WATER SERVICES

1 Introduction

Although significant progress has been made in providing water to households and communities who had no access to these services before 1994, sizeable backlogs remain. According to the 2011 census, 2.2 million households still lack access to the RDP-standard water supply, and over 5 million households (or 33%) experience problems with their supply. Growth in sectors such as agriculture, mining and energy also depends heavily on reliable access to water.

Providing water to households requires various processes: from raw water to bulk water and on to potable water. The flow of water is negotiated through a complicated institutional landscape that includes a Department of Water Affairs trading account, 15 water boards, district and local municipalities. This performance and expenditure review (PER) sheds light on the flow of funds in this complex landscape and the feasibility of increasing own revenue. Its objectives were to improve the understanding of the complex water services delivery chain, to analyse funding and expenditure trends, and to assess outcomes in the delivery of water services.

The PER was conducted between November 2014 and January 2016 by Isambulo AMI Strategic Consulting and Research, in consortium with Pegasys and TeCon Consultants. Some of its key outputs, insights and recommendations are summarised here; the full report and costing model are available at www.gtac.gov.za/programmes-and-services/public-expenditure-and-policy-analysis.

2 Water services institutional framework

The water services delivery cycle consists of four main phases:

- Storage of raw, untreated water in dams;
- Raw water abstraction, bulk water treatment (purification) and bulk potable water;
- Reticulation of water to consumers; and
- Collection and treatment of waste water and effluent, and their return to the river system.

Waste water treatment fell beyond the scope of this PER, although it is an important cost driver within the water services delivery cycle as a whole.

South Africa's extensive water services infrastructure includes 35 000 km of bulk pipelines, 200 000 km of reticulation pipelines, 1 028 water treatment works, 1 174 waste water treatment works (of which 821 are municipal works), and 3 802 pump stations. In 2013/14, about 987 new water infrastructure projects were being implemented across the nine provinces, of which 78% (or 723) were new water services projects, but still more are needed. Apart from expanding services, many of the existing assets are in a poor condition because of ageing infrastructure and inadequate

maintenance, and considerable investment in refurbishment and replacement is required. It is estimated that nearly 60% of municipal water infrastructure needs renewal. A 2012 report by the Department of Water and Sanitation estimated that new investment of about R400 billion is required over the next ten years to address these needs.

The National Water Act of 1998 regulates water use, including the allocation of water to municipalities for the provision of water services. The Water Services Act of 1998 regulates the supply of water services, establishes water boards, and sets out their powers and functions. Water boards are public entities established by the Minister of Water and Sanitation mainly to provide bulk water services to other water services institutions, but they may also provide reticulation and other services to municipalities. Water services authorities are metropolitan, district or local municipalities that are legally responsible for providing water supply and sanitation services to their residents, either directly themselves or by subcontracting other water service providers (such as water boards) to render these services.

The purchase price of raw, untreated water paid by water service providers to water boards and other supplier institutions varies markedly due to differences in infrastructure costs, treatment costs, and the distance to the consumer. The needs of the consumer (e.g. for household, industrial or agricultural use) determines the quality of water required. This in turn determines the extent to which the water must be treated and, ultimately, the tariff charged to the consumer. Because of this complexity, there is no single funding flow across the water services delivery chain. The configuration of this chain directly influences the tariffs paid by consumers.

3 Expenditure trends

The budgets and annual financial statements of a number of water services providers were analysed to obtain findings that could be generalised across the sector. These water service providers were: Umgeni Water Board, Magalies Water Board, eThekwini Metropolitan Municipality, Swartland Local Municipality, Rustenburg Local Municipality, Westonaria Local Municipality, and Vaalharts Water[1] (a water user association managing and operating government-owned water resources infrastructure). This sample included a range of models of water services authorities and providers, providing insights into the funding models in entities with different profiles in terms of topography, economic activity and geographical spread.

Key trends emerged from an analysis of the budgets of this sample of municipalities and water boards:

- *Bulk purchases* account for nearly 50% of municipal water services costs. Water services providers have little direct control over unit costs per kilolitre of bulk water purchased from water boards and other suppliers, but improving the efficiency of

[1] Chris Hani District Municipality was originally also selected as part of the sample. However, it failed to provide any data, despite various requests.

water use and reducing physical water losses will help reduce the volume of bulk purchases needed. Water loss is considerable – the physical loss of water in the sampled municipalities ranged between 4.4% and 28%, which negatively affects their revenues.

- *Repair and maintenance spending* varied between 4% and 23% of total expenditure in the sampled municipalities. Spending generally fell short of the levels required to maintain and improve the water infrastructure assets.
- *Water services tariffs* across the four municipal entities averaged about 69% of the actual cost of providing water, although the gap between tariffs and the cost of providing water varied. These figures do not include other operational grant funding, such as the Equitable Share grant into consideration. The tariff revenue data included in the water service providers' annual financial statements did not permit disaggregation by consumer type (commercial, residential etc.) The variation of the gap between tariffs charged and cost of provision by consumer type is an area meriting further analysis.
- *Expenditure by water boards* consists primarily (about 50%) of raw water and employment costs. Raw water costs are not very sensitive to volumes), therefore, reducing these costs will be difficult for water boards.

3.1 Weak revenue management undermines sustainability

The tariffs set by the four municipalities in the review did not cover the full cost of providing water. The shortfall averaged about 30% of total costs per cubic metre, which is both unsustainable and too large to be covered by the equitable share grant. Even if this variance were only 10% across all municipalities, it would mean that 10% more revenue could be collected if more cost-reflective tariffs were set. Based on the 2013/14 revenue estimates, this could amount to R2.5 billion a year when extrapolated across all municipalities. Setting tariffs to ensure that the actual costs are recovered would significantly enhance revenue from municipal water services.

A further challenge is that consumers do not pay for all of the water supplied. Reasons for this include ineffective revenue management systems, a failure to bill consumers, poor payment levels, and ineffective debt collection. Expenditure on revenue collection in the four municipalities reviewed varied between 2% and 14%. While 14% is probably too high, 2% is too low to achieve effective revenue management. An appropriate benchmark for the costs of revenue collection should be agreed upon, which decreases over time as the level of outstanding debt falls.

3.2 Physical water infrastructure should be substantially improved

The review found very high levels of non-revenue water (i.e. water that incurs costs but generates no income). This includes both physical water losses through leakages in the system and water for which consumers fail to pay. In the four municipalities reviewed, discrepancies between the volume of water sold and the volume of water managed

ranged between 18% and 58%. These numbers support recent estimates of non-revenue water being around 37% across municipalities nationally.

If repairs, maintenance and refurbishment of infrastructure led to a reduction of non-revenue water to 25%, the four municipalities could realise a saving of an additional R800 million per year. If such a reduction in non-revenue water were extrapolated across all municipalities, the R25 billion revenue collected for water services in 2013/14 could rise by about R5 billion a year. This would require major additional capital expenditure, but only a small increase in operating expenditure of between 0.2% and 1.3% a year (this excludes the refurbishment and upgrade associated with the additional capital infrastructure).

3.3 Accountability must be improved

Reporting on certain key performance dimensions of water provision, such as the condition of the infrastructure assets, is unsatisfactory. Better monitoring of the performance of water services providers could improve accountability and outcomes. Legislation and regulations call for asset condition to be monitored and require action when the condition of an asset falls below a particular level. In practice, the management of this activity is limited. Indeed, data on the condition of water infrastructure assets was hard to find. While the Blue Drop Index is comprehensive and includes reporting on asset management, the actual condition of assets tends to be obscured by the other measures in the index. A more disaggregated approach is needed to hold municipalities accountable for effective asset management.

In the absence of better data, the newly established economic regulator in the Department of Water and Sanitation may be unable to perform its functions effectively, and the National Treasury may likewise be unable to assess the financial requirements of municipalities. It is critical for the effective use of public financial resources that municipalities report clearly on asset management. The capacity of the economic regulator must also be bolstered to enable it to assess the financial implications of ensuring that assets are in good working order.

4 Costing model

The PER developed an interactive costing model for water services, which relates operational expenditure to performance and calculates the financial implications of various policy options. Capital costs per cubic metre of water differ significantly, based on factors such as topography and population density. The model therefore focused exclusively on operational spending to avoid distorting the relationships between year-on-year expenditure and performance.

Model users can enter various assumptions for each water service entity, such as the number of households, the types of connections, the volume of water supplied to industry and to commerce, and most importantly, the number of households without access to water. The model includes standardised historical expenditure; the volumes of

water procured, managed and sold by each water service provider and their associated tariffs. It provides a matrix of the unit costs of water per cubic metre across the water services delivery chain, which allows the unit costs to be forecasted over a five-year horizon as policy parameters are altered. The model also calculates the variance between the unit costs of water and the tariff being applied.

The model is flexible and can accommodate a number of policy permutations. The report, however, focuses on four main policy scenarios:

- *Reducing physical water loss* due to ageing infrastructure, which would increase maintenance spending but lower the purchase cost of bulk water.
- *Ensuring that all households have reasonable access to water* through eradicating access backlogs, using different service standards (e.g. piped water inside the dwelling, piped water inside yard but not in the dwelling, and public taps within 200 metres from the dwelling).
- *Reducing water usage* by 5% through demand management, which decreases revenues and bulk water costs but has little effect on the costs of water treatment and reticulation.
- *Improving water quality and maintenance* to achieve 98% or above, as per the Blue Drop Standard, which entails substantial operational cost increases; these are driven primarily by additional water treatment, maintenance and repair costs.

5 Findings

Expenditure performance and service delivery in the water services sector could be improved in a number of areas:

- *Revenue management and collection indicators*: It is recommended that the debt indicator in the costing model be operationalised and monitored rigorously, so that municipalities and the departments of Water and Sanitation and Cooperative Governance and Traditional Affairs can establish mechanisms to improve revenue collection, including the recovery of consumer debt. Expenditure on revenue collection by municipalities should also be monitored and limited to a benchmark, for instance, 5% of the total revenue except where there are high levels of outstanding debt (where it could rise to 10%). Measuring expenditure on water services revenue collection can be complicated in municipalities with consolidated debtors and debtor management systems.

- *Water services planning*: The entities' water services development plans ranged from non-existent to inadequate. The plans should contain annual budgets and projections of long-term capital requirements in line with the entities' annual performance plans and service delivery improvement plans, and should be submitted to the departments of Water and Sanitation and Cooperative Governance and Traditional Affairs, as well as the National Treasury. Using the costing model to determine the planned expenditure requirements should be part of this process, as

the model can be customised for each entity. It is recommended that the adequacy and comprehensiveness of these plans be audited, rated, reported and monitored.

- *Linking operating and capital expenditure better:* Water is delivered to consumers through infrastructure owned by water boards, municipalities and water user associations. Capital expenditure, which was not examined in this review, is raised through debt, revenue and grant funding, and is recorded as transfers. It is recommended that the capital expenditure of water services entities be reflected as performance information to facilitate the efficient delivery of infrastructure projects. All 723 water services infrastructure projects being implemented should be linked to a responsible water services entity to ensure that operating and capital expenditure are managed rigorously until the project is completed. It is likewise important to introduce performance indicators on the implementation of capital projects for each water services entity, by utilising data from the entity and the Department of Water and Sanitation.
- *Reporting on the condition of water services infrastructure assets:* The condition of water infrastructure assets should be measured as a stand-alone indicator under the Blue Drop Index. This will provide a clear indication of the status of municipal infrastructure, trends in asset condition, and budgetary requirements for refurbishment and replacement. Better reporting on these issues is critical to addressing one of the most significant challenges facing the sector. While external reporting is important, it is even more crucial that water service providers strengthen their internal asset information management systems for better infrastructure development and long term financial planning.
- *Water services performance data standardisation:* To avoid inconsistencies in the reporting of key performance data, such reporting should be standardised and aligned with the goals of water services policy. An approach similar to the introduction of a Standard Chart of Accounts would greatly enhance monitoring and evaluation. It would also improve the accuracy of the water services costing model, as standardised data would be readily available; this would allow consistent comparisons of performance across similar water services entities.