structure been able to increase water services revenue and how has this system affected the average water consumption of its poorest households?
- How effective are metered communal standpipes at helping to cover costs associated with providing FBW to scattered settlements?
- What share of water service operating and maintenance costs are covered by water service fees and the Equitable Share?
- What sources of revenue cover any remaining costs?

Rustenburg Local Municipality, North West Province

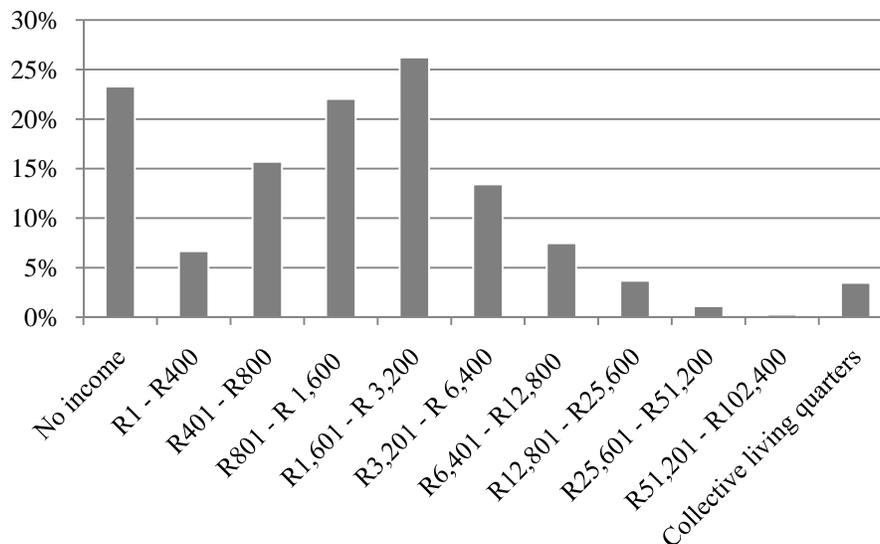
Rustenburg Local Municipality (hereafter referred to as Rustenburg) is approximately 110 km northwest of Johannesburg in the North West Province, and it is located within the Bojanala Platinum District Municipality. Its population in 2008 was estimated to be 435,386 and is divided into 36 wards (Statistics South Africa, 2001a). Table 4 shows basic demographic data for Rustenburg as of the 2001 census. The majority of its citizens reside in urban areas, but it does have groups of peoples living in more rural areas such as the Royal Bafokeng Kingdom, a native tribal group. Figure 10 shows the percentage of households in various income categories. The graph shows that a relatively large percentage of the population falls among middle-income categories.

Table 4. Demographics
Rustenburg Local Municipality

Location Type	Population	Households	Average Household Size
Municipal Settlements	237,302	71,488	3.3
Bafokeng Tribal Settlements	95,993	30,380	3.2
Mining Hostels	20,728	2,882	7.2
Rural Areas	41,738	11,885	3.5
Total	395,761	116,635	3.4

(Statistics South Africa, 2001a)

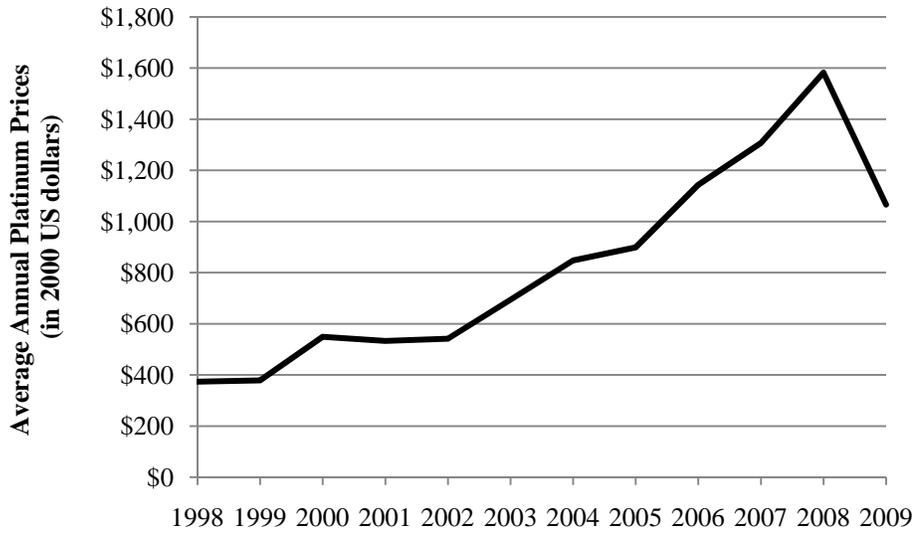
Figure 10. Percentage of Households in Income Category
Rustenburg Local Municipality



(Statistics South Africa, 2001a)

Rustenburg is unique in that its economy is very dependent upon the mining industry. It has three of the world's largest platinum mines, and this industry accounts for 50 percent of all formal employment (Rustenburg Local Municipality, 2008). Over the past decade, the price of platinum has skyrocketed. Figure 11 shows the pace of this exponential growth.

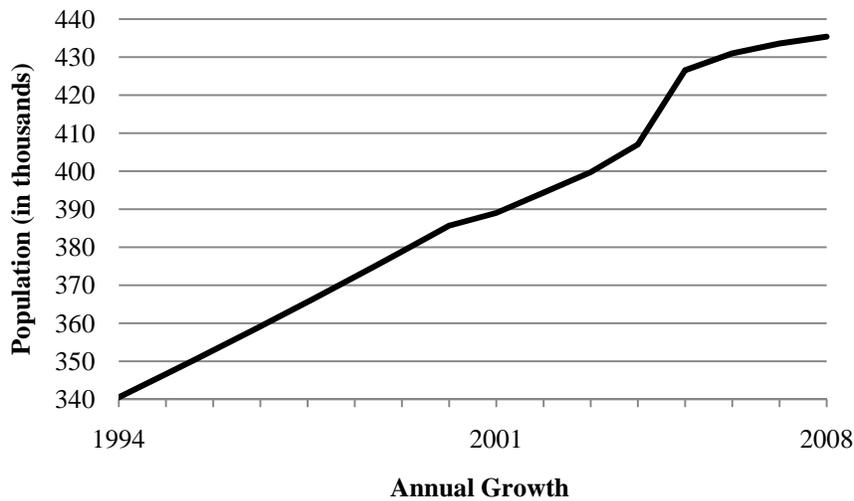
Figure 11. Growth of Platinum Prices
Rustenburg Local Municipality



(Johnson Matthey, 2009)

Because of this trend, both the population and the economy of Rustenburg have grown significantly. The town of Rustenburg has been one of South Africa's fastest growing economic areas with an annual compound economic growth rate of 8 percent between 2002 and 2008 (Rustenburg Local Municipality, 2008). The mining sector increased its employment, which attracted many new residents to Rustenburg. Figure 12 illustrates the rapid increase in population since 1994.

Figure 12. Population Growth
Rustenburg Local Municipality



(Department of Water Affairs and Forestry, 2009b)

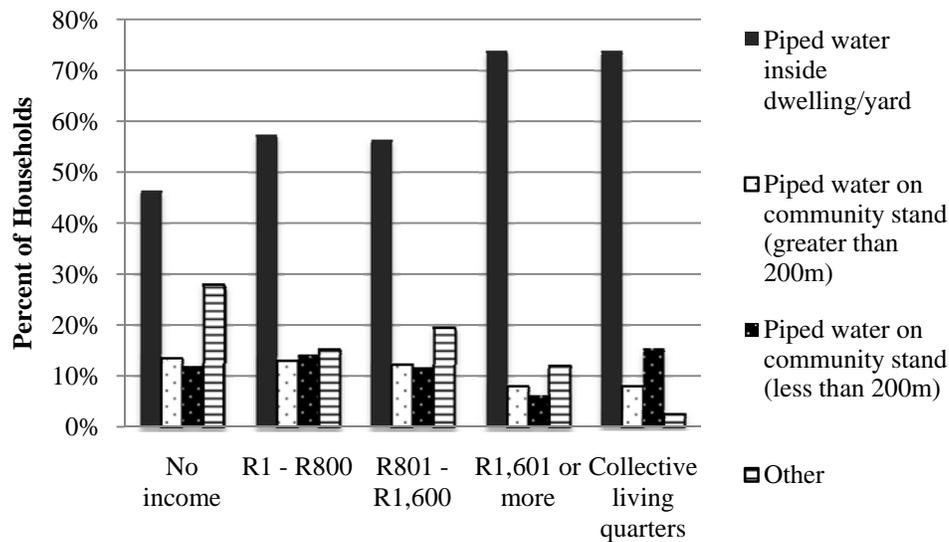
This population boom has increased the tax base, but it has also increased the level of public services that the Rustenburg government needs to provide, especially water services.

Rustenburg: Water Service Provision

As the Water Services Authority, Rustenburg purchases bulk water from two main private suppliers, the Rand Water Corporation and Magalies Water. Although the region surrounding Rustenburg does not have a shortage of water sources, the supply that is available is greatly affected by the water usage of the mines. In 2003, it became evident that with the increase in both commercial and residential water use, new water infrastructure was needed. Rustenburg's solution involved the creation of a municipal services entity called the Rustenburg Water Services Trust. Establishing this organization allowed Rustenburg to jointly finance the construction of two sewage treatment plants and an upgrading of a water purification plant with Magalies Water. Working closely with the mining companies, the Rustenburg Water Services Trust also began to sell effluent from the sewage treatment plants for use in their operations. Additionally, it started to supply potable water directly to residents. The revenue from these income streams is considered to be sufficient to "service capital redemption, pay for maintenance and operation by Magalies Water, and to generate a profit with a net present value of approximately R150 million over the 15-year life span of the loan period" (Marx, Van der Walt, & Fouche, 2008).

Turning back to the issue of water provision in Rustenburg, it is useful to understand how they access potable water. Figure 13 shows the type of water access by income group. It is clear from the graphs that the vast majority of Rustenburg’s residents have access to some form of piped water inside their homes or in their yards.

Figure 13. Water Source by Income Category
Rustenburg Local Municipality



(Statistics South Africa, 2001c)

Because a reticulated water system is already in place for the majority of Rustenburg residents, the process for monitoring consumption per household (and subsequently charging tariffs) is relatively straightforward. Each household with piped water access has a meter that measures output. The household is then charged a fee for the amount of liters of water consumed in a month (specific tariff schemes for Rustenburg will be discussed in the next section).

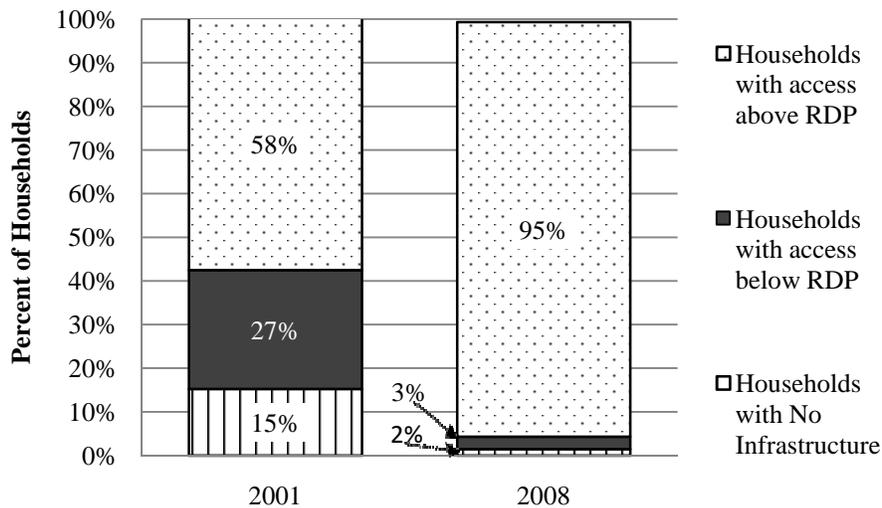
For rural areas where households do not have access to a reticulated piping system, however, different cost recovery strategies will need to be implemented for delivery methods such as communal standpipes. In Rustenburg, the Royal Bafokeng Kingdom has taken responsibility for providing water services to many of its tribes’ members who live outside urban areas. The Royal Bafokeng Association is the administrative arm of the Royal Bafokeng Kingdom, and serves as a basic services provider to many of the rural citizens. The Rustenburg Local Municipality 2007 State of the Environment report states that “various smaller and localised schemes are available in the townships for water supply” (Rusten-

burg Local Municipality, 2007b). It further refers to the Royal Bafokeng Association Regional plan which says “the water purchased by the Royal Bafokeng Association will be sufficient enough to supply the settlements till 2010” (2007b). More information is needed to adequately address the many issues that likely exist in water provision to rural areas, but these sources indicate that it may not be as significant a problem as it is in other parts of South Africa.

Rustenburg: Free Basic Water Coverage

Rustenburg has a robust FBW policy. One large departure from the national FBW standards is the amount that is considered “free” for each household. Instead of 6 kiloliters per household per month, Rustenburg has doubled the standard to 12 kiloliters per household per month. This falls in line with the World Health Organization guidelines stating 50 liters of water per day is sufficient for most basic health and sanitation. Figure 14 shows the current percentage of households that are above and below the RDP guidelines for water access and those that have no access to water infrastructure.

Figure 14. Access to Water Infrastructure
Rustenburg Local Municipality



(Department of Water Affairs and Forestry, 2009b)

Rustenburg: Tariff Policy

For residential areas with metered connections, an increasing block tariff method is used to price water. This system also provides a subsidized rebate for residents classified as indigents. The indigent rebate policy has two income tiers which determine the amount of subsidy. The first tier of extremely poor receives a rebate for 100 percent while the next tier receives a rebate for 50 percent of the cost of up to 12 kiloliters of water per household per month. For all non-indigent con-

sumers of metered water, a basic connection fee of R31 per month is charged in addition to the increasing block tariffs schedule. Table 5 shows the current block pricing system used in Rustenburg, while Table 6 gives a description of the two tier categories.

Table 5. Rustenburg Residential Tariff Rates

Rustenburg Local Municipality

Amount of water used (kiloliters)	Current Tariff (in Rand)
Residential 0 – 12	5.68
Residential 13 – 25	6.57
Residential 26 – 40	7.15
Residential 41 - 60	7.78
Residential 61+	8.41

(Rustenburg Local Municipality, 2007b)

Table 6. Indigent FBW Subsidy Program

Rustenburg Local Municipality

	Income Level (in Rand)	FBW Rebate Amount*
Tier 1	less than or equal to 870 per month	100% of FBW charges
Tier 2	between 870 and 1,740 per month	50% of FBW charges
*FBW amount is considered up to 12 kiloliters per household per month		

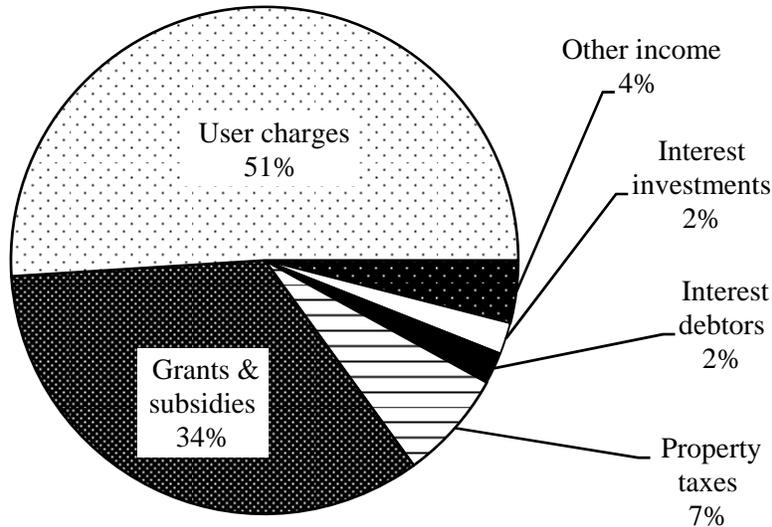
(Rustenburg Local Municipality, 2007a)

This policy requires low-income individuals to register as indigents with the municipality in order to be eligible for the rebate. More information is needed on how exactly the municipality confirms eligibility. According to a recent municipal report, there are concerns that this policy is not helping the majority of eligible individuals because they live in rural areas without metered connections. The report stated that “the indigent register has only approximately 2,200 households currently registered as indigents in areas where the municipality renders services. In addition to these registered indigents, approximately 7,000 households were registered in terms of the indigent policy in areas where we do not currently render municipal services” (Rustenburg Local Municipality, 2007a, p. 31).

Rustenburg: Municipal Finances

Rustenburg has enjoyed a municipal budget surplus for the last several years. Its largest source of revenue is from user charges while grants and other subsidies also constitute a large share. Figure 15 shows the breakdown of municipal income by category type.

Figure 15. Sources of Revenue
Rustenburg Local Municipality



(Rustenburg Local Municipality, 2007a)

Table 7 shows the most recent actual and projected budgets for both water services and the municipality as a whole.

Table 7. Revenues and Expenditures
Rustenburg Local Municipality

2006/07 Operating & Capital Budget (Actual)			
<i>(in Rand)</i>			
	Revenue	Expenditure	Surplus
Water Services	127,004,000	91,111,000	35,893,000
Municipal Budget	1,370,113,000	1,244,848,000	125,265,000

(Rustenburg Local Municipality, 2007a;
 Republic of South Africa National Treasury, 2008a)

Rustenburg: Conclusions

Based on several municipal reports, it is clear that the greatest concern about the water provision system is water loss and water theft due to illegal water connections. The Medium Term Revenue and Expenditure Framework for 2007/08 states that “the biggest challenge faced in the supply of water to end consumers, over and above access to water, is the reduction of the calculated water loss of 32 percent. Although it is anticipated that a water loss of 10 percent is within the

accepted norms, the 32 percent loss currently experienced by Rustenburg Local Municipality is reason for serious concern” (Rustenburg Local Municipality, 2007a, p. 43). Some of this loss has been able to be made up by the innovative public-private partnerships between Rustenburg and the water boards as well as with the mining companies.

One other area of concern is the recent decline in platinum prices seen in Figure 11. If this were to drastically affect the level of employment and mining operations, it could have severe impacts for local tax revenue and the level of profit gained from selling effluent charges. More research needs to be done to identify what other areas of concern exist in the water provision system in Rustenburg, specifically how FBW is implemented in poor, rural regions.

Considering that Rustenburg is the wealthiest of the three municipalities in our analysis (based on income levels), it is likely to be the best candidate for cross-subsidization strategies through an increasing block tariff. Furthermore, Rustenburg’s Water Services Trust has helped to reduce costs and generate revenue through infrastructure investment and the sale of effluent from its sewage treatment facilities. These factors have contributed to successful cost recovery. A comparison of the municipality’s revenue from water service fees with the water service operating expenditures (minus outside financial assistance such as grants) would help to highlight the extent of cost recovery capacity.

Rustenburg does note that most indigent households do not benefit from the FBW rebate policy because many of these households are in rural areas currently outside the reach of municipal services (Rustenburg Local Municipality, 2007a). Expanding service to those 5 percent of households who do not have access to water at RDP standards will likely make cost recovery more difficult. A future analysis might estimate these expansion costs and the current pricing system’s potential to cover these costs. Furthermore, we were unable to obtain information on the role that the Royal Bafokeng Association plays in providing water services to rural areas. Evaluating how well this organization uses infrastructure grants to improve water accessibility would be a critical piece to an overall assessment of the FBW program in Rustenburg.

Mbombela Local Municipality, Mpumalanga Province

The Mbombela Local Municipality (hereafter referred to as Mbombela) is located in the northeast of South Africa. Mbombela is part of the Mpumalanga Province and is home to the provincial capital Nelspruit. When translated, Mbombela means “a lot of people together in a small place.” According to the 2007 Community Survey, the population of Mbombela is slightly more than 527,000 (Statistics South Africa, 2007). While cities such as Nelspruit have large urban populations, the majority of the population in Mbombela is rural. According to data gathered

during the 2001 Census, 26 percent of the population is urban and the remaining 74 percent is rural (Statistics South Africa, 2001a).

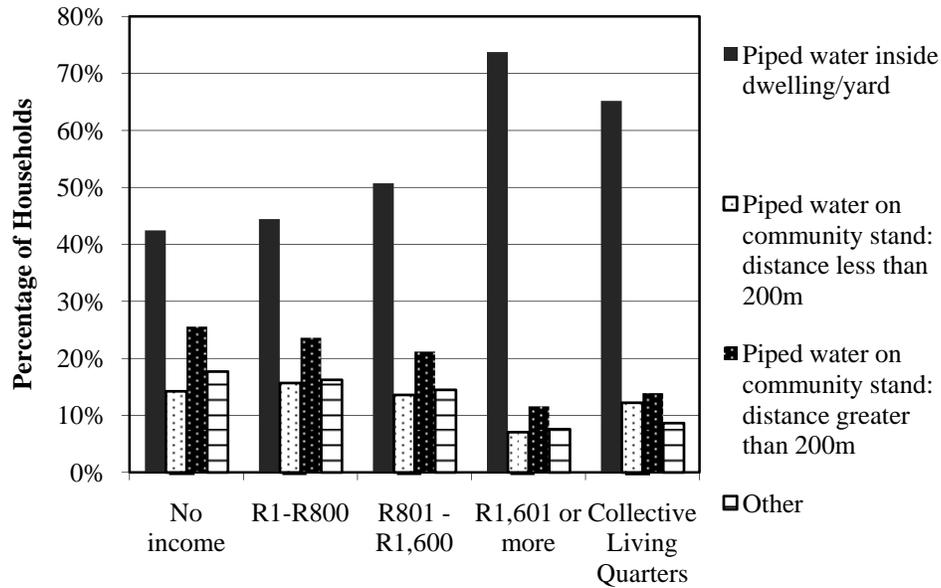
The economy of Mbombela has been stimulated by growth in the construction sector. Much of this growth came from the construction of Mbombela Stadium in Nelspruit for the 2010 FIFA World Cup. More traditional sectors also play a large role in the Mbombela economy. Of the population between the ages of 15 and 65, 50 percent is employed, 16 percent is unemployed, and 34 percent is not economically active (Statistics South Africa, 2007). Nearly 18 percent of the workforce in Mbombela is employed in the agricultural sector. The Mbombela municipality is one of the largest banana and citrus producers and exporters in South Africa. One third of South Africa's orange exports come from the city of Nelspruit in Mbombela (Mbombela Local Municipality, 2008)

Mbombela: Water Service Provision

Water distribution in the Mbombela area has been divided between private and public providers. Originally the Greater Nelspruit Water Company, a private water services company, was given a 30-year concession to provide water to the area. In 2000, the merger of the Nelspruit, White River, and Hazyview localities formed the Mbombela municipality as it is known today. This created some challenges since the Greater Nelspruit Water Company still had a 30-year concession to provide water in the Nelspruit part of Mbombela. An agreement was reached to allow them to continue providing water to the Nelspruit area while the municipal government supplied water to the rest of Mbombela's residents.

Figure 16 shows that most households in Mbombela have water provided through pipe systems. Piped water inside the home is most common in the urban areas of the municipality. For the rural communities, water is generally accessed through pipes in households' yards or through community standpipes. Additionally, poor residents living in the trust areas of the municipality may find water from alternative sources such as rain water tanks, boreholes, or rivers and streams.

Figure 16. Water Source by Income Category
Mbombela Local Municipality

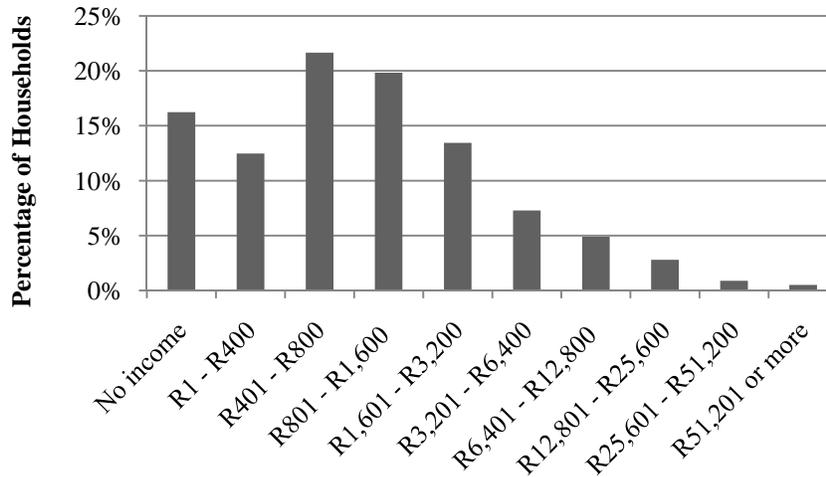


(Statistics South Africa, 2007)

Mbombela: Free Basic Water Coverage

In January 2002, Mbombela became one of the first municipalities to implement a FBW policy that provided 6 kiloliters of free water per household per month (Brown, 2005). Originally, this policy was intended to provide water to households with incomes under R800 per month. As shown in Figure 17, a large proportion of the Mbombela population qualified for FBW under this system. However, because of the administrative costs associated with targeting and registering the poor households, Mbombela concluded that it was more efficient to provide FBW to all households, regardless of income.

Figure 17. Monthly Household Income
Mbombela Local Municipality



(Statistics South Africa, 2001a)

Mbombela: Tariff Policy

After Mbombela implemented their FBW policy, the Greater Nelspruit Water Company justified the need to raise tariff rates in order to cover the costs of the free services. This has been followed by annual rate adjustments for both the private and public water service providers. Tariff charges are easily calculated by reading the meters located on the pipes. Despite the concern over the meters being tampered with, the system generally works well. A larger concern has been how to provide FBW to poor areas that do not have meters. In rural trust areas where there is no cost recovery scheme, there is also no guarantee of water provision (Brown, 2005). This has led to the increase of infrastructure programs in those areas as well as block tariff schemes that favor the poor. Through cross-subsidization, Mbombela has been able to rely on revenue received from high-paying areas such as Nelspruit and rely less on areas like the town of Kabokweni where the cost recovery rate is below 15 percent (Brown, 2005). As shown in the White River Area portion of Table 8, Kabokweni also receives much more favorable pricing schemes compared with other towns within the White River area of Mbombela.

The current water tariff rates in Mbombela divide the municipality into several different regions. First there is the area that falls under the private company of Silulumanzi (formerly the Greater Nelspruit Water Company). The public water service provider in Mbombela then has rate schemes for the remaining two areas of Hazyview and White River. It is worthwhile to point out the difference between the basic monthly charges that are administered in the three areas.

For water services that exceed the 6 kiloliters/month, Silulumanzi charges R26.53, Hazyview charges R79.37, and White River charges R40.86. For the poor township of Kabokweni, there is no basic monthly charge.

Table 8. Residential Tariff Rates in Silulumanzi

Monthly Tariff Blocks (in kiloliters)	Silulumanzi Rates (in Rand)
Basic connection fee (above 6 kiloliters/month)	26.53
0-6	0.00
7-12	0.00
13-20	5.83
21-40	6.11
41-150	6.25
Over 150	6.38

(Mbombela Local Municipality, 2009b)

Table 9. Residential Tariff Rates in Hazyview, White River, and Kabokweni

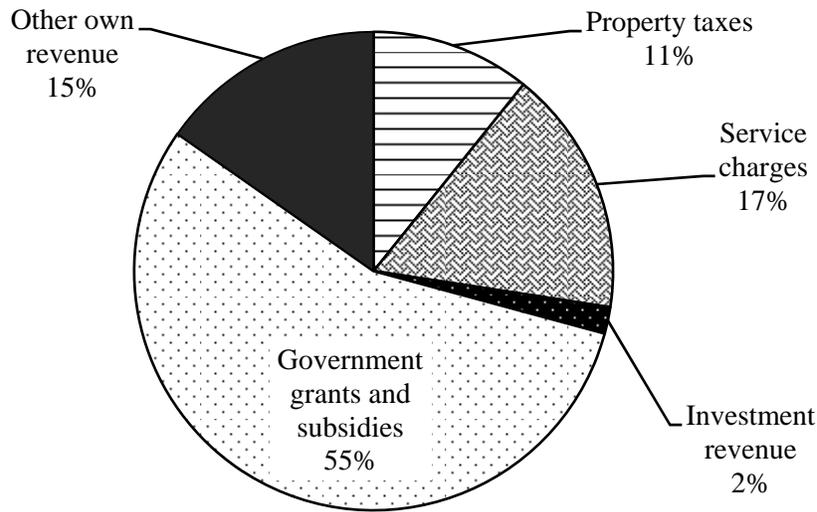
Monthly Tariff Blocks (in kiloliters)	Regional Rates (in Rand)		
	Hazyview Area	White River Area	Kabokweni Township
Basic connection fee (above 6 kiloliters/month)	79.37	40.86	0.00
0-6	0.00	0.00	0.00
7-30	5.80	7.91	4.82
31-100	3.50	6.44	5.00
Over 100	3.48	6.00	6.27

(Mbombela Local Municipality, 2009b)

Mbombela: Municipal Finances

As is the case in many South African municipalities, the Equitable Share grant is an important source of Mbombela's funding. In Mbombela, a portion of the Equitable Share grant is given to the private water service company Silulumanzi. This is because Silulumanzi provides water for approximately 350,000 residents, which is over half of Mbombela's population (Silulumanzi, 2009). Figure 18 provides a summary of Mbombela's revenue sources.

Figure 18. Sources of Revenue
Mbombela Local Municipality (2006/07)



(Republic of South Africa National Treasury, 2008a)

Although government grants such as the Municipal Infrastructure and Equitable Share grants make up 55 percent of Mbombela’s revenue sources, other sources of revenue are also important. Property taxes account for 11 percent of the municipality’s capital and operating budget, and 17 percent comes from various service fees. These revenue sources remain more stable since the property tax base is fairly immobile. While service charges may vary, the most basic services such as water, sanitation, and electricity are provided free of charge at the basic levels. This would suggest that there is at least some demand for higher levels of services.

Mbombela benefits from Municipal Infrastructure Grant funds, which help it to meet the costs of improving and constructing water service infrastructure such as treatment facilities and piping networks. Mbombela’s 2008/09 Integrated Development Plan shows the steady increase in forecasted funds that the municipality plans to use to continue improving its services (Mbombela Local Municipality, 2009a).

Table 10. Grants and Subsidies (per thousand Rand)

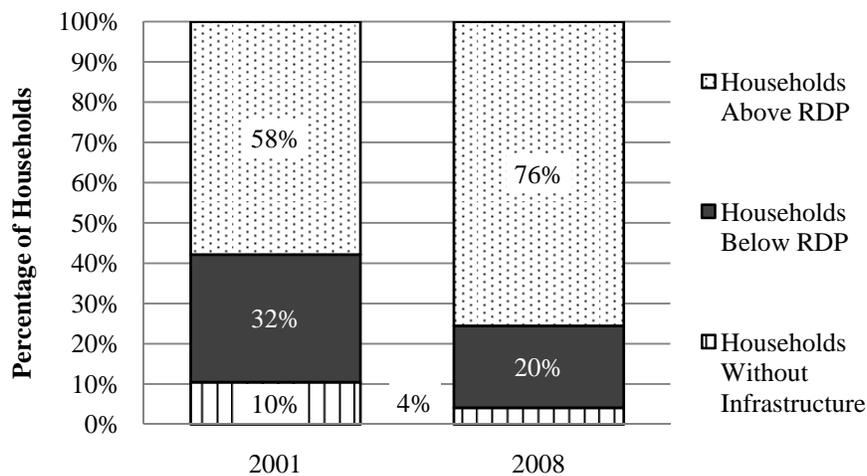
Mbombela Local Municipality

	2007/08	2008/09	2009/10	2010/11
Equitable Share	118,000	145,156	182,235	227,129
Municipal Infrastructure Grant	74,916	94,899	107,825	88,346

(Mbombela Local Municipality, 2009a)

Through the use of grants and subsidies such as the Municipal Infrastructure and the Equitable Share Grants, Mbombela has been able to reduce the backlog of households that were not receiving basic water services. Over the seven-year period between 2001 and 2008, Mbombela was able to provide higher levels of water access based on RDP standards. The number of households without infrastructure decreased by 6 percentage points over this time period while the number of households meeting or exceeding the basic RDP standard increased by 18 percentage points (Department of Water Affairs and Forestry, 2009b).

Figure 19. Access to Water Infrastructure
Mbombela Local Municipality



(Department of Water Affairs and Forestry, 2009b)

Table 11 shows the most recent data available on Mbombela's budget. Because we do not have access to more current and detailed budget data, it is difficult to determine the extent to which the municipality is recovering costs.

Table 11. Revenues and Expenditures
Mbombela Local Municipality

2006/07 Operating & Capital Budget (Estimated)			
<i>(in Rand)</i>			
	Revenue	Expenditure	Surplus
Water Services	74,853,283	74,853,283	0
Municipal Budget	1,190,439,000	1,171,044,000	19,395,000

(Mbombela Local Municipality, 2007;
Republic of South Africa National Treasury, 2008a;
Republic of South Africa National Treasury, 2008c)

Mbombela: Conclusions

Despite our lack of detailed budget data, we do know that many households in Mbombela still lack free and basic water service that meets the RDP standard. In addition to better understanding the municipality’s budget figures and considering the potential cost-recovery consequences of expanding FBW to all households, four characteristics of Mbombela’s water services stand out as areas for further study.

First, Mbombela implemented FBW provision initially through an indigent policy and later through a universal approach; it may now be considering a return to targeting indigent households. Changing policy approaches so quickly likely reflects the difficulty of determining a best way to provide the services and achieve cost recovery. We recommend further analysis of the effectiveness of different FBW strategies (i.e., rising block tariff with zero first block or targeted credits) in terms of cost recovery and provision to the poorest households.

Second, a private company provides water to households in roughly one-third of the municipality. The remaining two-thirds are serviced by municipal government. We recommend investigating the effectiveness of the private company, Silulumanzi, at providing FBW. How well does it do compared with the municipal government, and what might be key differences between the two entities’ operations that lead to any differences in efficiency?

Third, within the areas serviced by the municipality, three different block tariff structures are applied. The basic monthly charge, applied beyond 6 kiloliters per month, varies greatly.

Table 12. Mbombela Basic Monthly Water Service Charge
(for service exceeding 6 kiloliters/month)

Mbombela Region	Basic Monthly Charge (in Rand)
Hazyview Area	79.37
White River Area	40.86
Kabokweni Township	0.00

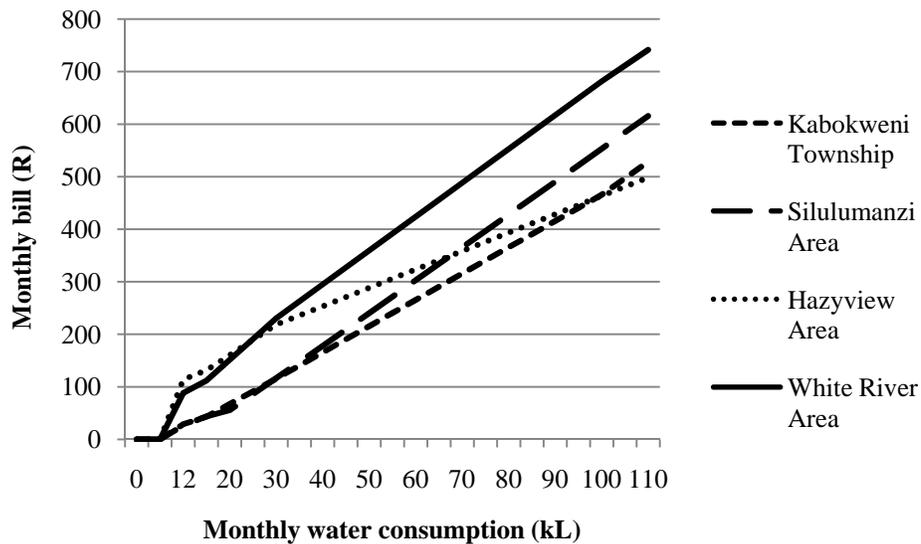
(Mbombela Local Municipality, 2009b)

We assume that Kabokweni’s lower tariff rate is a geographical targeting strategy, and we also assume that Hazyview and White River’s high basic monthly charges and relatively high tariff rates are designed to cross-subsidize FBW, but we do not know why Hazyview and White River areas have different tariff rates. We recommend further exploration of this question. We also note that the municipal government greatly increases household water tariffs in Hazyview and White River once consumption exceeds 6 kiloliters per month. This jump in water expenses,

which may act as a strong disincentive for poor households to consume more than 6 kiloliters per month, can be observed in Figure 20 below. The figure shows how much a metered household is charged per month under each of the municipality's four block tariffs, depending on the amount of water consumed. At 12 kiloliters of monthly water consumption, residents of Kabokweni and the Silulumanzi service area pay R28.92 and R26.53, respectively, while Hazyview and White River Residents pay R114.15 and R88.32, respectively. We recommend exploring the effects of this jump in water prices on household consumption and cost recovery. For an eight-member household, 6 kiloliters barely allow for basic needs to be met. It might be possible to design a more gradual increase in monthly payments that would lower the barrier to water consumption just above 6 kiloliters per month while generating the same revenue as the original tariff structure.

Figure 20. Monthly Residential Household Water Bill

Mbombela Local Municipality



(Mbombela Local Municipality, 2009b)

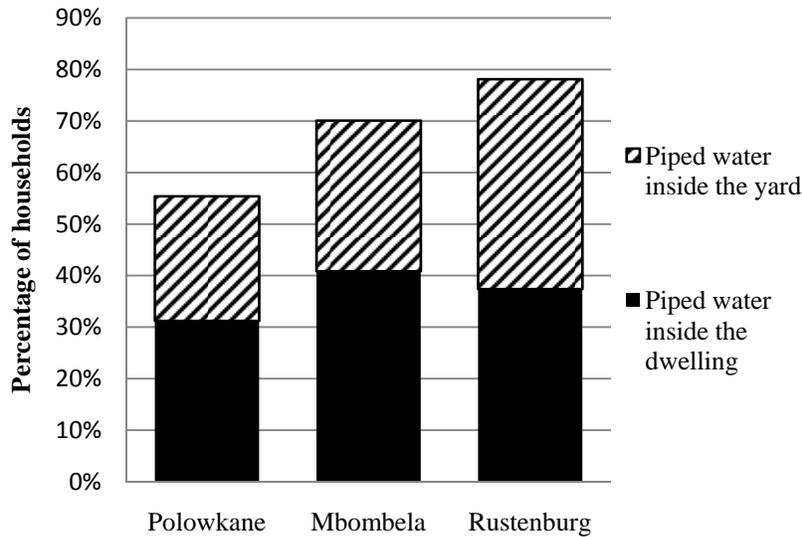
Finally, we note that while Kabokweni township and the area served by Silulumanzi use increasing block tariffs, the areas of Hazyview and White River have decreasing block tariffs. We would like to understand why decreasing block tariffs are used. Based upon our review of tariff policies, we believe decreasing block tariffs fails to generate sizable cross-subsidies from larger water consumers. Furthermore, this system fails to incorporate demand management policies because it could actually encourage some consumers to increase demand.

Conclusion

The main goal of our analysis is to address the effectiveness of each municipality's water tariff water provision system at achieving cost recovery while fulfilling the right of access to basic water. Upon first glance, it seems that the three municipalities are progressively and quite substantially expanding water services to their residents. The backlog in all three municipalities has dropped dramatically since the end of apartheid. However, we do not know how well the data reflect water service provision reality; the Polokwane Water Services Development Plan makes the distinction between technical and operational water service backlog, with operational water service backlog often 10 or more percentage points higher than technical backlog (Polokwane Local Municipality, 2006).

While water service coverage has increased for all three municipalities, we note that the municipalities have different distributions of primary water sources by household. Figure 21 shows that Rustenburg, at 78 percent, has the highest proportion of households with access to piped water in either dwellings or yards. Household water source type has an important effect on metering possibilities and on a municipality's overall cost recovery strategy. Piped water inside the dwelling and piped water inside the yard are the easiest ways to meter and bill for service. For rural areas, the most suitable alternatives are communal taps or low-pressure, trickle-feed yard tanks (typically a 250-liter tank fitted with a flow-control device). These are low-cost alternatives, well suited to providing water to poorer consumers where a strategy of cost recovery is less feasible (Palmer Development Group, 2001a). Because Polokwane and Mbombela have predominantly rural populations and high proportions of poor households, it is likely to be much more difficult for them to implement a cross-subsidy strategy with metered households and block tariffs. The municipalities must rely on national grants to fill, at least in part, their water services financing gaps. Due to limited budget information, we were not able to determine the size of these gaps.

Figure 21. Proportion of Households with Piped Water



(Department of Water Affairs and Forestry, 2009b)

Because we were unable to receive detailed budgets from our municipalities, we conducted only a cursory review of expenditures and revenue. Polokwane reports total budget surpluses, while Rustenburg and Mbombela project balanced budgets. Polokwane reported a R36 million deficit for water services in 2008. For all three municipalities, it is unclear how government grants are accounted for in water service-specific budget figures.

The differences in revenue and expenditure per capita partially reflect the differences in the income levels between each municipality. As shown in Table 13, Rustenburg has a higher level of spending per capita than Polokwane or Mbombela. However, without more explicit budgetary data, we cannot determine how tariff collections and grants contribute to total municipal revenue.

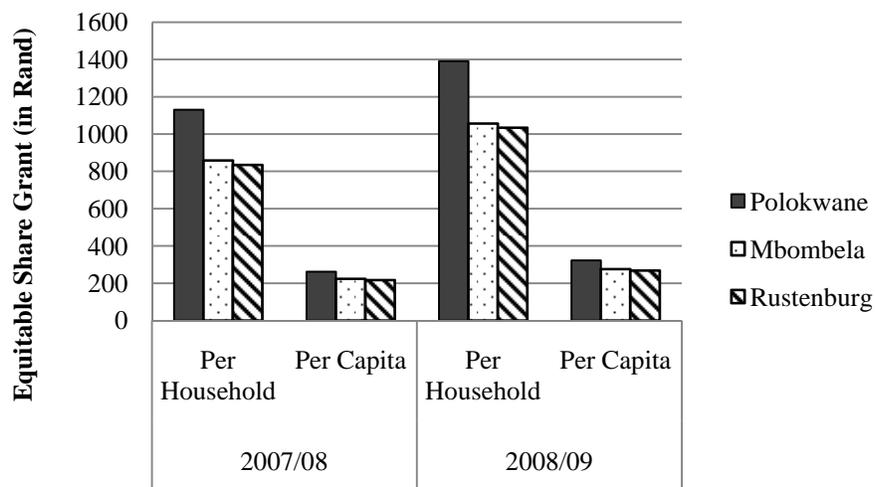
Table 13. Municipal Operating & Capital Budget Comparison (2006/07)

Revenue & Expenditure per Capita (in Rand)			
		Revenue	Expenditure
Polokwane	Water Services	188.13	252.00
	Municipal Budget	2426.93	1733.76
Mbombela	Water Services	142.04	142.04
	Municipal Budget	2258.90	2222.09
Rustenburg	Water Services	291.70	209.26
	Municipal Budget	3146.89	2859.18

(Authors' calculations based on previously cited budget sources)

Figure 22 displays the Equitable Share distribution among the municipalities. This grant is a large source of operating revenue, especially for the lower income municipalities. Given the income distributions among households across the municipalities, there is less variation in grant revenue than expected. Polokwane, which has the lowest level of income among the three municipalities and the largest backlog in water service provision, receives the highest level of Equitable Share per household. This difference noticeably diminishes once per capita comparisons are made because of Polokwane’s relatively larger household sizes. It is worth noting that Mbombela receives a similar grant per capita and per household than Rustenburg in spite of its greater proportion of low income households and households with no access to water services.

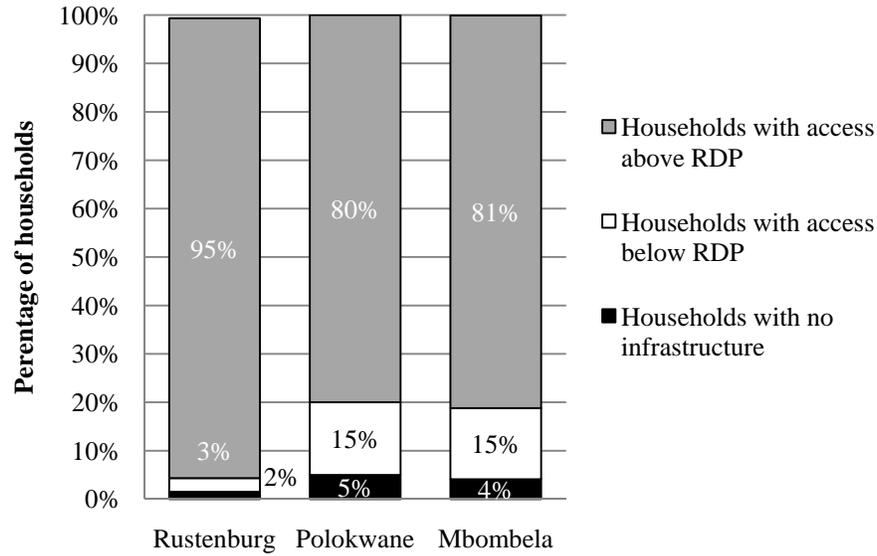
Figure 22. Annual Municipal Equitable Share Amounts



(Republic of South Africa Minister of Finance, 2007;
Republic of South Africa Minister of Finance, 2008)

We also observe that across the three municipalities up to 20 percent of households lack access to water at or above RDP standards and as many as 5 percent of poor households lack access to formal water infrastructure. These households are unable to benefit from their municipalities’ FBW policy. Figure 23 shows that the challenges for each municipality are different. In the case of Rustenburg, only 5 percent of the total households are below RDP standards or without infrastructure, while in Polokwane and Mbombela close to 20 percent of the total households are below RDP standard or without infrastructure.

Figure 23. Access to Water Infrastructure



(Department of Water Affairs and Forestry, 2009b)

Extending and maintaining service to these households may very well require expenses greater than the extra revenue that could be generated through block tariffs and other pricing/cross-subsidization strategies. These greater water service expenses could preclude municipalities from rapidly expanding their service areas. In spite of this, it seems that our three municipalities have steadily expanded services to unserved or underserved households, and so far they have nearly covered their costs through a combination of service fee revenue and government grants.

The constitutional mandate to provide FBW services in South Africa has been heralded in many ways as a human rights success story, and great progress has been made since the end of apartheid. However the fiscal and administrative nuances of the FBW program present many unique challenges.

Recommendations for Future Research

The South African government provides access to an impressive amount and range of data and analysis through its many websites. However, it is not possible to make available all the administrative data that researchers and analysts might desire. While we did gain access to much of the information we sought, we did not obtain some information necessary for a more detailed analysis. Data on water fee revenue (as opposed to total water services revenue, which does not distinguish between government grants and tariff revenue) and water service operating and maintenance expenditures for the same time periods are necessary to determine the extent to which municipalities were achieving cost recovery. Information on household water consumption levels, preferably by household income categories, is needed to estimate the effects of different tariff structures on household water consumption. Household consumption data could also help project costs associated with providing FBW to poor households currently not being served. Most if not all of this information is probably already gathered and maintained at the municipal level. It just was not available to the public via electronic sources. In Appendix A, we list four categories of data with corresponding details that would greatly enhance the ability of future researchers to assess local municipalities' water provision systems. In Appendix B, we pose specific questions that we would have liked to answer more completely in this report. For each question we include the data we think is necessary to answer the question fully and note whether (and where) we think these data can be accessed.

From a policy viewpoint, it might be worth considering legislation requiring municipalities to submit these types of data regularly to the DWAF. We suspect most municipalities already track most of this administrative data, so it would not necessarily be overly burdensome. Ideally, the DWAF could then consolidate this data over time and make it available to other researchers. Access to these types of data could enable more complete analyses of water service provision in South Africa.

Works Cited

- African National Congress. (1994 September). RDP White Paper. Retrieved April 9, 2009, from <http://www.anc.org.za/ancdocs/policy/rdpwhite.html#1.3>
- Bahl, R., and Smoke, P. (2003). Overview of fiscal decentralization in South Africa. In R. Bahl, and P. Smoke, *Restructuring Local Government Finance in Developing Countries: Lessons from South Africa* (pp. 1-22). Northampton, MA: Cheltenham.
- Balfour, A., Wilson, I., de Jager, J., Still, D.A., Louw, S. (2005). Development of Models to Facilitate the Provision of Free Basic Water in Rural Areas. Report No 1379/01/05 to the Water Commission. Retrieved April 10, 2009, from <http://www.wrc.org.za/downloads/report%20lists/web%20rpts/devco/1379-1-05%20Developing%20Communities.pdf>
- Boland, J. J., and Whittington, D. (2000). The Political Economy of Water Tariff Design in Developing Countries: Increasing Block Tariffs versus Uniform Price with Rebate. In A. Dinar (ed.), *The Political Economy of Water Pricing Reforms* (pp. 215-235). New York: Oxford University Press.
- Brown, J. (2005). Water Service Subsidies and the Poor: A Case Study of Greater Nelspruit Utility Company, Mbombela Municipality, South Africa. Working Paper No. 112 in the Working Paper Series of the Centre for Regulation and Development, Institute for Development Policy and Management, University of Manchester, UK. Retrieved from <http://purl.umn.edu/30629>
- Department of Provincial and Local Government. (1999). Annual Report on the Equitable Share for Local Government for the 1998-99 Financial Year. Retrieved April 6, 2009, from <http://www.thedplg.gov.za/subwebsites/publications/equitableshareannualreport.htm>
- Department of Water Affairs and Forestry. (1994). Water Supply and Sanitation Policy White Paper. Retrieved April 1, 2009, from Department of Water Affairs and Forestry. Republic of South Africa: <http://www.dwaf.gov.za/Documents/Policies/WSSP.pdf>
- Department of Water Affairs and Forestry. (2001). Norms and Standards in Respect of Tariffs for Water Service in Terms of Section 10 (1) of the Water Service ACT (Act No. 108 OF 1997). Retrieved April 24, 2009, from http://www.dwaf.gov.za/dir_ws/webdocs/share/ViewwebDoc.asp?Docid=50
- Department of Water Affairs and Forestry. (2002a). Draft White Paper on Water Services. Retrieved March 1, 2009, from Free Basic Water: <http://www.dwaf.gov.za/docs/Other/WaterServices/draft%20water%20services%20white%20paper%206.1.pdf>
- Department of Water Affairs and Forestry. (2002b). Free Basic Water Implementation Strategy. Retrieved March 21, 2009, from <http://fbs.dplg.gov.za/fbs/site/docs/DocumentLibrary/FBW/FBWImplementStrategyAug2002.pdf?PHPSESSID=dd245e1e43caadb037d2946bfb74cd74>

- Department of Water Affairs and Forestry. (2009a). Free Basic Water. Retrieved March 6, 2009, from http://www.dwaf.gov.za/dir_ws/fbw/
- Department of Water Affairs and Forestry. (2009b). Water Services National Information System. Retrieved March 6, 2009, from http://www.dwaf.gov.za/dir_ws/wsnis/default.asp?nStn=wsnisindex
- Howard, G., and Bartram, J. (2003). Domestic Water Quantity, Service Level and Health. Retrieved February 13, 2009, from World Health Organization: http://www.who.int/water_sanitation_health/diseases/en/WSH0302.pdf
- Johnson Matthey, Plc. (2009). Platinum Today. Retrieved March 11, 2009, from Price Database: http://www.platinum.matthey.com/prices/price_charts.html
- Khalfan, A., Roaf, V., Grimes, H., Langford, M., Fairstein, C., Russell, A., Kiefer, T.. (2007). Manual on the Right to Water and Sanitation. Published by the American Association for the Advancement of Science, the Centre on Housing Rights and Evictions, the Swiss Agency for Development and Coordination, and the United Nations Human Settlements Programme. Retrieved April 15, 2009, from http://www.cohre.org/store/attachments/RWP%20-%20Manual_final_full_final.pdf
- Marx, C., Van der Walt, M., and Fouche, L. (2008). *The Rustenberg Water Story: Innovative Water Balance Re-engineering*. Pretoria: Bigen Africa Services Ltd, The Innovation Hub.
- Mbombela Local Municipality. (2007). Operational Budget 2006/2007. Retrieved March 10, 2009, from <http://www.mbombela.gov.za/CapitalBudget.asp>
- Mbombela Local Municipality. (2008). 2008 LED Strategy. Retrieved March 10, 2009, from <http://www.mbombela.gov.za/InvestinMbombela.asp>
- Mbombela Local Municipality. (2009a). Approved 2008-09 IDP - Mbombela Local Municipality. Retrieved March 10, 2009, from <http://www.mbombela.gov.za/Report%20and%20IDP/IDP/Approved%202008-09%20IDP-%20Mbombela%20Local%20Municipality.pdf>
- Mbombela Local Municipality. (2009b). Water Tariffs 2008-2009 with 10 Percent Silulumanzi. Retrieved March 10, 2009, from <http://www.mbombela.gov.za/Tariffs.asp>
- Moloi, D. (2004). The Cholera Outbreak: A 2000-2002 Case Study of the Source of the Outbreak in the Madlebe Tribal Authority Areas, Uthungulu Region, KwaZulu-Natal. Retrieved April 10, 2009, from <http://www.citizen.org/documents/cholera.pdf>
- Mosdell, T., and Leatt, A. (2005, December). On Tap: A Review of the Free Basic Water Policy. Retrieved February 10, 2009, from Children's Institute, University of Capetown: <http://www.ci.org.za/depts/ci/pubs/pdf/poverty/facts/007.pdf>

- Palmer Development Group. (2001a). Free Basic Water. Guideline for Local Authorities. Version 2.3. Retrieved April 16, 2009, from Department of Water Affairs and Forestry: http://www.dwaf.gov.za/dir_ws/fbw/Default.asp?Pageid=3&PageHeading=SYSTEM%20DOCUMENTS&ShowType=18&ProjID=14
- Palmer Development Group. (2001b). Free Basic Water Implementation Strategy Case Study: Polokwane Municipality. Retrieved March 1, 2009, from Department of Water Affairs and Forestry: http://www.dwaf.gov.za/dir_ws/webdocs/share/ViewwebDoc.asp?Docid=41
- Park, M. (2009). Map generated from data located Map Library website. Retrieved April 24, 2009, from <http://www.maplibrary.org/stacks/Africa/South%20Africa/index.php?language=english>
- Polokwane Local Municipality. (2006). Water Services Development Plan. Retrieved April 16, 2009, from Department of Water Affairs and Forestry: http://www.dwaf.gov.za/dir_ws/WSDP/default.asp?nStn=availdocs&Prov=LP&ICode=NP354&docType=1&curYear=8
- Polokwane Local Municipality. (2008a). 2007/2008 Annual Report. Retrieved March 3, 2009, from Polokwane Local Municipality: http://www.polokwane.org.za/userfiles/1/file/Information%20Centre/Annual%20Reports/Annual_Report_Version0708_Final.pdf
- Polokwane Local Municipality. (2008b). 2008/2009 First Quarter Report. Polokwane, Limpopo Province.
- Polokwane Local Municipality. (2008c). Integrated Development Plan 2008-2011. Retrieved March 3, 2009, from Polokwane Local Municipality: http://www.polokwane.org.za/userfiles/1/file/City%20Governance/IDP%20and%20Policy/IDP_Final0.pdf
- Polokwane Local Municipality. (2008d). Local Authority Notice: Revocation and Determination of Tariffs for the 2008/2009 Financial Year. Polokwane, Limpopo Province.
- Polokwane Local Municipality. (2008e). Water Tariffs. *Scanned document received from municipality with no author* .
- Polokwane Local Municipality. (2009, January). Polokwane Local Municipality website. Retrieved March 3, 2009, from <http://www.polokwane.org.za/>
- Republic of South Africa. (1996). Section 27: Health Care, Food Water and Social Security . Retrieved March 5, 2009, from Constitution of South Africa: <http://www.info.gov.za/documents/constitution/1996/96cons2.htm#27>
- Republic of South Africa. (1997). Water Services Act, No. 108. Retrieved January 30, 2009, from <http://www.info.gov.za/view/DownloadFileAction?id=70766>
- Republic of South Africa. (2003, September). Strategic Framework for Water Services: Water is Life, Sanitation is Dignity. Retrieved April 11, 2009, from <http://www.info.gov.za/view/DownloadFileAction?id=70217>

- Republic of South Africa Minister of Finance. (2007, February 16). Division of Revenue Bill. Retrieved April 23, 2009, from <http://www.treasury.gov.za/legislation/bills/2007/revbill3-07.pdf>
- Republic of South Africa Minister of Finance. (2008, February 8). Division of Revenue Bill. Retrieved March 8, 2009, from <http://www.treasury.gov.za/legislation/bills/2008/Bill%20of%202008%20-%20Div%20of%20Revenue%20Bill.pdf>
- Republic of South Africa National Treasury. (2007). A National Poverty Line for South Africa. Retrieved April 20, 2009, from <http://www.treasury.gov.za/publications/other/povertyline/Treasury%20StatsSA%20poverty%20line%20discussion%20paper.pdf>
- Republic of South Africa National Treasury. (2008a). Intergovernmental Fiscal Reviews (IGFR). Retrieved April 23, 2009, from Publications: <http://www.treasury.gov.za/publications/igfr/2008/lg/default.aspx>
- Republic of South Africa National Treasury. (2008b). Intergovernmental Fiscal Reviews (IGFR). Local Government Budgets and Expenditure Review : 2003/04 - 2009/10. Retrieved March 30, 2009, from <http://www.treasury.gov.za/publications/igfr/2008/lg/Chapter%207%20-%20Water%20and%20sanitation.pdf>
- Republic of South Africa National Treasury. (2008c). Local Government Tables. Retrieved April 22, 2009, from http://www.treasury.gov.za/legislation/mfma/media_releases/section_71_1st/Annexure%20A%2010%20Nov%202006.pdf
- Republic of South Africa National Treasury. (2009). Explanatory memorandum to the division of revenue. Retrieved March 31, 2009, from <http://www.treasury.gov.za/documents/national%20budget/2009/review/Annexure%20W1.pdf>
- Reschovsky, A. (2003). Intergovernmental Transfers: the Equitable Share. In R. Bahl, and P. Smoke (eds.), *Restructuring Local Government Finance in Developing Countries: Lessons from South Africa* (pp. 173-235). Northampton, MA: Edward Elgar Publishing.
- Rustenburg Local Municipality. (2007a). Medium Term Revenue and Expenditure Framework. Retrieved March 15, 2009, from <http://www.rustenburg.gov.za/uploads/04%202007-2008%20BUDGET%20REPORT.pdf>
- Rustenburg Local Municipality. (2007b). Socioeconomics. Retrieved March 10, 2009, from Rustenburg State of the Environment: <http://www.rustenburg.gov.za/uploads/Environment%20Website/Socioeconomics.htm>
- Rustenburg Local Municipality. (2008, January 28). Annual Report for the Financial Year 2007/08. Retrieved March 10, 2009, from <http://www.rustenburg.gov.za/uploads/RLM%20Annual%20Report%200708%20Version%205.pdf>

- Silulumanzi. (2009). Coverage Area. Retrieved March 10, 2009, from <http://www.silulumanzi.com/>
- Statistics South Africa. (1996). Table: Population Census 1996 by province, gender, age group and population group. Retrieved April 14, 2009, from <http://www.statssa.gov.za/census01/Census96/HTML/default.htm>
- Statistics South Africa. (2001a). Census 2001 by Municipalities, Household Size and Population Group of Household. Retrieved March 6, 2009, from Statistics South Africa: <http://www.statssa.gov.za/timeseriesdata/pxweb2006/Database/South%20Africa/Population%20Census/Census%202001%20-%20Demarcation%20boundaries%20as%20at%2010%20October%202001/Municipality%20level%20-%20Households/Municipality%20level%20-%20Households.asp>
- Statistics South Africa. (2001b). *Concepts and Definitions*. Retrieved April 2, 2009, from Census 2001: <http://www.statssa.gov.za/census01/html/concepts%20&%20definitions.pdf>
- Statistics South Africa. (2001c). *Digital Census Atlas*. Retrieved March 8, 2009, from Census 2001: <http://www.statssa.gov.za/census2001/digiAtlas/index.html>
- Statistics South Africa. (2007). *Community Survey 2007*. Retrieved March 6, 2009, from Statistics South Africa: http://www.statssa.gov.za/community_new/content.asp?link=interactivedata.asp
- Storer, D., and Teljeur, E. (2003). *Administered Prices*. Retrieved March 20, 2009, from <http://www.treasury.gov.za/publications/other/epir/Summary%20of%20sector%20reports.pdf>
- Tissington, K., Detterman, M., Langford, M., Dugard, J., & Conteh, S. (2008, October). *Water Services Fault Lines: An Assessment of South Africa's Water and Sanitation Provisions across 15 Municipalities*. Published by the Centre for Applied Legal Studies in Johannesburg, the Centre on Housing Rights and Evictions in Geneva, & the Norwegian Centre for Human Rights at the University of Oslo. Retrieved April 15, 2009, from http://www.cohre.org/store/attachments/RWP%20-%20Water_Services_Fault_Lines_Nov08.pdf

Appendix A: Data Needed for FBW Provision Analysis

Category of Data	Details Needed
Revenue	Water fees billed and collected
	Total grant funding and amounts used for water services, detailed by grant type
	Other water service funding sources and amounts (e.g., property tax revenue, electricity fees, etc.)
	Current water tariff structure
	Indigent policy description (if applicable)
Costs/Expenditures	Operating and maintenance total expenditures and also detailed by service type (e.g., in house, in yard, communal standpipe)
	Capital expenditure
	Targeting expenditure (if applicable)
Household	Location/settlement name
	Number of household members
	Monthly income
	Monthly water consumption
	Type of service (e.g., in house, in yard, communal standpipe)
	Monthly water bill
	Monthly amount paid
Other	Price elasticity of demand for water (at least for “poor” and “non-poor” households, if not more detailed)

Appendix B: Questions for Further Research

Question	Data Needed	Source
<p>1. To what extent has a municipality’s block tariff structure been able to recover operating and maintenance costs?</p>	Water fee revenue data	May be available from administrative data.
	Other own-source revenue used to fund water services (e.g., property tax revenue, fees from other services such as electricity, etc.).	May be available from administrative data.
	Amount of governmental grants used to fund operating and maintenance expenditures.	May be available from administrative data.
	Water service operating and maintenance expenditures.	May be available from administrative data.
<p>2. How do different municipal water pricing structures affect average household water consumption for poor households? (differences observed either by changing a structure from one year to the next, or by comparing two similar populations with different structures).</p>	Annual household income data for multiple years (or multiple locations when comparing tariffs in different places). Define indigent category and other categories of interest.	Recent data that can be matched to specific households may not exist. Recommend identifying a representative sample of poor households.
	Average monthly household water consumption by household income category.	Consumption levels should be available from administrative data. May be able to match with income data. Depending on data already gathered, may be able to look at the households' consumption over a number of years to identify trends, breaks in trends, and match with changes in pricing structures, local economic conditions, household size and income.

Question	Data Needed	Source
<p>3. How do different municipal water pricing structures affect revenue raising potential? (differences observed by changing a structure from one year to the next or by comparing two similar populations with different structures).</p>	<p>Average monthly household water consumption by household income category (income data needed to observe effects of income changes on water consumption).</p>	<p>Municipal records: consumption data should be available. May need to collect household income estimates for a sample of households.</p>
	<p>Average monthly household water service bill by household income category.</p>	<p>May be available from administrative data.</p>
	<p>Average monthly household water service actual payment by household income category.</p>	<p>May be available from administrative data.</p>
	<p>Elasticity of demand estimates for each income category (this would be useful if considering changing a structure and would like to estimate effects on revenue).</p>	<p>Likely need to obtain this from studies done with similar populations.</p>

Question	Data Needed	Source
4. How effective are metered communal standpipes at covering costs associated with providing FBW to scattered settlements?	Average cost of water provision through the communal standpipes (may collect average costs for standpipes in representative settlements: rural dense community, rural non-dense community).	May be available from administrative data or possible to calculate with the data. Likely have to interview water services staff and review financial records to create an estimate.
	Average revenue collected from standpipes.	May be available from administrative data.
	Average household water consumption for standpipe users.	May be able to calculate with estimates of number of households and consumption data.
5. Where a municipality is achieving cost recovery but not servicing all households, how might an expansion of FBW service to its unserved or underserved population compromise cost recovery and the ability of the municipality to balance its total budget?	Underserved settlements identified.	May be available from administrative data.
	Determine likely water service level to be provided (i.e., borehole with hand pump, communal standpipes, metered communal standpipes, yard taps, etc.).	Determine based on water service levels in similar communities and based on DWAF guidelines.
	Average operating and maintenance costs of water provision to the remaining settlements.	Average costs for similar, already serviced communities.
	Estimate revenue from these settlements, based on payment rates in similar areas.	May be available from administrative data.
	Estimate amount of revenue, if any, that could be channeled through cross-subsidization from other wealthier settlements.	Municipal budget.

Question	Data Needed	Source
<p>6. Examine the relative effectiveness of universal FBW provision through block tariffs as compared to targeted FBW with indigent rebates, or other option such as uniform pricing with rebate.*</p> <p>*Effectiveness of a block tariff also depends on the size of the blocks and the price set for each block. For more information regarding the use of block tariffs see the DWAF Free Basic Water Guideline for Local Authorities.</p>	Administrative costs of targeting.	May be available from administrative data.
	Operating and maintenance costs of providing FBW to the targeted households and to all households in the case of universal FBW.	May be available from administrative data.
	Number of poor households served FBW through targeted and universal FBW policies.	May be able to estimate. Similar information is submitted to the DWAF.
	Effectiveness index of each system.	Ratio of total costs to the number of poor households served with FBW.
	Expected water services revenue under the targeted and universal policies.	May be able to estimate from administrative data: average household consumption and payment rates. May need to use data from similar municipalities with targeted or universal FBW.

Question	Data Needed	Source
7. Compare private and municipal government water service providers in terms of cost recovery success and extent to which FBW is provided to indigent households.	Water fee revenue data.	May be available from administrative data.
	Other own-source revenue used to fund water services (e.g., property tax revenue, fees from other services such as electricity, etc.)	May be available from administrative data.
	Water service operating and maintenance expenditures.	May be available from administrative data.
	Amount of governmental grants used to fund operating and maintenance expenditures.	May be available from administrative data.
	Household income distribution of service areas.	Data may be available as part of indigent register. Otherwise may need to conduct a survey.
	FBW indigent population coverage in the service areas.	May be able to estimate. Similar information is submitted to the DWAF.
	Average monthly water consumption per capita for indigent population.	May be able to estimate after identifying indigent population.
	Metering, billing, and fee collection method description (e.g., unmetered standpipes, metered yard pipe with block tariff structure, prepaid meters, etc.).	Information obtained through administrative data, staff interviews and site visits.
	Settlement description: proportion of different settlement types in the service areas (e.g., urban, dense rural community, scattered settlements, etc.).	May be available from administrative data. See Water Services Development Plan.
	Obtain above data for multiple years to identify service level and cost recovery starting points and trends.	