

**SA-TIED**

Southern Africa – Towards Inclusive Economic Development

REPORT

# Water regulation business case

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April 2022



**Abstract:** After the South African democratic transition, substantial advances were made in the provision of water services to households which had previously not been supplied. However, more recently, the pace of progress has slowed, and technical and financial problems in water services have increased. Most water activities are currently undertaken by national and local government, with little private participation. The paper examines whether there is a business case for the introduction of an independent water regulator in South Africa by examining the evidence base at each stage of the water supply chain. Recommendations are also made as to what complementary economic and structural reforms may be needed.

**Key words:** water regulation, water corporatization, business case for regulation

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## About the project

### Southern Africa –Towards Inclusive Economic Development (SA-TIED)

SA-TIED is a unique collaboration between local and international research institutes and the government of South Africa. Its primary goal is to improve the interface between research and policy by producing cutting-edge research for inclusive growth and economic transformation in the southern African region. It is hoped that the SA-TIED programme will lead to greater institutional and individual capacities, improve database management and data analysis, and provide research outputs that assist in the formulation of evidence-based economic policy.

The collaboration is between the United Nations University World Institute for Development Economics Research (UNU-WIDER), the National Treasury of South Africa, the International Food Policy Research Institute (IFPRI), the Department of Monitoring, Planning, and Evaluation, the Department of Trade and Industry, South African Revenue Services, Trade and Industrial Policy Strategies, and other universities and institutes. It is funded by the National Treasury of South Africa, the Department of Trade and Industry of South Africa, the Delegation of the European Union to South Africa, IFPRI, and UNU-WIDER through the Institute's contributions from Finland, Sweden, and the United Kingdom to its research programme.

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# REPORT

## **Water regulation business case**

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April 2022

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## 1 Introduction

There is at present no independent water regulator in South Africa. Instead, price regulation is overseen by the national Department of Water and Sanitation (DWS), which also has numerous legislative mandates as regards the provision of water resources and services. Post 1994, during the early years of the democratic transition, substantial advances were made in the provision of water services to households which had previously not been supplied, in realization of the constitutionally guaranteed right to access to water. However, more recently, the pace of progress has slowed, and technical and financial problems in water services have increased. The net effect has been an erosion of the security and quality of water supply, and in a number of municipalities, substantial crises in water supply.

The establishment of an independent economic regulator has long been flagged as a possible means of addressing the issues the sector faces. DWS has done substantial work on the introduction of independent economic regulation, with the initial policy proposal made in 2002,<sup>1</sup> and including formal discussions held in 2012 to determine the parameters of such a regulator.<sup>2</sup> However for some stakeholders in the sector the question remains as to whether economic regulation is in fact the best available policy reform for the sector at this time.

This business case goes back to first principles and examines whether a case can be made for such an independent water regulator. The document begins by providing some background on the South African water sector, and then reviewing what the literature suggests the benefits of independent economic regulation typically are. The analysis then considers whether independent economic regulation is the right tool to address the identified problems in each water sub-sector, and if not, provides some initial thoughts on what kind of policy response is likely to be appropriate.

## 2 Water in South Africa

Any discussion of the potential for independent regulation of water in South Africa needs to take into account the nature of South Africa's water supply. Hydrological conditions are highly variable between different regions of the country, and within each region itself rainfall also tends to fluctuate substantially. As a result, van Rooyen et al (2011) point out that water storage infrastructure is critical to smooth supply conditions, as follows:

The large variations in the flow to rivers invariably mean that storage is required to make sufficient quantities of water available for users at times of low flow. The storage in dams is required not only to store water from the wet months of the year in order to be used in the months when river flow decreases dramatically and sometimes ceases to flow, but also over drought periods where the river flow could be very low for many consecutive years.<sup>3</sup>

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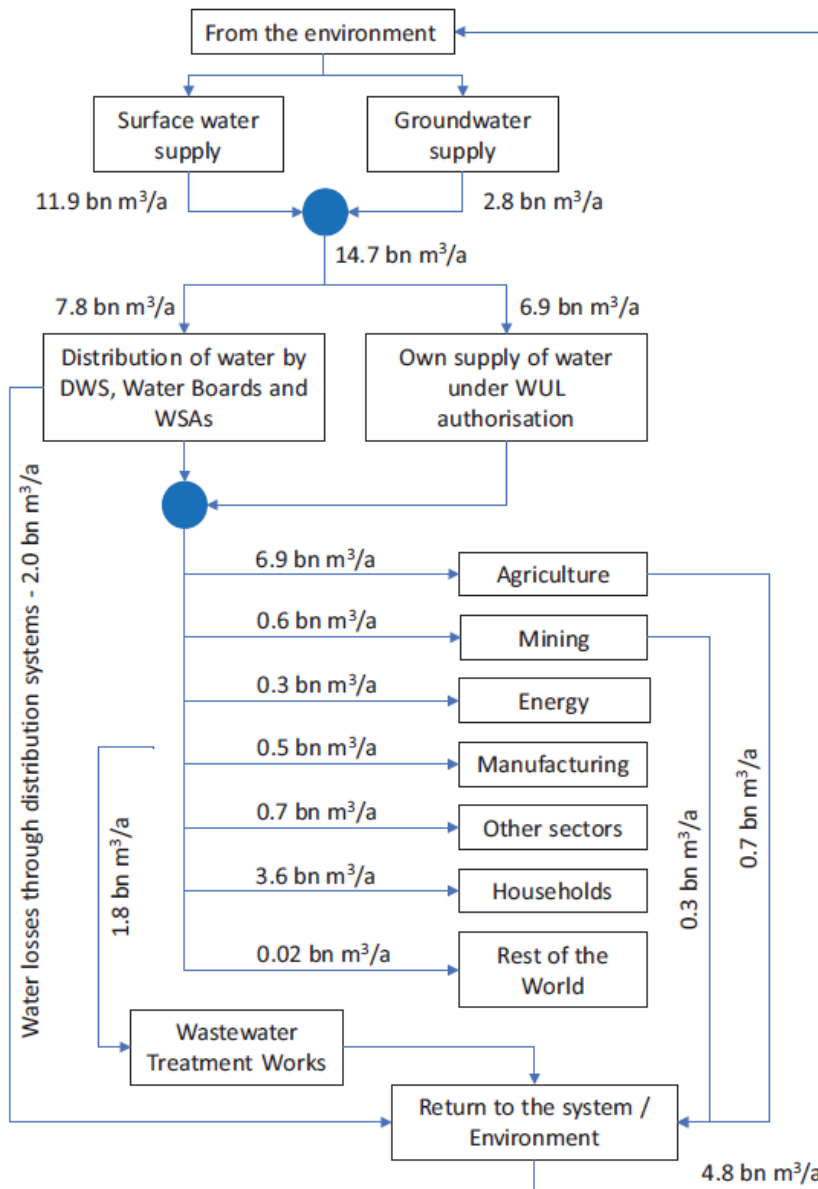
<sup>1</sup> DWAF (2002: 31)

<sup>2</sup> See documents at <https://www.dws.gov.za/Projects/PERR/EconomicReg.aspx>

<sup>3</sup> Van Rooyen et al. (2011: 22)

In 2016, total water supply in South Africa was estimated at 14.7 billion m<sup>3</sup> per annum, generating total revenue of R66.5 billion.<sup>4</sup> As shown in Figure 1 below, the bulk of water used came from surface water supply, and just over half of water used is distributed by DWS, water boards or water service authorities. The rest of water used is derived from own supply under water use licenses (WUL) issued by the DWS.<sup>5</sup>

Figure 1: A simplified graphic representation of the water balance for South Africa (2016)



Source: reproduction of Figure 2 in Maila et al. (2018: vii), with permission.

As shown in Figure 2 below, the largest component of own use water is the agricultural sector. The infrastructure used to supply water on farms can be fairly simple, and controlled by an

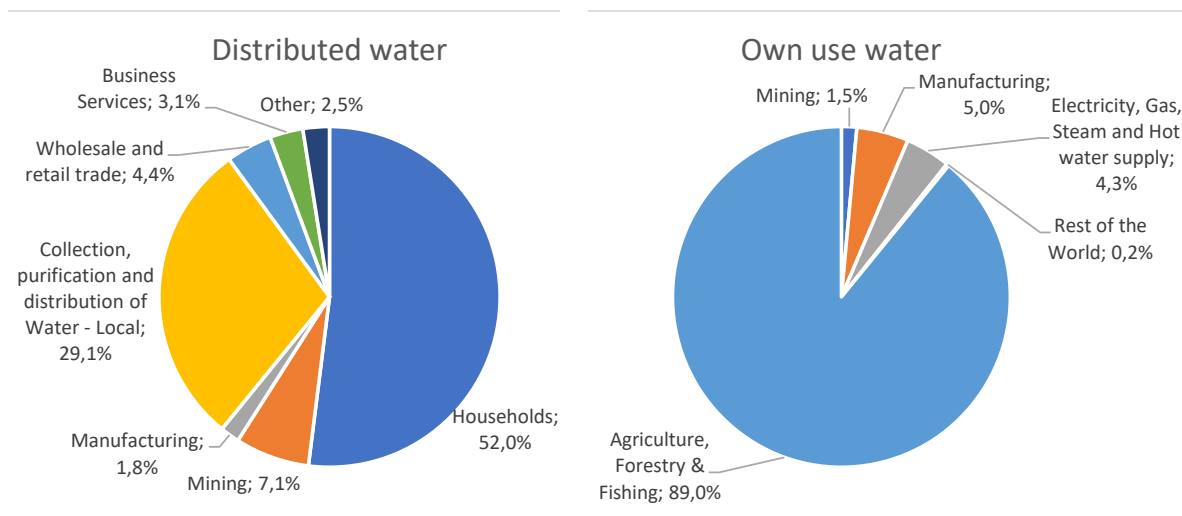
<sup>4</sup> Maila et al. (2018: v)

<sup>5</sup> It should be noted that own use water licences are still typically reliant on the national water infrastructure to ensure continuity of supply, for example through the release of dam water in the dry season.

individual farmer. However, in a number of cases farmers have formed Water User Associations to manage the necessary infrastructure, which may then in turn be owned by the association itself or by DWS.<sup>6</sup>

Regardless of how water is supplied for own use, it is still typically dependent on the national system of water resource management for continuity of supply. The entity which ultimately bears policy and operational responsibility for such water resource management is DWS. The National Water Act, 1998, empowers the DWS to delegate some of these resource management tasks to Catchment Management Agencies, but in practice the establishment and implementation of the CMAs has to date been slow and is as yet incomplete.<sup>7</sup>

Figure 2: Use of water by sector, distributed water contrasted with own use water



Source: author's elaboration based on Maila et al. (2018: 24).

The picture for distributed water is very different, with the principal customer base being households. The process of providing distributed water typically relies on a more complicated and expensive physical and institutional infrastructure than does own use water. Many of the entities involved are established in terms of the Water Services Act, 1997. In the order in which they appear in the Act, they are as follows:

- **Water services authorities (WSAs):** water services authorities are defined in the Water Service Act as “any municipality.... responsible for ensuring access to water services.” The Act then further places on each WSA “a duty to all consumers or potential consumers in its area of jurisdiction to progressively ensure efficient, affordable, economical and sustainable access to water services.” WSAs may provide water services themselves (in which case the water business must be managed and accounted for separately), may contract in a water services provider to do so, or may form a joint venture with another water services institution to do.
- **Water services providers (WSPs):** water services providers may only operate in areas where they have been authorized to do so by WSAs, and their performance must be managed by the WSA

<sup>6</sup> Muller (2007: 14)

<sup>7</sup> DWS (2018(a): 39)

- **Water services intermediaries:** WSAs may also appoint water services intermediaries
- **Water boards (WBs):** water boards are first and foremost suppliers of bulk water to municipalities and other large users, but may also take on functions such as raw water and wastewater management
- **Water services committees:** these are intended to be temporary structures to provide water services where no WSA is in place, and in fact the Act prohibits them from operating in areas where a WSA is effectively providing services. Their use has decreased since the 1990s

A typical value chain for distributed water would see raw water converted into bulk water by a Water Board, then supplied to a municipality, and finally to an end customer. However in practice the manner in which water is distributed differs from system to system, and the number and nature of entities involved in each system can be substantially different. Table 1 below illustrates how value chain activities are carried out in a typical municipality, and how that can differ.

Table 1: Activities in the water supply value chain

<b>Function</b>	<b>Typical</b>	<b>Extensive intermediaries</b>	<b>Limited intermediaries</b>
<i>Natural resource</i>			
Resource management	DWAF	DWAF	DWAF
Seasonal storage	DWAF	Water Board	Municipality
Regulated release into river/stream	DWAF	Water Board	Municipality
(Inter-system transfers)	DWAF	Water Board	Not required
<i>Water supply service</i>			
Abstraction from dam/river	Water Board	Water Board	Municipality
Treatment	Water Board	Water Board	Municipality
Transmission	Water Board	Water Board	Municipality
Peak storage	Municipality	Municipality	Municipality
Distribution to consumers	Municipality	Municipality	Municipality
<i>Example</i>	<i>Johannesburg</i>	<i>Polokwane</i>	<i>Steve Tshwete (Middelburg)</i>

Source: reproduced from Table 1 in Muller (2007: 15), with permission.

Sanitation services form the final component of the water cycle, and the treatment of waste water plays an important role in ensuring the quality of raw water, as illustrated in Figure 3 below. Section 3 of the Water Services Act places an obligation on all water services institutions to “take reasonable measures to realise” the right to access basic sanitation. In practice, however, the institutions which are most typically responsible for providing sanitation services are municipal WSAs and WSPs.<sup>8</sup> While the DWS retains responsibility for regulating sanitation services, and oversees the bulk reticulation system, in practice the Department of Human Settlements (DHS) has been responsible for much of the infrastructure development in sanitation at household level.<sup>9</sup>

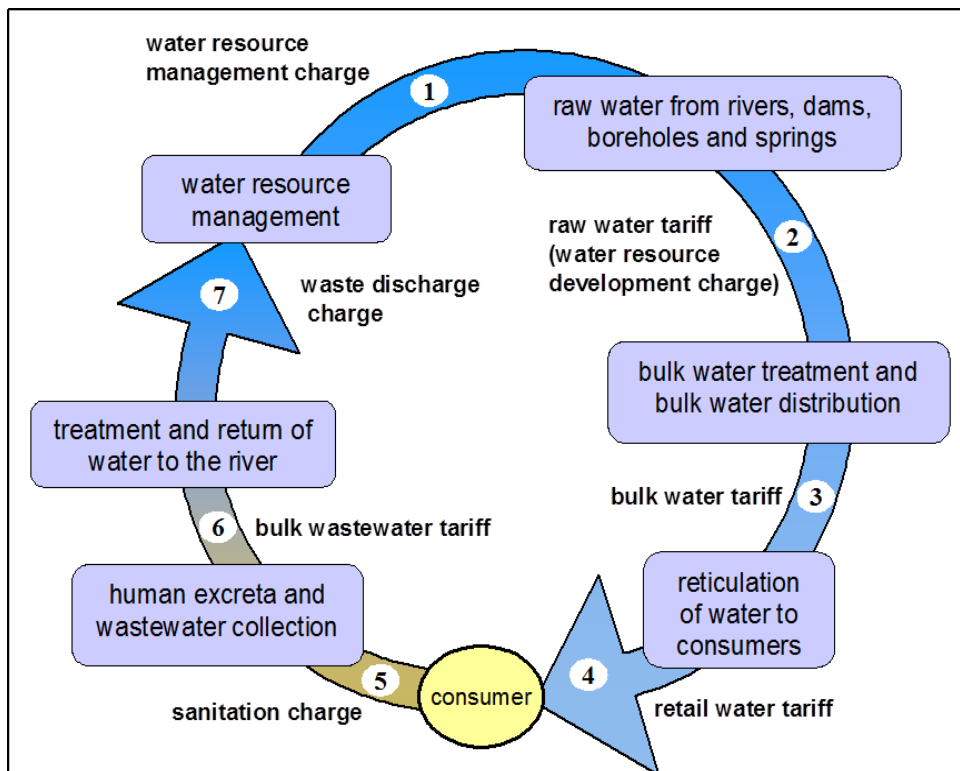
<sup>8</sup> Tissington (2011: 49)

<sup>9</sup> Tissington (2011: 51)



Figure 3 below illustrates the various components of the water cycle. It encompasses a wide range of institutions, carrying out quite different activities, and facing different problems and challenges. To date, the position of DWS has been that the “Economic Regulator must cover the whole water value chain.”<sup>10</sup> However, the different operating conditions in each of these subsectors implies that, the regulatory approach taken will probably need to differ between them as well. It may also be the case that, while independent economic regulation would be beneficial for some parts of the water value chain, it would not work in others. The analysis will thus examine the case for independent regulation in each sub-sector separately. First, however, a review of the literature on the case for economic regulation itself is required.

Figure 3: Economic Regulator must cover the whole water value chain



Source: DWA (2013(a)).

### 3 Economic regulation and the water sector

While modern states intervene in economic activity in a variety of ways, for example to set safety standards or reduce carbon emissions, economic regulation itself focuses on “the efficient use of resources through promoting or ensuring efficient investments and operations and ensuring appropriate pricing.”<sup>11</sup> Ideally, economic regulation should only be undertaken where the costs of doing so are outweighed by the benefits generated. Such costs can be substantial, involving for example the costs of collecting and analysing data, monitoring behaviour and enforcing regulatory standards, and penalizing non-compliance. This implies that economic regulation is only appropriate in sectors where there are sustained problems with ensuring that investment occurs at

<sup>10</sup> WA (2013)

<sup>11</sup> Palmer Development Group (2004: 3)

its efficient level, operating conditions are inefficient, or where prices are systematically set too high or too low.

The first way in which these kinds of problems can arise is due to imperfect markets. Economic theory holds that competitive markets are very good at ensuring that price levels are set at their optimal level. However, not all markets operate efficiently, and in some sectors the existence of natural monopolies means that competition will never be (efficiently) possible. This occurs, for example, if efficiency is only maximized at a very large level of production. In that case, the most efficient operator may be big enough to supply the whole market alone, and introducing competition would actually increase average production costs and reduce efficiency. However, in this situation the natural monopoly firm will itself behave inefficiently – usually it will increase prices above their efficient level, in order to earn monopoly profits, and in doing so cause quantity demanded to fall below its efficient level. It may also take advantage of what has been described as the best of all monopoly profits – a quiet life.<sup>12</sup> Natural monopolies have much less pressure on them to keep operational efficiency levels high, and thus are often technically inefficient.

In this kind of market, regulatory intervention can help to address the market failure, by keeping prices at a competition-equivalent level. At this lower price level, the firm is then also forced to improve its technical efficiency, in order to maintain profitability. Mummsen et al argue that, in water services, “[r]egulation is necessary because WSS service providers, especially in urban and peri-urban areas and increasingly even in rural contexts, are natural monopolies, with no competition in the market. As a result, there is little pressure on service providers to maintain service quality, operate efficiently to keep prices down, and serve marginal and less profitable areas.”<sup>13</sup>

A second set of problems which can distort prices and investment, and create a rationale for economic regulation, have to do with political interference. The political demands of the election cycle mean that political decisionmakers are always under pressure to deliver short term economic gains to their constituencies, even if doing so leads to economic inefficiency in the longer term. Stern and Trillas (2002) summarise this “time inconsistency” problem in the context of monetary policy as follows:

- Governments always have an incentive to have a short-term monetary expansion to boost economic growth and reduce unemployment just before an election leaving the next government to deal with the resulting inflation; and
- market participants know that Governments have such an incentive so that they are very likely to discount Government statements on the need for a stable anti-inflationary policy, however strongly made.<sup>14</sup>

In infrastructure sectors, political pressure is likely to be used to exert downward pressure on the price of services in order to assuage voters. If prices are kept too low to repay the cost of infrastructure,<sup>15</sup> then private investors will not enter the market, as they know they will be unable to make a profit on their investment. The argument is thus that independent regulation is needed

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<sup>12</sup> Expression commonly attributed to Sir John Hicks

<sup>13</sup> Mummsen, Saltiel, Kingdom, Sadik, and Marques (2018: 11)

<sup>14</sup> Stern and Trillas (2002: 6)

<sup>15</sup> Revenue collections may also be affected by political pressures to avoid cutting off non-paying customers. Low prices are thus not the only potential cause of revenue inadequacy.

to ensure investment occurs, as government is not able to credibly commit to prices which are high enough to cover costs.

In the 1990s, the introduction of independent regulation became increasingly associated with the package of reforms commonly referred to as the “Washington consensus,” which emphasized the potential benefits of privatization and deregulation. The role of the regulator in this policy package was to simultaneously constrain the monopolistic excesses that a newly privatized, profit-maximising natural monopoly might aspire to, while also protecting potential investors in that privatized firm from political interference.

Arguably, the way in which regulators were designed was increasingly driven by the requirements of the privatization agenda,<sup>16</sup> rather than by a more balanced policy of improving overall social and economic outcomes. This was probably influenced by the fact that a number of developed countries had successfully undertaken privatization and regulation of previously state owned entities in this time period. While privatization can certainly be used to effect positive social change, a regulator which is too focused on protecting the commercial interests of private investors can be insufficiently attuned to constraining prices, improving efficiency and ensuring that investment levels are maintained. These problems are often more noticeable in less developed countries, where universal service provision has not yet been achieved, and as a result the importation of this kind of regulatory model into less developed countries has often proved problematic.<sup>17</sup>

At present most water services in South African are delivered by state owned entities. While private investment in independent water production has recently been identified as a policy initiative,<sup>18</sup> there is no privatization policy in the sector, and thus regulatory design will primarily deal with the needs of a state-controlled sector. It can feel counterintuitive to introduce a separate regulator to intervene in sector outcomes, when the state is already the owner of a company, and thus notionally fully able to control it. However in practice such control can be difficult to exercise, and Berg (2013) notes that “on balance the arm’s-length regulation of public service providers yields better sector performance than left to the devices of the line ministry to achieve solely through the fiat of ownership.”<sup>19</sup>

However, Groom et al (2006: 7) suggests that regulators of state owned entities often face very different types of problems than regulators of private entities, as follows:

For a long time economic regulation focused on private providers in developed countries, where the concern was that the provider would charge too much. The tools of traditional regulation are therefore largely concerned with stopping prices from rising too high.

However, we often observe that publicly owned providers, particularly in developing countries, charge too little. Charging below cost is meant to help consumers, but is generally counterproductive. When tariffs are below cost, the

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<sup>16</sup> Muller (2013: 2)

<sup>17</sup> Mumssen, Saltiel, Kingdom, Sadik, and Marques (2018: 16)

<sup>18</sup> President Cyril Ramaphosa: 2020 State of the Nation Address. 13 February 2020. Accessed at <https://www.gov.za/speeches/president-cyril-ramaphosa-2020-state-nation-address-13-feb-2020-0000> on 14 October 2021

<sup>19</sup> Berg (2013)

provider must either rely on government subsidies or cut back on service, maintenance, and investment.<sup>20</sup>

Groom et al also emphasize the importance of clarity as regards what roles may be appropriately performed by regulation, and which should be kept separate from the regulatory function. They identify three areas which they describe as “vital government roles in the water sector that complement regulation, but are distinct from it,” as follows:

- **Policy Making.** Water policy defines the “ends and means” for the sector (that is, it defines sector objectives and principles and sets out who should do what to achieve those objectives). The extent to which consumers or taxpayers should pay for water services and infrastructure is a policy decision, as is the ownership of the providers and the general strategy for controlling tariffs and service standards.
- **Ownership, Service Provision, and Governance.** Water provider performance is driven largely by four factors: who owns the water assets (asset ownership), who owns the service provider (utility ownership), who is responsible for delivering service (service provision), and how the owner exercises control over the utility’s management (governance). In most developing countries, water utilities and assets are owned by the government. The government may retain responsibility for service provision or transfer it to a private provider. A government may establish good governance procedures by exercising effective control over the utility through a well-functioning board. Getting these four things right is critical to sector performance. They must align with the regulatory design, but they are not themselves regulation.
- **Coordination.** Governments must coordinate the water sector. This involves ensuring that policy decisions and implementation plans are consistent, managing input from the various bodies involved in water sector activities and coordinating water development with other public expenditure priorities. The regulatory regime must be coordinated with other interventions, but coordination is not regulation.<sup>21</sup>

These clear role distinctions are critical to the effective performance of regulation, and the efficiency of the regulated sector, regardless of whether the firms providing water services are state or privately owned.<sup>22</sup> If the regulator is to act as a ‘referee’ of sector economic performance, it cannot also be asked to play in the game, without creating conflicts of interest that will affect its performance. Berg (2013: 10) summarises the problem as follows:

One could ask whether there is a need for a separate regulatory institution when the utility is state- or municipally-owned. Presumably, the water ministry (perhaps

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<sup>20</sup> Groom, Halpern and Ehrhardt (2006: 7)

<sup>21</sup> Groom, Halpern and Ehrhardt (2006: 11-12)

<sup>22</sup> It should be noted that during disasters and emergencies, governance systems will likely need to have explicit carve-outs that grant the executive more power for the length of the emergency. Building these exceptions into legislation helps to ensure that disaster management can be accomplished without damaging the overall principle of separation of functions.

in conjunction with the finance ministry) is already providing oversight for national water utility operations. Similarly, if municipal taxpayers own the utility, the elected officials serving on the municipal council or commission should be monitoring and incentivizing utility managers to improve performance. However, the question answers itself: **when both operations and oversight are part of the same organization, pressure for strong performance is unlikely since reforms represent a public admission that past procedures were inadequate (at best) or corrupt (at worst).**<sup>23</sup> [emphasis added]

In a review of economic regulation of state owned entities in South Africa, Steyn (2011) also emphasizes the need to separate key governance roles into different institutions to reduce conflicts of interest. Steyn's research suggests that one of the key causes of underperformance of South African economic regulators has in fact been a tendency for senior officials "undermine the separation of powers established for the effective functioning of policy formulation, SOE regulation and corporate governance."<sup>24</sup>

Establishing the regulator with effective operational autonomy can thus be an essential structural change to the governance of the sector. Once separate from policymakers, the regulator is then better positioned to effectively critique the performance of the sector. However, independent regulation is not a panacea, and additional sectoral changes will often be needed in order to realise the full benefits of such independent regulation. In particular, it is also important to ensure that the internal governance systems of service providers are adequate. If the service provider is still under political control, for example, regulatory decisions may simply be ignored. Berg (2013: 12) argues that it is key that the service provider "must be in a position to introduce incentives, evaluate managers, and remove those who are unwilling or unable to do their jobs."<sup>25</sup> This is likely to have implications for the legal form of the service provider.

### **3.1 Economic regulation, access and affordability**

Economic regulation, as set out above, concerns itself primarily with the efficient functioning of markets. However, efficient markets often do not produce socially equitable outcomes, and the very poor often cannot afford to pay a price which reflects the true market value of a good or service. For a resource such as water, which is necessary for health and human dignity, methods need to be found to ensure that the pursuit of economic efficiency through regulation does not come at the expense of human misery.

The issues raised by cost reflective price regulation more be more severe for rural communities. Consumers in isolated rural areas are also often more expensive to service, for example because it is more difficult to achieve economies of scale in service provision, or because reticulation networks have fewer customers per kilometer of pipe. This means that cost reflective prices will tend to be higher for communities which may already suffer from the economic effects of geographical isolation, making companies less likely to invest in providing access to these communities to begin with.

Achieving social objectives as regards affordability and access typically makes the task of regulation more complex. At its core, the issue of access and affordability tends to boil down to the question

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<sup>23</sup> Berg (2013: 10)

<sup>24</sup> Steyn (2011: 30)

<sup>25</sup> Berg (2013: 12)

of how to finance service provision for consumers who cannot afford cost reflective prices. Two sources of funding are available – cross-subsidisation between consumers, and direct subsidization of poor consumers by the state.

The cross-subsidisation path relies on the ability of the operator to raise prices above the cost-reflective level to some consumers, either because they are wealthy and can afford a higher price, or because their demand is inelastic for some other reason. By raising prices for these types of consumers, the operator is able to raise additional funds that can then be used to cross-subsidise services to the poor. It should be noted that this model becomes very inefficient if it is not possible to easily discriminate between customers who need subsidization and the rest of the market. Gerlach (2008: 46) notes that it is common to find that “subsidy schemes are plagued with high errors of inclusion (subsidies captured by the non-poor).” Conversely, subsidy schemes may also then fail to reach the targeted population.

Allowing the regulated entity to set prices above cost reflective levels for some consumers also increases the complexity of the regulatory task. It is often difficult for the regulator to know exactly how much extra revenue the operator needs to collect to fund its social obligations, and thus to ensure that the price regulation system continues to incentivize efficiency. Social obligations that are expressed simply in terms of number of new connections can also be problematic if they do not account for price effects. For example, Horwitz & Currie (2007: 446) note that the achievement of service obligations placed on Telkom at its partial privatization were reversed by its pricing policy, as follows:

[Telkom]...satisfied the letter of its rollout obligation to build 2.81 million new lines, but not the spirit of its universal service mandate. Telkom’s high prices for installation, rental, and calls (and sociologically inappropriate billing mechanisms in rural areas) resulted in the disconnection of the vast majority of the new lines.

Direct subsidization of poorer consumers by the state can also create complexities. As with cross-subsidisation, direct subsidies also tend to reduce the efficiency incentives faced by firms. From a regulatory standpoint, while the regulator typically has a role to play in monitoring the achievement of social objectives on access and affordability, the regulator typically does not control the subsidy funds supplied to operators, which as Kirkpatrick & Parker point out, leads to “a disconnect between economic regulation and social policy.”<sup>26</sup> Inconsistencies between policies on access and affordability and fiscal decisionmaking can put the regulator in a very difficult position.

Finally, much of the impact of policies on affordability and access depends on the incentive systems created by the design of the program. The devil, in other words, is in the details, and it is essential that the impact of such interventions be constantly monitored and system design be continuously refined to avoid unanticipated consequences. All of these factors speak to the necessity of a well designed and resourced sector regulator.

#### **4 Business case for regulation by value chain level**

Given the foregoing discussion of economic regulation, the case for economic regulation depends on the existence of sustained problems as regards pricing, investment levels and operational efficiency. The extent of these problems is now discussed, in each subsector of the water value

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<sup>26</sup> Kirkpatrick and Parker (2005)

chain. Analysis is also provided of what kinds of regulatory interventions are possible in each sector, and the likelihood that such interventions will in fact be able to improve economic and social outcomes. Finally, a case is made as to whether the problems involved can best be addressed by regulation, or require alternative or complementary reforms. Section 5 provides more detail on what functions an independent regulator could perform.

## 4.2 Raw water, and water resource management and development

The primary statutory framework for water resource management and development is the National Water Act, No 36 of 1998. Section 3(3) of the Act states that “The National Government, acting through the Minister, has the power to regulate the use, flow and control of all water in the Republic,” and then establishes the basis on which entitlements to use water are identified. The responsibility for the development of a national water resource strategy is reserved for the DWS, and this strategy must “establish water management areas and determine their boundaries.”<sup>27</sup> Catchment management agencies may then be established as regards specific water management areas, and must “establish a catchment management strategy for the protection, use, development, conservation, management and control of water resources within its water management area.”

As at 2018, only two of the nine planned catchment management agencies (CMAs) had been established, and no functions had been delegated to them as yet.<sup>28</sup> As such, DWS remains responsible for performing catchment management functions.<sup>29</sup> Such catchment management functions centre largely around control of the ecological framework of water, and are labour rather than asset intensive. They also include the issuance of water use licences. Catchment management activities are also sometimes performed on an ad hoc basis, for example by water boards seeking to improve the quality of raw water supply.

DWS owns and controls much of the raw water infrastructure currently in place, although in some areas raw water infrastructure is also managed by water services authorities or water boards.<sup>30</sup> While in many areas raw water is sold as a product of the DWS infrastructure, in other areas it is an intermediate product produced by firms which then treat and on-sell it as bulk or municipal water. In addition, raw water can also be accessed directly by end users who have water use licences – in the agricultural sector in particular, unpurified water is often used as is, and is thus an end product rather than an intermediate product.

Chapter 5 of the National Water Act gives the Minister of Water and Sanitation (with the concurrence of the Minister of Finance), the ability to “establish a pricing strategy for charges for any water use.”<sup>31</sup> These charges are then “payable to the relevant water management institution.”<sup>32</sup> The Act provides substantial detail on how the pricing strategy may be determined, as follows:

S56(2) The pricing strategy may contain a strategy for setting water use charges -

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<sup>27</sup> National Water Act, No 36 of 1998, section 6(1)(c)

<sup>28</sup> DWS (2018(a): 39)

<sup>29</sup> DWAF (2007: 7)

<sup>30</sup> Muller (2007: 25)

<sup>31</sup> National Water Act, No 36 of 1998, section 56(1)

<sup>32</sup> National Water Act, No 36 of 1998, section 57(2)

- (a) for funding water resource management, including the related costs of -
  - (i) gathering information;
  - (ii) monitoring water resources and their use;
  - (iii) controlling water resources;
  - (iv) water resource protection, including the discharge of waste and the protection of the Reserve; and
  - (v) water conservation;
- (b) for funding water resource development and use of waterworks, including-
  - (i) the costs of investigation and planning;
  - (ii) the costs of design and construction;
  - (iii) pre-financing of development;
  - (iv) the costs of operation and maintenance of waterworks;
  - (v) a return on assets; and
  - (vi) the costs of water distribution; and
- (c) for achieving the equitable and efficient allocation of water.

This framework establishes the basic principle that raw water prices should be sufficient to cover the costs of water resource management and infrastructure provision. However, the Act also allows for the manner in which prices are set to be varied for a wide range of reasons, some of which are consistent with cost recovery principles, and some of which are not. Section 56 of the Act specifies the following factors that may influence the price strategy:

- Geographic area (socio-economic, physical or demographic attributes)
- Type of water use:
  - “56(4)(b)(i) the manner in which the water is taken, supplied, discharged or disposed of;
  - (ii) whether the use is consumptive or non-consumptive;
  - (iii) the assurance and reliability of supply and water quality;
  - (iv) the effect of return flows on a water resource;
  - (v) the extent of the benefit to be derived from the development of a new water resource;
  - (vi) the class and resource quality objectives of the water resource in question; and
  - (vii) the required quality of the water to be used”
- Different types of water users (based on characteristics such as the extent of water use, the quantity of water they return to the water resource, the user’s economic circumstances, and “the statistical probability of the supply of water to them”)
- Rebates and waivers of charges

The current pricing strategy, which sets out how all these factors are to be balanced during the implementation process, was put in place in March 2007. The pricing strategy repeatedly highlights the risk that, “if water use charges are set too low, they will lead to underinvestment, over-consumption and unwarranted fiscal subsidies.”<sup>33</sup> The overall objective of the pricing policy is to

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<sup>33</sup> DWAF (2007: 17)



ensure financial stability by recovering the full financial cost of water provision from water users, with the resulting price increases phased in to allow users to adjust to higher prices.<sup>34</sup>

The phasing in approach differs by water use sector, and by the component of the raw water price concerned. For water resource management charges, the following phasing in approach is used:

#### 6.5.1 SFRA (Forestry) Cap

WRM charges to the forestry sector are capped at R10 per hectare plus Producer Price Index (PPI) rate (%) at April of each year with 2002-03 financial year as the base year. Resource poor foresters and non-irrigation growers with land equal or less than ten hectares under cultivation will be excluded from this charge.

#### 6.5.2 Irrigation Cap

Water Resource Management charges to the irrigation sector are capped at 1.5 cent per m<sup>3</sup> plus the PPI rate (%) at April of each year with 2007-08 as base year. In instances where the actual 2006/07 charges to the agricultural sector as calculated under the 1999 Pricing Strategy would have been higher than the capped amount of 1.5 cent per m<sup>3</sup> (because of the impact of PPI resulting in charges above 1.5 cent in previous years), then the higher actual charge will be used as the base charge for charge setting purposes.<sup>35</sup>

There are also phased in charges for resource poor farmers and forest growers, as well as a subsidy policy for these users. As at 2018, black farmers used only about 5% of water in the agricultural sector,<sup>36</sup> and thus this dispensation for resource poor farmers<sup>37</sup> is unlikely to have a material effect on sector financial sustainability.

Phasing in of consumptive charges for water resource development and use of waterworks is undertaken as follows:

#### **Domestic/Industrial/Mining/Energy sector**

Annual increases for existing state funded schemes will be limited to 10%+ PPI (rate taken in April) until full cost recovery is reached...

#### **Agricultural sector**

Established farmers

- (a) Full Operation and Maintenance costs will be recovered annually, with an annual increase limited to 50%
- (b) Depreciation charges for existing schemes will be capped at 1.5 cents per meter<sup>3</sup> plus PPI (rate) with 2007/08 as base year, with annual increase limited to 20% of the previous years charge.

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<sup>34</sup> DWAF (2007: 5)

<sup>35</sup> DWAF (2007: 15)

<sup>36</sup> DWS (2018(a): 17)

<sup>37</sup> Not all black farmers are resource poor farmers, and vice versa. However, the historical inequities of the apartheid system have resulted in a pattern of income distribution which is still largely based on ethnicity.

(c) Full financial cost recovery (including ROA) for new schemes.<sup>38</sup>

Again, various concessions and subsidies are also made available to resource poor farmers, to be subsidized by the fiscus.

The party responsible for implementation of the water pricing strategy is the DWS. A separate directorate has been established within the Department which houses economic regulation capacity, and proposed raw water prices are workshopped with stakeholders on an annual basis before implementation.

#### *4.1.1 Trans-Caledon Tunnel Authority and the National Water Resource Infrastructure Agency*

While the bulk of raw water infrastructure is funded by either raw water tariffs or fiscal subsidies, private sector funding has also been used for parts of the system. The funding and implementation mechanism used for such projects has to date been the Trans Caledon Tunnel Authority (“TCTA”). TCTA projects are set up with an offtake agreement with its bulk customers, and DWS implicitly guarantees repayment, to ensure investor returns are stable. Ultimately TCTA is used to fund projects where it is expected that users will be able to afford to make payment. TCTA does not have a balance sheet, as all assets are held on the DWS balance sheet.

The funding system used by TCTA is completely cost-reflective, to the extent that if volumes decrease, the average price of water will be increased to make up the revenue shortfall. As prices are set mechanistically, in terms of contract provisions, it will not be possible to make existing TCTA contracts subject to independent price regulation without breaching these commercial contracts, and destabilizing the availability of private funds for future water sector investments. No such regulatory power is thus envisaged.

The TCTA has been a successful means of leveraging private investment in the water sector, and is widely regarded as one of the more technically and financially efficient components of the raw water sector. Moving forward, DWS plans to leverage this expertise by rolling the TCTA into a new state owned entity, the National Water Resources Infrastructure Agency (NWRIA). The DWS will then transfer ownership of existing raw water infrastructure to the NWRIA, and by doing so create an agency with a substantial balance sheet, which will then be able to independently raise funds from the private sector to fund future investments.

The current ring-fenced structure used by the TCTA results in highly variable water prices, as each project must be able to recover its own unique infrastructure costs. As many of the most cost effective dam sites have already been used, new projects often are higher cost than existing infrastructure. Because such new projects are also often intended to serve communities that have previously been underserved, the net result tends to entrench existing inequities in water services provision. Old cheap dams tend to serve mostly historically white communities, while new expensive dams tend to serve mostly black communities. The intention is thus that the NWRIA will be able to fund multiple projects off a single balance sheet, while averaging costs and prices between projects, and by doing so improve the equity with which water services are provided to South African communities.

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<sup>38</sup> DWAF (2007: 27)

#### 4.1.2 Pricing, investment and efficiency outcomes

As already discussed in section 2, hydrological conditions in South Africa are such that water storage infrastructure is essential to ensure that water supply can be sustained during the year. From the point of view of the rest of the economy, the primary task of the raw water sector is ensuring that water storage facilities remain sufficient to supply total water demand.

From this perspective, there are worrying signs that the raw water system is not in fact meeting its fundamental imperative. For example, DWS notes that “[m]ore than 50% of South Africa’s wetlands have been lost, and of those that remain, 33% are in poor ecological condition.”<sup>39</sup> In 2010, an estimate by McKinsey suggested that, at current trends, the supply shortfall in water would be around 2,7 and 3,8 billion m<sup>3</sup> per annum by 2030, which is equivalent to 17% of surface and ground water.<sup>40</sup> Eberhard (2021 – draft: 4) estimates that in major metropolitan areas, approximately 40% of the South African population and 60% of economic activity is now at a high to moderate water supply risk due to shortfalls in the raw water supply system (see table below).

Table 2: Water resources situation in metropolitan areas

	People (million)	Water supply system	Water security risk	Status of next major supply intervention (DWS)
Johannesburg, Ekurhuleni and Tshwane	13,5	Upper Vaal & LHWP	High	Lesotho Highlands Water Project Phase 2, delayed, now due 2027
Cape Town	4,5	Western Cape	High	Berg River augmentation, delayed, now due 2024
eThekweni	3,2	Mgeni	High	Dam on the Mkhomazi River, delayed, now due 2030
Nelson Mandela Bay	1,2	Algoa & Sundays	High	Nooitgedacht system expansion delayed, now due September 2021
Mangaung	0,8	Caledon	High	A pipeline from the Orange river has been proposed with high capital and operating costs. Low cost alternatives exist (no date)
Buffalo City	0,8	Amatola	Moderate	None
<b>Total</b>	<b>24</b>	<b>40% of South African population and over 60% of GDP</b>		

Note: high water security risk where demand exceeds assured supply at a 98% level of assurance (currently, or within the next five years).

Source: Eberhard (2021 - Draft, 4), reproduced with permission.

At a pricing level, despite the acknowledgement by the 2007 pricing strategy that low prices could lead to underinvestment, there is evidence that this is exactly what is happening. Table 3 below shows the revenue implications of the most recent raw water pricing strategy. As can be seen, on a full cost basis, revenues of just under R6,5 billion would need to be raised in the 2022/23 financial year to fund operations and maintenance, as well as required capital expenditure. In practice, the implications of the pricing strategy and the price caps introduced by the 2007 pricing strategy (as

<sup>39</sup> DWS (2018(a): 2)

<sup>40</sup> Boccaletti et al. (2010)

discussed above), mean that only R4,7bn is likely to be raised in revenue. While the operations and maintenance budget will be kept at the same level as it would in a full cost recovery system, the capital expenditure budget will as a result fall dramatically, from R4,4 billion to only R2,6 billion.

Table 3: Projected Revenue: Raw Water Infrastructure Charges (rand millions)

<b>Projected revenue</b>	<b>Operations and maintenance</b>	<b>Depreciation</b>	<b>Return on assets</b>	<b>Total</b>	<b>Operations &amp; maintenance budget input: 2022/23</b>	<b>Capital expenditure</b>
Full cost	2 211	722	3 536	6 470	2 091	4 379
Pricing strategy	2 199	638	1 949	4 786	2 091	2 695
10% capping	2 173	606	1 921	4 700	2 091	2 609

Source: DWS (2021: 26)

Much of this projected revenue shortfall is associated with the pricing of water for agricultural uses. There is a long history of price concessions for the agricultural sector, with government policy in the 1980s, for example, explicitly deciding to base agricultural water prices on affordability rather than the costs of provision.<sup>41</sup> These price concessions at present are essentially unfunded. The issues in agricultural water use have been summarized in the National Water and Sanitation Master Plan as follows:

Agricultural consumption is largely unmetered, and there are concerns about unauthorised abstraction and water wastage in the sector. In addition, agricultural users pay a much lower tariff than other users of untreated water and the relatively cheap water has not incentivised the adoption of water efficient irrigation practices.<sup>42</sup>

As agricultural consumption makes up around half of water use, below cost pricing for agricultural water users has substantially affected financial sustainability in raw water as a whole. While the 2007 pricing strategy committed to setting cost-reflective prices, it also established a phased in approach coupled with price caps which in practice, have resulted in a protracted delay in the introduction of cost-based pricing in agriculture. A decision needs to be made as to how to address this funding shortfall, either by increasing agricultural prices or by providing a state funded subsidy for water prices in the sector.

In addition to the shortfalls in cost recovery in raw water for agriculture, however, the raw water sector also faces a major issue with non-payment of water charges. Table 4 below shows the outstanding debt for raw water customers as at July 2021. At that point, the total outstanding debt was roughly 4.5 times the anticipated revenue for the 2022/23 financial year, at R21 billion. The bulk of this debt was owed to water resource management and development agencies (primarily DWS) by other parts of government, with water boards and local municipalities comprising more than 60% of the total.

<sup>41</sup> Vawda et al. (2011: 186)

<sup>42</sup> DWS (2018(a): 10)

Table 4: Outstanding debt as at 31 July 2021, raw water system

<b>Water use categories</b>	<b>Outstanding Debt (R'000)</b>	<b>% of total</b>
Bulk Payers	199	0,001%
Company	2 815 276	13,3%
Dist Municipalities	2 000 099	9,4%
Individual	899 973	4,2%
Irrigation Boards	436 737	2,1%
Local Municipalities	5 580 594	26,3%
Metro Municipalities	240 012	1,1%
National Government	278 438	1,3%
Provincial Government	19 216	0,1%
Water boards	7 231 668	34,1%
Water Service Provider	322 955	1,5%
Water User Association	1 377 759	6,5%
<b>Grand Total</b>	<b>21 202 924</b>	

Source: DWS (2021: 5).

The net result of the pricing strategy and the payment issues in the water resource management and development sub-sector is that there is a substantial and growing shortfall in the available funds for development of raw water infrastructure. The South African Institution of Civil Engineering (SAICE) notes that “In general, the major water resources infrastructure is not only ageing, but there has been further deterioration as a result of insufficient maintenance and inadequate ongoing capital renewal.”<sup>43</sup> It attributes much of the problems in the sector as associated with the availability of funding, as follows:

Implementation of new water resources infrastructure development is typically between 40% and 60% of targets, due largely to the difficulties which one or other party is having in securing funding.<sup>44</sup>

However, in addition to funding issues, SAICE also suggests that “it is important to recognise that it is also a crisis caused essentially by poor management at both national and local level – poor planning, unnecessary delays in implementation and a concerning decline in institutional competence.”<sup>45</sup> These concerns with the quality and management of raw water institutions are widespread,<sup>46</sup> and problems with management and planning of raw water have arguably been associated with at least one major crisis in water supply in recent years.<sup>47</sup> This suggests that the efficiency of the sector is also of concern.

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<sup>43</sup> SAICE (2017: 20)

<sup>44</sup> SAICE (2017: 20)

<sup>45</sup> SAICE (2017: 20)

<sup>46</sup> Muller (2019)

<sup>47</sup> Muller (2017)

### 4.1.3 Problem diagnosis and case for regulation

The raw water sector is affected by a number of external factors, and care needs to be taken not to over-simplify the problems it faces. For example, the shortfall in infrastructure investment would not be as substantial if the proportion of non-revenue water in municipalities could be reduced from its current level of approximately 41%.<sup>48</sup> Similarly, the quality of raw water is affected by failures in the wastewater management system.<sup>49</sup> However, while these external factors are important and material and need to be addressed, the core problem in the sector is an infrastructure deficit, associated with below cost pricing and funding shortfalls. These problems are most severe in the agricultural sector.

A number of factors are simultaneously affecting these sector outcomes, some of which can be addressed by the implementation of independent regulation, and some of which will need to be dealt with by different policy interventions. The two most substantial of these issues are now discussed below. A discussion of the impact of corruption in the provision of water infrastructure, which has affected all areas of water services provision, is also provided in Box 2.

#### 4.1.3.1 The DWS as referee and player

A key feature of raw water provision is the number of roles the DWS plays in the sector. DWS sets the pricing strategy, implements the pricing strategy, and owns and finances most sector assets. Some oversight is provided by National Treasury, for example on the finalization of the pricing strategy, and public consultation processes do provide an opportunity for stakeholders to critique the approaches taken. However, given the range of activities undertaken by DWS it is likely that internal conflicts of interest have at times affected sector performance.

Steyn (2011: 28) sets out the kind of problems that can arise when a number of functions are grouped in this way in a single government institution:

If the key governance functions of policy making, shareholding, the regulation of market entry, tariff setting, and project promotion were all housed in a single government department the minister would typically suffer from fundamental conflicts of interest which, as experience has shown, would fatally undermine performance in the sector. For instance, increasing tariffs to pay for new infrastructure might conflict with short-term political pressures and might be hard for ministers to implement, but could be critical to ensure long-term sustainable infrastructure provision. Or, if a policy department also had the role of promoting specific projects, its responsibility to make overall sector policies objectively could be compromised by its short-term objective of in delivering projects, or by influence from the most organised industry interest groups.

There is a clear case for greater separation of roles in this area. Moving infrastructure assets into a separate corporatized entity such as the NWRIA is an important first step, and will increase the professionalization of the management of these assets. A more in-depth discussion of the benefits of corporatization is provided in sections 4.3 and 4.4, and particularly in section 5.1.

It will also be useful for price setting to be moved to an independent regulatory institution. Steyn (2011: 30) points out that “Experience has shown that ministers or officials often exercise (or

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<sup>48</sup> DWS (2018(a): 10)

<sup>49</sup> DWS (2018(a): 30)

attempt to exercise) direct control over SOE operations and investments decisions, either through informal means, or by gaining the formal powers to do so. This directly undermines the arm's length separation of powers established between Government, the SOE and the regulator." While regulatory functions continue to be housed within DWS, no insulation is provided to the regulator from this kind of influence. Clear and effective monitoring of sector efficiency can be difficult for a line department to do consistently – see the Blue Drop, Green Drop example in Box 1. A sufficiently independent regulator may still struggle to discipline the infrastructure operator, but will have a better chance of improving sector transparency, including via the implementation of a more rigorous financial management and reporting system.

The current structure of the National Water Act as regards the setting of pricing strategies will also need to be addressed. The 2007 pricing strategy is very detailed as regards the details of how price regulation is to be conducted, including for example rules on how costs are to be allocated between sectors and how to determine the required return on assets. The pricing strategy should set the rules of the pricing process, but if it does so in a great deal of detail, this gives very little independence to a regulator to design the technical structure of regulation, and refine it over time as it learns from experience. It also means that regulatory implementation decisions can't be quickly amended to deal with changing circumstances. In short, a highly prescriptive pricing strategy will become inappropriate when an independent regulator is introduced, and a more principle-based strategy will then become more fit for purpose.

**Box 1: Cancelling the Blue Drop, Green Drop water services audits** [box text]

A quality certification system for municipal water was introduced by DWS in 2009, and ran until 2014. Municipalities received Blue Drop certification when they were judged compliant “with 95% of the criteria set for effective drinking water management,” and Green Drop certification was “awarded to municipalities that complied with 90% of the criteria set for wastewater management.”<sup>50</sup> The program was rolled out rapidly and widely publicized, and achieved some success in improving outcomes. The 2014 report stated that over the period 2009 to 2012, “the National Blue Drop score has improved substantially; the number of systems assessed more than doubled and the number of Blue Drop awarded increased despite the requirement for implementation of best practices.”<sup>51</sup>

However, in 2014 outcomes in both the Blue Drop and Green Drop audit reports were poor. The National Blue Drop score fell from 87.6% in 2012 to 79.64% in 2014,<sup>52</sup> and of 824 waste water treatment plants examined by Green Drop in 2014, 508 plants had deteriorating risk ratings, and the majority of plants (471) were either high or critical risk.<sup>53</sup> These results received substantial press attention, and political pressures were created. As described by Muller (2020: 27-28):

efforts to name and shame municipalities that were not complying with regulations were not appreciated. And opposition politicians made political capital of the first Green Drop report, which showed that the majority of South Africa's municipal wastewater works were dysfunctional.

As a result, political resistance to publication of the results grew. In 2013 the Green Drop release was cancelled ‘pending submission to Cabinet’. The last, abbreviated,

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<sup>50</sup> Muller (2020: 27)

<sup>51</sup> DWS (2014(a): 2)

<sup>52</sup> DWS (2014(a): 7)

<sup>53</sup> DWS (2014(b): 19)

set of reports was released in 2014. Subsequently, owing to a reported shortage of funds, no further reports have been published.<sup>54</sup>

It has become clear in the intervening years that the cancellation of these oversight programs was a mistake, and in 2020, DWS took a decision to reinstate the Blue Drop, Green Drop reports.<sup>55</sup>

#### 4.1.3.2 *The infrastructure funding shortfall: agricultural water prices*

The funding shortfall in raw water infrastructure and the below cost pricing of agricultural water are closely linked. The simplest and most direct way of addressing the issue would be to raise the price of agricultural water to cost reflective levels. However, this is also the intervention which would potentially have the largest negative impacts. Water prices in agriculture have been non-cost-reflective for decades, and thus substantial increases in water prices may be destabilizing to some, unknown proportion of farmers.

What is likely is that steps can be taken to reduce the size of the revenue shortfall associated with agricultural water prices. A range of potential interventions are possible here. For example, it may be possible to determine which agricultural sectors are most vulnerable to higher water prices, and what the net impact of cost-reflective water prices would be on agricultural output. With this level of detail, it might then be possible to raise water prices somewhat in less vulnerable sectors, and by doing so decrease the funding shortfall while minimizing the impact on agricultural output. Additional research on this topic is needed.

Secondly, steps can be taken to ensure that non-revenue use of water in agriculture is reduced. In terms of chapter 4 of the National Water Act, one of the ways in which water use is permitted is in terms of an existing lawful water use that predates the Act. Much agricultural use of water is in terms of such existing lawful uses. Such users are then required to register with the DWS, after which the amount and purpose for which they are using water must be validated, and verification of whether water usage is legal must be undertaken, both by DWS.<sup>56</sup>

This process has been slow to implement. A 2016 study of the validation and verification process in KwaZulu Natal, for example, found that the province had approximately 16 000 registered users, and an estimated 6 000 additional mostly unregistered agricultural water users.<sup>57</sup> Water use by such unregistered users is potentially a material source of non-revenue water in agriculture, and finalizing this process would help to reduce the revenue shortfall in this sector.

Even if such steps are taken to reduce the revenue shortfall in agricultural water, it may be the case that cost-reflective pricing still cannot be achieved without having a material impact on agricultural

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<sup>54</sup> Muller (2020: 27-28)

<sup>55</sup> Press release from DWS on 7 July 2021, *Water and Sanitation reinstates the Blue and Green Drop programmes*. Accessed on 20 November 2021 at <https://www.gov.za/speeches/water-and-sanitation-reinstates-blue-and-green-drop-programmes-7-jul-2021-0000>

<sup>56</sup> Department of Water Affairs. No date. A guide to verification of water use. Accessed on 27 October at <https://www.dws.gov.za/WAR/documents/VerificationGuideDec06.pdf>

<sup>57</sup> Kapangaziwiri et al. (2017)



output. If this is the case, then a policy decision will need to be made as to whether or not to explicitly subsidise agricultural water prices.

Few of the interventions outlined above can be undertaken by an independent sector regulator. They instead are associated with the licencing functions performed by DWS, and the fiscal and policy framework of the water sector, which is the responsibility of DWS and National Treasury. An independent water regulator could potentially be involved in undertaking a more rigorous technical engagement with the sector to find areas where agricultural water prices could be made more cost reflective without damaging sector economic outcomes materially. Doing so could then materially improve the current infrastructure funding shortfall.

#### **Box 2: Corruption in water infrastructure**

One of the difficulties in assessing whether independent economic regulation would help improve outcomes in the water sector is that in many areas the problems experienced are at least partly associated with corruption. While an independent economic regulator would help to improve governance in the sector as a whole, and would provide another layer of oversight as regards whether spending is sensible and justifiable, ultimately these problems are usually not resolvable without intervention by the criminal justice system.

Muller (2020: 18) suggests that the peak point of corruption at DWS was the tenure of Minister Nomvula Mokonyane from 2014 to 2018. Substantial damage was done to both the financial status of the water sector and its efficiency during this time in particular, and the problem affected all levels of the water cycle. Muller (2020:47) identifies three specific strategies that were used, as follows:

- Manipulation of procurement and operational processes, to subvert the anti-corruption controls already built into the procurement system
- Influencing the policy and regulatory framework, in part by ensuring that officials who will tolerate or facilitate corruption are put into key policy positions
- Taking control of institutions by putting compliant individuals in leadership and technical roles

The after effects of this kind of systemic corruption affects many of the metrics which economic regulation targets in insidious ways. For example, corrupt procurement processes result in overspending on infrastructure that would then result in unacceptable increases in tariff levels, if cost-recovery tariff setting is implemented. If the central motivation for procurement decisions is corruption, it is also likely that the assets procured will be poorly designed, and that inadequate provision will be made for operating expenditures (the Giyani water project, involving a regional bulk infrastructure grant administered by DWS, is arguably a good example of some of these problems).<sup>58</sup> If the assets involved have long operational lifespans, the regulatory problem may be ongoing over this operational lifespan.

One of the most pernicious effects of corruption is its impact on managerial efficiency. Again, if the central motivation of management is corruption, efficiency levels will slip. Staff may be hired based on malleability rather than competence, and competent, ethical staff are more likely to be fired. Urgent decisions get put off to allow time for procurement processes to be subverted – which is arguably what happened to the second phase of the Lesotho Highlands Water Project.<sup>59</sup>

## **4.2 Bulk potable water treatment and distribution**

Once raw water has been treated and is potable, it can then be supplied to end users, and to the institutions which on-sell to end users. While a number of different types of institutions are involved in the bulk potable water sector, the main institutions involved in both treating and

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<sup>58</sup> Muller (2020: 18)

<sup>59</sup> Muller (2020: 22)

supplying bulk water are water boards, of which there are currently nine in operation.<sup>60</sup> Water boards are also the only bulk water suppliers which are currently In the Water Services Act, 1997, the purpose of water boards is defined as follows:

S29. The primary activity of a water board is to provide water services to other water services institutions within its service area.

Water boards are established as a body corporate (section 31), and are governed by a board of directors (section 35). Their primary purpose revolves around the provision of bulk water, but the Act explicitly allows them to perform the following functions, and does not limit them to only these functions:

S30(2)(a) providing management services, training and other support services to water services institutions, in order to promote co-operation in the provision of water services;

(b) supplying untreated or non-potable water to end users who do not use the water for household purposes;

(c) providing catchment management services to or on behalf of the responsible authorities;

(d) with the approval of the water services authority having jurisdiction in the area—

(i) supplying water directly for industrial use;

(ii) accepting industrial effluent; and

(iii) acting as a water services provider to consumers;

(e) providing water services in a joint venture with water services authorities; and

f) performing water conservation functions.

In practice, Walsh (2013: 2) suggests that there have been a range of reasons for the establishment of different water boards. While a number were established primarily to serve as bulk water suppliers for regional systems, others were designed mainly to provide water to industrial or mining customers, some were converted into water boards from former homeland government water utilities, and some have been newly established to serve under-serviced areas. As a result the existing water boards differ substantially in terms of size, efficiency and profitability.

The water boards service some of the most densely populated areas of the country, but most of the geographical range of the country is not covered by a water board.<sup>61</sup> Entities other than water boards may thus also perform bulk potable water functions as necessary. In particular, municipal water services authorities may perform their own bulk water services, and provide those services

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<sup>60</sup> Twelve water boards went into operation after the promulgation of the Water Services Act, but the sector has since been reorganised into nine water boards.

<sup>61</sup> Walsh (2013: 3)

to other institutions.<sup>62</sup> Some private companies are also in operation in this sector, including Midvaal Water Company (which is run as a tax-free non-profit).<sup>63</sup>

Chapter VI of the Water Services Act gives water boards the ability to “set and enforce general conditions, including tariffs, for the provision of water services,” in a way which is consistent with the rest of the Act, and requires public consultation on those tariffs. It does not however otherwise regulate the manner in which tariffs are set. The Municipal Finance Management Act requires National Treasury to monitor the price structure for bulk water provision to municipalities (section 41), but does not set out how such tariffs are to be structured.

Eberhard (2004: 20) states that, while the minister approves water board tariffs through the process of approving the business plan of the water board, this is done with “no explicit criteria and little transparency,” and as a whole describes the tariff approval process as “relatively informal.” Vawda et al. (2011: 192) note that in terms of municipal financial regulations, tariffs must also be discussed and agreed with municipal customers, which does add some transparency to the process, but concede that:

Charges are generally set at a cost-plus price but there is no formal economic regulation of these prices, and no clear guidelines for the allowed costs or rate of return have been established. As a result there are limited incentives to reduce costs or improve efficiency although DWAF maintains a policy that increases should, where possible, be consistent with government inflation targets.

To reiterate, only water board tariffs are subject to this oversight. The Act requires water boards to strive to be financially viable, rather than to seek profitability. Financial viability is defined as follows:

S34(2) ...a water board is financially viable if it is able to--

- (a) repay and service its debts;
- (b) recover its capital, operational and maintenance costs;
- (c) make reasonable provision for depreciation of assets;
- (d) recover the costs associated with the repayment of capital from revenues (including subsidies) over time; and
- (e) make reasonable provision for future capital requirements and expansion.

In practice water boards typically have relatively few customers, most of which are usually municipalities. While this simplifies the process of debtor management, it also means each water board is very exposed to the financial well-being of the municipalities it serves.<sup>64</sup>

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<sup>62</sup> Eberhard (2004: 20-21)

<sup>63</sup> The ownership structure of the company is unusual. Per its website, Midvaal Water was originally established and owned by mining companies, but since then, “[t]he shares were bought back by the Company and there is no shareholding or ownership interest in the Company. Therefore, the Company owns itself and all of its resources and assets belong to it.” <https://www.midvaalwater.co.za/>, accessed 23 December 2021

<sup>64</sup> Walsh (2013: 27)

A striking feature of the Act is the extent of the powers that are granted to the Minister as regards water boards. Specific powers granted to the Minister include the following:

- The ability to appoint all board members, with relatively few administrative constraints on how this is accomplished (s35(1))
- The ability to terminate the appointment of any or all members of the board, with no constraint as to the cause of the termination, and limited procedural requirements (s35(5))<sup>65</sup>
- Discretion to set the remuneration of non-executive board members (s35(6)), and to approve the remuneration of the chief executive (s36(2))
- The ability to direct a water board to amend its business plan (s40(6))
- The power to issue a directive to a water board to undertake an activity at its own cost, or to desist from an activity it is undertaking (s41)

#### 4.2.1 Pricing, investment and efficiency outcomes

As has already been noted, the price regulation imposed on water boards is fairly light at present. While these institutions are not required to be profit-seeking, in practice many make healthy returns. Table 5 below shows the relative size and financial performance of nine water boards – illustrating that Rand Water is the largest operational water board by a substantial margin. As can be seen, in 2018/19 all water boards shown collected revenues in excess of total expenditures, and in some cases well in excess.

Table 5: Water board financial performance and average tariffs, 2018/19

	<b>Bulk water tariffs (R/kl)</b>	<b>Total expenditure (R'000)</b>	<b>Total revenue (R'000)</b>	<b>Revenue in excess of expenditure</b>
Amatola Water	11	434 915	570 037	24%
Bloem Water	8	757 552	956 824	21%
Lepelle Water	7	648 421	704 703	8%
Magalies Water	7	609 125	1 047 240	42%
Mhlathuze Water	5	620 971	711 942	13%
Overberg Water	7	50 918	56 266	10%
Rand Water	9	12 319 895	15 768 858	22%
Sedibeng Water	9	1 590 743	1 648 595	4%
Umgeni Water	7	1 932 903	3 100 661	38%
<b>Total</b>		<b>18 965 443</b>	<b>24 565 126</b>	<b>23%</b>

Source: adapted from Ngobeni (2020: 5), with permission.

<sup>65</sup> It should be noted that these powers may have been limited by a recent high court finding on the dissolution of the board of Umgeni Water by previous DWS Minister Lindiwe Sisulu. The high court set aside this decision, on the following basis:

“The termination of their appointments was unreasonable and irrational. Applicants were appointed for a 4 year term and it could never have been the intention of the legislature, nor could it be rational that the minister can at any time merely appoint or terminate the appointment of a board member at his/her whim.”

Harper, P. 23 October 2021. High court reinstates Umgeni Water board. Mail & Guardian, accessed on 29 October 2021 at <https://mg.co.za/news/2021-10-23-high-court-reinstates-umgeni-water-board/>

In some cases, profitability at the water boards has been high enough to prompt press criticism.<sup>66</sup> However, this financial performance is made less predictable by the potential for non-payment from municipal customers, which has been exacerbated by the COVID-19 pandemic and its economic effects. For example, as at May 2021, press reports suggested that Umgeni Water alone was owed R1.4 billion by eight municipalities, of which only R535 million was current debt. As at March 2021, the total owed to all water boards in South Africa was estimated at R12.6 billion,<sup>67</sup> and four water boards (Amatole Water, Bloem Water, Lepelle Northern Water and Sedibeng Water) were in a state of financial crisis.<sup>68</sup>

From an efficiency standpoint, Ngobeni and Breitenbach report that the bulk potable water distribution systems operated by the water boards are largely in good condition, and display fairly low levels of non-revenue water. Masindi and Duncker (2016: 8) attribute the good performance of the water boards to their highly skilled management, and note that “in general, infrastructure managed by water boards is in better condition than that of the municipalities”.

However, not all efficiency metrics are as complementary. As shown in the table below, a 2021 estimate of technical efficiency at water boards found that only Overberg, Rand and Umgeni water boards could be regarded as achieving technical efficiency. While average technical efficiency for all nine water boards was 49%, if these three high performing water boards are excluded, the average decreases to 23%, suggesting that efficiency could be improved by 77% at the six inefficient institutions. The authors estimate that the efficiency losses are “equivalent to wastage in expenditure of R3.7 billion by the six inefficient water boards.” The authors do however concede that some of the efficiency issues are associated with smaller water boards failing to achieve economies of scale. The extent to which economies of scale are practically achievable will vary depending on the operating conditions of each water board.

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<sup>66</sup> de Wet, P., 29 March 2018. *The controversial state company that supplies Durban with its water turned a R100 million a month profit – at the end of a drought.* Business Insider SA. Accessed on 2 November 2021 at <https://www.businessinsider.co.za/durbans-water-supplier-umgeni-water-turned-r100-million-a-month-profit-at-the-end-of-a-drought-2018-3>

<sup>67</sup> Mboti, S. 10 June 2021. *Dire warning from Umgeni Water as municipalities fail to pay for the provision of water.* Accessed on 2 November 2021 at <https://www.iol.co.za/mercury/news/dire-warning-from-umgeni-water-as-municipalities-fail-to-pay-for-the-provision-of-water-ebd83fd6-ed65-442d-a6ea-e4102bb5c2d5>

<sup>68</sup> Eberhard (2021 – Draft: 1)

Table 6: Water board technical efficiency scores

<b>Water Board</b>	<b>Estimated technical efficiency</b>
Amatola	16%
Bloem	18%
Lepelle	34%
Magalies	33%
Mhlathuze	26%
Overberg	100%
Rand	100%
Sedibeng	13%
Umgeni	100%
Mean	49%

Source: adapted from Table 4 in Ngobeni and Breitenbach (2021: 873), under license CC BY 4.0.

Efficiency in bulk water has also been affected by several notable instances of corruption involving water boards. Muller (2020) details a number of such instances, including:

- The role played by Lepelle Water Board, at the direction of the then Minister of DWS, as the implementing agent in the Giyani water project, which has been highly problematic
- The role of Rand Water in overseeing the expensive and ineffective War on Leaks trainee program, and its subsequent transfer to Mhlathuze Water
- Governance issues around the Mhlathuze–Mgeni merger

While procurement rules for water boards are designed to prevent misuse of funds, Muller points out that

...the motive for many of the interventions in water board governance and management was to gain control for irregular purposes. They also showed that, once control has been gained, formal procurement rules provide limited safeguards against misappropriation.<sup>69</sup>

As has already been mentioned, legislation provides the Minister with substantial powers over water boards. In practice, this power has at times been misused, and the water boards involved have not had the practical ability to fend off poorly designed, unfunded instructions, possibly made with corrupt intent. Muller describes the issue as follows:

The Water Services Act (s41(1)) empowers the minister responsible for the DWS to direct the water boards under their oversight to undertake a specific activity. This power was liberally exercised and is at the root of the Giyani and War on Leaks problems where the department found itself with financial commitments that had simply not been budgeted for. This arose because the minister and her senior officials ignored stipulations in the law that the directive must be ‘reasonable’ and that the water board will only pay ‘where the activity is financially viable’. In 2018, challenged by the parliamentary committee on the huge amounts

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<sup>69</sup> Muller (2020: 29)

of money owed by DWS to the Lepelle Water Board, the water board's CEO Phineas Legodi explained that

.... "when you are given a legal instruction you can only defy at your own risk because that is insubordination, so directives had to be understood within that context, as a written lawful instruction ... In good faith the board receives and implements them with the understanding that money does or will follow."

... The history of Giyani and the War on Leaks show that the minister repeatedly abused her power by issuing directives for which she had no funds available.<sup>70</sup>

#### *4.2.2 Problem diagnosis and case for independent regulation*

From a regulatory standpoint, the water boards are subject to fairly loose oversight of pricing, operating expenditure and investment decisions, which may be resulting in excess profits and inefficiency in operating conditions at some water boards. However, the picture is complicated by at least two factors:

- The risk of non-payment from municipal customers, which poses an unpredictable risk to revenue collection, and may make it appropriate for water boards to over-collect to allow them to weather any associated financial shocks which may occur
- Problems in governance systems, which both allow for excessive political interference in operations, and have at times been associated with fraud and misallocation of funds

Thus while there is a prima facie case for tightening the regulatory framework around water boards, and improving efficiency incentives, in practice the operating environment in bulk water may not be conducive to this approach at present. An operator which is highly incentivized to produce efficient outcomes is not likely to have wide enough operating margins to weather substantial problems in managing its debtor's book, or to absorb politically determined unfunded mandates.

The introduction of independent economic regulation of the water boards will thus need to be done in conjunction with reform of the governance structure of water boards, and potentially also incorporating a mechanism to deal with the financial risks associated with municipal debtors issues. As regards the governance of the water boards, the following areas require attention:

- More rigorous procedural safeguards of the appointment, remuneration and job security of senior staff at the water boards. At present the Minister has considerable discretion over the appointment and remuneration of board members. While it is appropriate for the Minister to hold water boards accountable for their actions, and give policy instructions to them, the manner in which this is done needs to be more carefully circumscribed and contain more checks and balances
- Similarly, more safeguards are needed as regards the ability of the Minister to issue directives to water boards. Specifically, safeguards are needed in the following areas:
  - The legislation must require that the financial consequences of a directive need to be thoroughly investigated and clarified, and the expected sources of funding determined. The water board must be able to interrogate these documents in a public manner, and refuse to comply if funding is inadequate. An independent

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<sup>70</sup> Muller (2020: 50)

regulator will then play an important role in scrutinizing the quality of the analysis on which the board makes its decision

- The grounds available to the Minister to issue directives must be more carefully circumscribed. For example, while wide discretion should still be available to issue directives in cases of emergency or natural disaster, for example, other types of directives should be limited to actions already approved in terms of other planning documents, and should be subject to public consultation and approval processes if not already contained in other planning documents.

### 4.3 Municipal water services

The bulk of economic activity in the water sector occurs at the retail water level, where most provision is undertaken by municipalities. As shown in the table below, bulk and raw water charges comprise only a quarter of the total retail tariff, with the remainder comprising the retail mark-up.

Table 7: Composition of water tariffs

Average tariffs	Per kilolitre	% of total tariff
CMA raw water tariff	R0,03	0,09%
Water resource infrastructure charge	R1,00	2,9%
Bulk water tariff	R8,00	22,8%
Retail water tariffs	R26,00	74,2%
Total tariff	R35,03	

Source: author's elaboration based on Ngobeni (2020: 8).

The disproportionate size of the municipal water system is confirmed when examining the relative revenues and expenditures of these institutions, as shown in the table below. On these metrics, municipalities make up around half the water sector. Municipal water assets as shown are proportionately smaller, but it is not clear whether the asset valuation methodology used is standardized across all institutions, and thus whether it is truly comparable.<sup>71</sup>

Table 8: Summary of operations of key water sector institutions, 2020/2021

Institutions	Revenue (Rm)	Expenditure (Rm)	Carrying value of assets (Rm)
DWS	17 000	17 000	2 000
Water Trading Entity	16 000	14 000	98 000
TCTA	5 000	6 000	
9 CMAs	753	753	
9 Water Boards	29 000	24 000	75 000
146 Municipalities	76 000	69 000	33 400
Total	143 753	130 753	208 400

Source: adapted from Table 2 in Ngobeni and Breitenbach (2021: 866), under license CC BY 4.0.

<sup>71</sup> There are indications that some institutions in the water sector have begun valuing assets at replacement value, while others may still be using depreciated or historical asset values. This would tend to produce highly inconsistent asset valuations.



The legislative framework for municipal water comprises the Water Services Act, the Municipal Finance Management Act No. 56 of 2003 (MFMA) and the Local Government Municipal Systems Act No. 32 of 2000. The Water Services Act defines a water services authority (WSA) as “any municipality... responsible for ensuring access to water services.” Sections 11(1) and (2) then impose a duty on WSAs to “progressively ensure efficient, affordable, economical and sustainable access to water services” to all actual or potential consumers in its jurisdiction, subject to factors which include the availability of resources.

In terms of section 19, a WSA may provide water services itself, contract a water services provider, or enter into a joint venture to provide services. Private sector water providers may only be contracted with once all known public sector providers have been considered, in line with a strong policy preference to date for public sector provision of services. Where the WSA is also acting as the water services provider (WSP), it “must manage and account separately for those functions” (s20).

Much of the framework in which municipal water services are provided is determined by the issuing of municipal bylaws, which must include at minimum:

21. (1) (a) the standard of the services;
- (b) the technical conditions of supply, including quality standards, units or standards of measurement, the verification of meters, acceptable limits of error and procedures for the arbitration of disputes relating to the measurement of water services provided;
- (c) the installation, alteration, operation, protection and inspection of water services works and consumer installations;
- (d) the determination and structure of tariffs in accordance with section 10;
- (e) the payment and collection of money due for the water services;
- (f) the circumstances under which water services may be limited or discontinued and the procedure for such limitation or discontinuation; and
- (g) the prevention of unlawful connections to water services works and the unlawful or wasteful use of water.

Section 10 of the Act allows the Minister, with the concurrence of the Minister of Finance, to “prescribe norms and standards in respect of tariffs for water services,” which may

- 10 (2) (a) differentiate on an equitable basis between—
  - (i) different users of water services;
  - (ii) different types of water services; and
  - (iii) different geographic areas, taking into account, among other factors, the socio-economic and physical attributes of each area;
- (b) place limitations on surplus or profit;
- (c) place limitations on the use of income generated by the recovery of charges; and

- (d) provide for tariffs to be used to promote or achieve water conservation.

The norms and standards document for water tariffs was gazetted in 2001, and requires water services institutions to set tariffs on a required revenue methodology, as follows:

2. Determination of revenue requirements.—A water services institution must when determining its revenue requirements on which tariffs for water services are based, take into account at least the need to—

- (a) recover the cost of water purchases;
- (b) recover overhead, operational and maintenance costs;
- (c) recover the cost of capital not financed through any grant, subsidy or donation;
- (d) provide for the replacement, refurbishment and extension of water services works; and
- (e) ensure that all households have access to basic water supply and basic sanitation.

Thus where the Water Services Act speaks only in terms of progressively ensuring access to water services, subject to available resources, the norms and standards more assertively require that access to all households must be ensured. This obligation is placed on all water services institutions, which the Act defines as including WSAs, WSPs, water boards and water services committees. The revenue requirement methodology set out endorses water tariffs being set on a cost recovery basis, but does not provide much guidance on exactly how this is to be accomplished. There is thus variation between municipalities in terms of how prices are set.

The tariff norms and standards explicitly allow for the subsidization of tariffs in order to ensure the right of access to water services is honored. This is then to be combined with volumetric tariffs to discourage wasteful use. While water services institutions are given discretion as to how to design a tariff which meets these requirements, the norms and standards also state that

(6)(2) the requirements ... are deemed to have been met where the tariff is set as a volume based charge that provides for a rising block tariff structure which includes—

- (a) three or more tariff blocks with the tariff increasing for higher consumption blocks;
- (b) a consumption level for each block defined as a volume consumed by a household during any 30 day period;
- (c) a first tariff block or lowest tariff block with a maximum consumption volume of six kilolitres and which is set at the lowest amount, including a zero amount, required to ensure the viability and sustainability of water supply services; and
- (d) a tariff for the last block or highest consumption block set at an amount that would discourage high water use and that reflects the incremental cost that would be incurred to increase the capacity of the water supply infrastructure to meet an incremental growth in demand.

The Local Government Municipal Systems Act (MSA) also provides guidance on how the tariffs for municipal services must be set. However, the MSA does not add much detail to the tariff system laid out in the Water Services Act. In terms of section 74 of the MSA, tariffs must again be volumetric in nature (“the amount individual users pay for services should generally be in proportion to their use of that service”) and the access of poor households to at least basic services must be protected through lower tariffs and subsidization. Tariffs are required to be set at a level which is consistent with financial sustainability, and reflects “the costs reasonably associated with rendering the service, including capital, operating, maintenance, administration and replacement costs, and interest charges.” Again, little detail is provided on how this is to be achieved. Finally, the LGMSA allows the tariff system to make “provision ... for the promotion of local economic development through special tariffs for categories of commercial and industrial users.” Large commercial users in a number of metros do currently receive water price discounts from municipal services providers.

Much of the monitoring of the provision of water services by municipalities takes place in terms of the MFMA. The MFMA requires municipalities to compile annual budgets (s16), “setting out realistically anticipated revenue for the budget year from each revenue source,” and distinguishing between capital and operating expenditure (s17). The form in which the budget is submitted must be prescribed by the Minister of Finance (s20). Any additional budget information requested must also be submitted to National Treasury, and to “the national departments responsible for water, sanitation, electricity and any other service as may be prescribed” (s21(2)(e)). During a consultation process on the budget, the municipality must then consider the views of “the National Treasury, the relevant provincial treasury and any provincial or national organs of state or municipalities which made submissions on the budget.” There is thus no legal right for Treasury or the DWS to enforce changes to municipal water provision systems.

While section 10(4) of the Water Services Act states that “No water services institution may use a tariff which is substantially different from any prescribed norms and standards,” the intervention mechanisms for this provision, as set out in 63 of the Act, are complex and difficult to implement. At present, it requires the Minister to request the Province to intervene in the municipality, and only allows the Minister to act directly if the Province fails to intervene effectively. The manner in which the Minister may intervene is then subject to a number of time-consuming procedural requirements,<sup>72</sup> and the ultimate end point of the intervention process is that the intervention must end “when the water services authority is in a position to resume that function effectively.” Thus while the Minister may take over the function, and assign the function to another water services institution, this cannot be done on a permanent basis. There are also no less severe enforcement provisions available in the Act, if the non-compliance issue does not merit a take over of functions.

There is very little private sector involvement in the municipal water sector. Eberhard (2021 - draft: 26) identifies the following instances of private sector involvement:

- A 1999 concession contract for a wastewater treatment facility in eThekweni
- Again in 1999, two concession contracts to manage water and sanitation in Mbombela Local Municipality and Ilembe District municipality, which continue to run to this day
- A five year contract starting in 2000 whereby a private sector company managed Johannesburg Water

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<sup>72</sup> For example, to table a notice to the National Council of Provinces and obtain their approval

Johannesburg Water is one of two examples of a municipality setting up a municipal entity structure, separate from the city administration, to run the water and sanitation system. For the first five years of its establishment, Johannesburg Water was managed by a private service provider, in terms of a management contract. The other example of a municipal entity is ERWAT, which runs the wastewater treatment facility in the Ekurhuleni metro. Aside from these two cases, and the three private concessions mentioned above, Eberhard (2021 – draft: 26) notes that “water is provided as a service embedded within the municipal administration.”

Municipal entities are governed by chapter 8A of the MSA, and chapter 10 of the MFMA. While the intent of establishing such entities is typically at least partly to ringfence the utility functions from the rest of the administrative functions of the municipality, in practice legislation still gives the municipality considerable powers as regards the functioning of municipal entities. For example the MSA gives the municipality involved discretion as regards the design of many of the governance systems of the municipal entity. Section 86H of the MSA requires the municipality to issue bylaws setting out how the directors of the municipal entity are to be appointed, replaced, and recalled, and what their terms and conditions of employment should be. The extent of functional separation from the municipality can be considerably reduced if such governance systems are not well designed.

#### *4.3.1 Pricing, investment and efficiency outcomes*

South Africa’s 278 municipalities differ substantially in size and level of complexity. The six largest municipalities are the metropolitan municipalities, which comprise Buffalo City, Cape Town, Ekurhuleni, eThekweni, Johannesburg, Mangaung, Nelson Mandela Metropolitan Municipality and Tshwane. There are also 44 district and 226 local municipalities. In practice, a great deal more data is available on the metropolitan municipalities than on the smaller municipalities, and thus much of the analysis now will concentrate on findings from these large cities. Resource constraints and management deficiencies are however often more pronounced at smaller municipalities, and thus a dataset focused on the metros will tend to overstate average municipal water performance.

The simplest measure of municipal performance is the extent to which municipalities are delivering on their constitutional obligation to provide water services to their constituents. A very high proportion of South Africans (estimated at 96%) do have access to water supply infrastructure. However, a much lower proportion – only 65% - have access to reliable water services.<sup>73</sup> There is also substantial evidence that the quality of water services, and of drinking water itself, has been declining. In 2005, 76.4% of households surveyed rated the quality of water services they received as good, but by 2016 this number had declined to 63%.<sup>74</sup> Research suggests that the quality of water provided by the metros is still high,<sup>75</sup> and that larger services providers in general have maintained better water standards.<sup>76</sup> That being said, the 2014 Blue Drop report found a general

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<sup>73</sup> DWS (2018(b): 5-3)

<sup>74</sup> DWS (2018(b): 5-2)

<sup>75</sup> Eberhard (2021 – Draft: 6)

<sup>76</sup> DWS (2014(a): 9)

decline in drinking water quality,<sup>77</sup> and a number of smaller municipalities have experienced major water quality problems.<sup>78</sup>

Problems in the supply of water services have been the focus of enormous levels of public discontent. A 2016 community survey, for example, found that when asked about the biggest challenges faced within their municipality, households were most likely to cite “the lack of safe and reliable water supply.”<sup>79</sup> Press reports leading up to the 2021 municipal elections repeatedly linked issues with municipal water systems to voter discontent.<sup>80</sup> During this research, interviews with stakeholders at municipal water service providers suggest that this political pressure affects operational decisions, and this is confirmed by other research, as follows:

... eight metro Water Managers were polled in 2017 on the significance of factors affecting service outcomes... The most important factor impeding better performance outcomes was reported to be political decisions not being made in the long-term interests of service outcomes.<sup>81</sup>

Because water services are typically provided as a part of the administration of a municipality, decision making in water services is deeply enmeshed with the political structures of the municipality. As regards water tariffs, technical staff will typically prepare a cost-based tariff proposal (the rigorousness of which is variable), and then send it to the municipal council for approval. The council is then more-or-less free to amend the tariff as it feels is desirable, and the technical staff in the water department have no recourse to debate what can be essentially arbitrary changes to the tariff, with potentially material effects on sustainability. Respondents report that the pressure to keep tariffs low is higher in election years (moratoriums on disconnecting non-paying customers in election years were also reported).

The type of services provided have also been subject to political pressure. While DWS policy has been to ensure that all citizens have access to basic services, rather than to focus on improving the quality of services, in practice “most politicians and officials aspired to deliver significantly more than a basic level of service, irrespective of cost.”<sup>82</sup> The long term impact of such infrastructure

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<sup>77</sup> DWS (2014(a): 8)

<sup>78</sup> Monama, T. 28 October, 2021. *On the road: Mahikeng, the capital city where rubbish lies uncollected and tap water is undrinkable*. News24. Accessed on 8 November 2021 at <https://www.news24.com/news24/southafrica/news/watch-on-the-road-mahikeng-the-capital-city-where-rubbish-lies-uncollected-and-tap-water-is-undrinkable-20211028>

Evans, J. 3 September 2021. *Hammanskraal residents thirsty for rapid resolution as sluggish refurbishment process deepens water crisis*. Daily Maverick. Accessed on 8 November at <https://www.dailymaverick.co.za/article/2021-09-03-hammanskraal-residents-thirsty-for-rapid-resolution-as-sluggish-refurbishment-process-deepens-water-crisis/>

<sup>79</sup> DWS (2018(b): 5-5)

<sup>80</sup> Ledwaba, L. 16 October 2021. *Local elections: Water tops the agenda in Limpopo's dry villages*. Mail & Guardian. Accessed on 8 November 2021 at <https://mg.co.za/news/2021-10-16-local-elections-water-tops-the-agenda-in-limpopos-dry-villages/>

Kretzmann, S. 21 October 2021. *Midvaal likely to remain DA stronghold although municipal sewerage pollution a major concern*. Daily Maverick. Accessed on 8 November 2021 at <https://www.dailymaverick.co.za/article/2021-10-21-midvaal-likely-to-remain-da-stronghold-although-municipal-sewerage-pollution-a-major-concern/>

Kretzmann, S. 13 October 2021. *Vereeniging brought to its knees by consistent blackouts, sanitation collapse and pollution*. Daily Maverick. Accessed on 8 November at <https://www.dailymaverick.co.za/article/2021-10-13-vereeniging-brought-to-its-knees-by-consistent-blackouts-sanitation-collapse-and-pollution/>

<sup>81</sup> Eberhard (2021 – Draft: 18)

<sup>82</sup> Eales (2011(a): 46)

investment decisions may have been to design municipal water services for which the consumer cannot ultimately afford to pay, and where ongoing operational subsidies are needed. Eales (2011: 47) summarises the municipal water services environment post 1994 as follows:

The new municipalities faced enormous pressure from their constituents, provincial and national government and the ruling party to extend service coverage, and worked hard to deliver; they provided high level services as the default in urban settlements. With government funding huge housing and infrastructure development, beneficiaries understandably wanted an in-house tap, not a yard connection or stand-pipe, and a flush toilet, not a dry toilet. Where a lower level of service was offered, residents frequently brought the project to a halt until there was a commitment from local politicians and officials to provide a higher level of service, either through sourcing additional funds and changing the output of the current project, or proceeding with the current project, with a promise to upgrade it within a defined period. Provincial housing delivery programmes provided free houses to poor families, with house taps and flush toilets as the default; in many areas new settlement development went ahead without even confirming that the municipality had the water supply or bulk infrastructure to support a large new housing development with high-level services, let alone the revenue to fund subsidized service provision.<sup>83</sup>

Eberhard (2021: 13) finds that more than half of metropolitan water businesses are currently in serious financial trouble. While political pressure at times has constrained water prices below cost-based levels, these financial troubles are not wholly attributable to political pressure on prices. In fact,

The metro municipalities have implemented above inflation increases in water tariffs over a long period of time. Average effective tariffs increased in real terms (net of inflation) by 100% in Cape Town, by about 60% in the City of Johannesburg and Tshwane and by more than 50% in Buffalo City and Nelson Mandela Bay over the period 2008 to 2019.<sup>84</sup>

Despite this price growth, however, municipal water revenue remains insufficient to cover the operating costs and asset investments needed.<sup>85</sup> Two major causes of this are high levels of non-payment by municipal customers, and of non-revenue water as a whole. Eberhard (2021 – draft: 7) suggests that an acceptable benchmark for non-revenue water (NRW) is 25%. The metropolitan municipalities instead average 42%, and all of them exceed the benchmark. The total cost to municipalities of this excess NRW is estimated to be in the region of R9.9 billion.<sup>86</sup>

NRW includes water that is billed but unpaid for. Such losses due to non-payment are substantial. Eberhard (2021 - draft: 16) suggests that the acceptable benchmark for revenue collection in municipalities is 95%. As shown in Table 9 below, none of the six metros which report this data meet the benchmark, and three of them collect less than half of revenue owed. While affordability issues are likely still a leading cause for non-payment, in some areas it seems likely that there is a culture of non-payment for services. There have also been delays in rolling out cadastral surveys

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<sup>83</sup> Eales (2011(a): 47)

<sup>84</sup> Eberhard (2021 – Draft: 15)

<sup>85</sup> Eberhard (2021 – Draft: 36)

<sup>86</sup> DWS (2018(a): 10)

in areas which were previously designated as black homelands. It is difficult to collect on an account the location of which is not precisely identifiable.

Table 9: Revenue collection efficiency for water (2020/1)

<b>Metropolitan area</b>	<b>Collection %</b>
<b>Benchmark</b>	<b>95%</b>
Cape Town	89%
Johannesburg	79%
eThekwini	72%
Mangaung	46%
Buffalo City	46%
Nelson Mandela Bay	45%
Tshwane	Not reported
Ekurhuleni	Not reported

Source: Eberhard (2021 – Draft: 16), reproduced with permission.

There are multiple factors driving non-revenue water. Some proportion of NRW is authorized unbilled consumption, for example by customers who are paying a flat rate for their connection and using excessive volumes of water. Illegal connections are also a material issue in some municipalities. A key contributor to high levels of NRW however is water leaks, associated with insufficient maintenance of physical infrastructure. The operational lifespan of water pipes typically ranges from 50 to 100 years, and thus to maintain pipe infrastructure, between 1 and 2% of pipes need to be replaced annually. Only one of the eight metros meets the lower end of this benchmark, as shown in the table below. Very low levels of pipe replacement are associated with a degradation of the quality of infrastructure, and an increase in leakages.

Table 10: Risk of supply interruptions, metropolitan areas

<b>Metropolitan area</b>	<b>Water mains bursts / 100km pa</b>	<b>Rate of pipe replacement (%)</b>	<b>Risk of increasing supply interruptions</b>
<b>Benchmark</b>	<b>30</b>	<b>2</b>	
Ekurhuleni	612	0.1	Very high
Nelson Mandela Bay	55	0.1	Very high
Tshwane	589	0.2	Very high
Buffalo City	20	0.2	Very high
Cape Town	28	0.3	High
Mangaung	Not reported	0.4	High
Johannesburg	350	0.5	High
eThekwini	Not reported	1.0	Moderate

Note: Rate of pipe replacement shown as percentage of network length replaced per year (average for the last four or five years).

Source: Eberhard (2021 – Draft: 7), reproduced with permission.

It should also be noted that revenue from the sale of water is not ring-fenced for use in providing water services. Should a municipal WSP thus be successful in raising sufficient revenue to fund the provision of water services, there would thus be no guarantee that these funds would in fact

be made available to the WSP. Revenue from the sale of municipal services like water, sanitation and electricity can and is used to fund other municipal services, for example road maintenance.

As a whole, the metropolitan municipalities have been underspending on their water and sanitation infrastructure for at least ten years, and as a result a massive infrastructure backlog has developed.<sup>87</sup> As at 2014, the Blue Drop report found that 48% of plants were running at 75% or more of design capacity, and that the performance of 90% of reporting systems as regards operation and maintenance budget and expenditure was rated “critical.”<sup>88</sup> Insufficient revenue collection, as has been noted, is part of what is driving this underinvestment. However, it can also be observed that many metros are failing to spend their available capital budgets.<sup>89</sup> National Treasury’s Municipal Money website suggests that, as regards capital budget spending, “[p]ersistent underspending may be due to underresourced municipalities which cannot manage large projects on time.”<sup>90</sup> The benchmark proposed for capital budget spending is 95%, but the average for the metros is around 82%.

Part of the resourcing problem which contributes to capital budget underspending is likely to be a human resources issue. Table 11 below shows the human resources situation in water services in reporting metros. As can be seen, in many metros the number of engineering staff is extremely low, and vacancy rates are high. Insufficient staffing affects the ability of metros to design new infrastructure solutions, and maintain existing assets in good condition.

Table 11: Human resources overview, metropolitan water services

<b>Metropolitan area</b>	<b># of Staff <sup>1</sup></b>	<b># of Vacancies <sup>2</sup></b>	<b>% Vacancies <sup>3</sup></b>	<b>Registered Professional Engineers</b>	<b>Registered Technologists &amp; Technicians</b>
Cape Town	4 110	907	22%	42	--
Johannesburg	2 716	--	--		37
Ekurhuleni	962	197	20%		1
Nelson Mandela Bay	800	--	--	0	9
Buffalo City	653	122	19%	1	9
Mangaung	623	624 <sup>4</sup>	100%	1	2
Tshwane	--	--	--	7	--
eThekweni	--	--	--	--	--

Notes: 1. Current staff in water and sanitation department (filled positions). Note that the scope of functions differs between municipalities. 2. Based on funded posts. 3. Percentage of filled positions. 4. Includes unfunded posts.

Source: Eberhard (2021 – Draft: 18), reproduced with permission.

Last but not least, municipal water services have experienced significant levels of corruption in procurement. Muller (2020) details a number of examples of this, including the provincial government takeover of municipal budgets in Mpumalanga, abusive behavior by water tankers in

<sup>87</sup> Eberhard (2021 – Draft: 10)

<sup>88</sup> DWS (2014(a): 27)

<sup>89</sup> Eberhard (2021 – Draft: 11)

<sup>90</sup> Municipal Money, accessed on 10 November 2021 at <https://municipalmoney.gov.za/profiles/municipality-TSH-city-of-tshwane/>



a number of municipalities, and issues with the procurement of water meters in Ekurhuleni.<sup>91</sup> Such corruption has tended to further reduce the efficiency and compromise the financial performance of municipal water services.

#### *4.3.2 Problem diagnosis and case for independent regulation*

The provision of municipal water services is characterized by a number of problems as regards pricing, investment and efficiency levels. To summarise:

- While many municipalities have been able to implement above inflation price increases over a number of years, it is not clear that pricing methodology is consistently based on the actual cost of provision, and there is considerable political pressure to keep tariffs low, even if this affects sustainability
- Even where tariff levels are cost reflective, there is no guarantee that water revenue will be spent supporting the provision of water services, because funds are not ring-fenced
- There has been systemic underinvestment in the sector for years, associated both with funding shortfalls and with insufficient capacity to manage infrastructure projects. Where investments have been made, they have at times been made with insufficient attention paid to long term cost effectiveness and the implications for wider water systems
- Insufficient managerial and engineering resources, together with the effects of political interference, are driving very low levels of efficiency, as reflected in the unacceptably high levels of non-revenue water being experienced. The effects of inefficiency are accumulating over time, as the impact on the quality of the infrastructure stock grows

It is evident that the problems faced by municipalities are complex, interlocking and often self-reinforcing. For example, bills are not collected, so money is not available to do needed maintenance, so the quality of service provided degrades, which likely reduces the willingness of customers to pay for the service. These kinds of issues will require responses at multiple levels of the municipal system to resolve. However, despite this complexity, it is nevertheless likely that an independent economic regulator could help to address at least some of the issues in municipal water.

The manner in which prices are set and budgets finalized at present appears to be excessively exposed to political influence. The problem of political interference in water services provision is not unique to South Africa, and this excerpt from Ehrhardt et al (2007: 19-20) on the international experience fairly accurately describes the current environment in South Africa:

One of the principal problems with politicians playing a directive role in regulation is that their decisions tend to lack long-term commitment to coherent tariff and service combinations. Politicians are often tempted to make decisions that are based on short-term interests. They may push for tariffs that only recover short-run operating costs, meaning that the provider has insufficient funds to maintain long-lived assets or make new investments. This may win favor from consumers in the short term (lower tariffs are generally popular), but in the long term it will be detrimental as services begin to deteriorate.

Alternatively, politicians may demand that services be improved or coverage increased without allowing a corresponding increase in tariffs. The lack of

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<sup>91</sup> Muller (2020: 35, 37, 44)

coherence between services and tariffs harms both the provider and consumers in the long term.<sup>92</sup>

Much of the contestation between technical and political interests in water services takes place during the annual formation and approval of the municipal budget. While legislation requires that municipal water tariffs should cover the costs of service provision, in practice there are insufficient safeguards in place to ensure that this is implemented. Specific points where the process fails include the following:

- **The development of municipal water tariff proposals:** while DWS and National Treasury provide oversight over tariff development processes, they do not have sufficient staff to deal with the volume of tariff proposals involved. In addition, the regulatory staff at DWS and National Treasury are not insulated from political pressures to keep tariffs low; and for National Treasury water services provision is only one among many relevant municipal metrics. The oversight framework required to ensure that tariff methodologies are truly cost-reflective is thus insufficient.
- **The approval process for water tariffs:** municipal water tariffs form part of the municipal budgeting process, which in terms of the MFMA must be approved by the municipal council. The council has considerable discretion to amend the tariff proposal as desired, and there is little or no recourse for the water service manager at the municipality to contest the effects of such amendments
- **The use of water revenues:** without ring-fencing of water revenues, there is no guarantee that cost reflective water tariffs will result in sustainable provision of water services
- **The design and maintenance of water services assets:** municipalities which do not have enough experienced technical staff will struggle to choose appropriate design parameters for new water assets, and to set up and carry out realistic asset maintenance programs. Even if these tasks are adequately performed, they may then struggle to find sufficient funding to carry out these tasks.

An independent economic regulator, playing a fairly active role in the tariff formation process, could potentially help to address some of these issues. Most of the parties currently involved in the tariff setting process have political incentives to ensure that services are rolled out as widely and cheaply as possible. While these are commendable goals, it would be helpful to introduce an independent regulator to the process which is explicitly tasked with monitoring whether the cost of services is fully covered (either from revenues or from subsidies), and whether infrastructure is being managed sustainably. Such a regulator could help to introduce some countervailing power into current processes, which seem to be dominated by shorter term political imperatives that contribute to asset deterioration. There would likely be limits to what such a regulator could accomplish, however, if water revenues are not ringfenced to support water services provision.

The manner in which such regulation should be implemented will need to be carefully designed. The current legal provisions allowing national institutions to intervene in municipal water services provision will need to be redesigned, to make them less cumbersome and more effective. The sheer number of municipalities involved in water services also creates a very large regulatory task. Complementary reforms as the regards the structure of municipal water services will probably be needed as well, not least to deal with the ringfencing issue. These issues are discussed in more depth in section 5.

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<sup>92</sup> Ehrhardt, et al. (2007: 19-20)

#### 4.4 Sanitation services and other wastewater

The legislative framework for sanitation services overlaps substantially with that for municipal water services. In the Water Services Act, water services are defined as including both water supply services and sanitation services. The water services authorities which provide retail water are thus also tasked with providing sanitation services,<sup>93</sup> sanitation tariffs are also covered by the 2001 tariff norms and standards, and the provision of sanitation services is governed by municipal bylaws. In addition, the National Water Act provides for the prevention of pollution of water resources (section 19), gives the Minister the ability to prescribe regulations as relate to waste treatment and management standards (section 26), and allows waste discharge tariffs to be developed as part of the water use tariff system (section 56).<sup>94</sup>

Some of the best information on wastewater and sanitation services is contained in the series of Green Drop reports released by DWS. In the first 22 pages of the 2014 Green Drop assessment, which was released publicly, the sector was described as including the following institutions:

- 152 municipalities, running 824 collector and treatment facilities, with a design capacity of 6509,7 Ml/day
- 5 privately owned institutions with total capacity of 106.7 Ml/day
- 13 Department of Environment systems, based in the Kruger National Park with total capacity of 1.29 Ml/day<sup>95</sup>
- 121 Department of Public Works waste treatment systems

The volume of the Department of Public Works systems is not disclosed. As reported by DWS in 2013,

The exact status of the treatment plants design and operational flows are largely uncertain, as ninety two (92) of the 121 plants have unknown design capacities and seventy six of the 121 plants are not measuring the flows into the plants at the frequency required.<sup>96</sup>

However, despite this gap in the data, the sheer number of municipal facilities suggest that this is where the bulk of activity in the sector occurs. As shown in the figure below, waste water management is one of the smaller sources of services revenue for municipalities nationally, comprising only 10% of operating revenue for services in the 2018/19 year.

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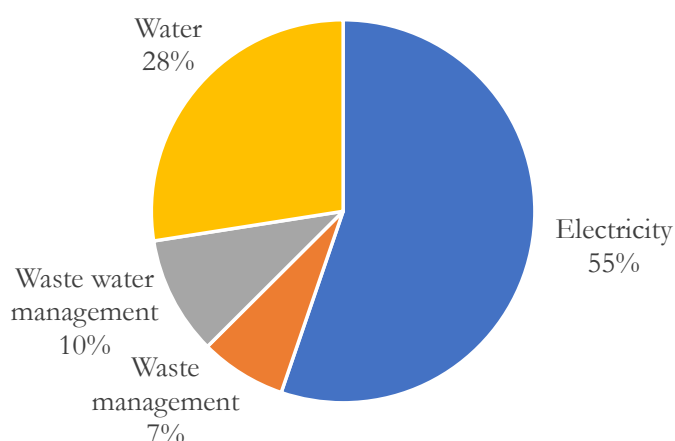
<sup>93</sup> While the bulk of sanitation services are provided by municipalities, other institutions bear the responsibility for provision of sanitation services in certain subsectors. For example, sanitation at public institutions like hospitals and prisons is the responsibility of provincial and national government, while sanitation at schools is the responsibility of the Department of Education (DWS 2018(b): 5-12).

<sup>94</sup> As at 2011, such waste discharge tariffs had yet to be implemented, “partly due to concerns about the capacity of DWAF [DWS] to introduce and administer it” (Vawda et al. 2011: 198)

<sup>95</sup> DWS (2013(b): 18)

<sup>96</sup> DWS (2013(a))

Figure 4: National municipal operating revenue for services, by source, 2018/19 financial year



Source: data supplied by National Treasury, own extrapolation.

Typically, the task of these facilities is to reduce the level of waterborne pollutants in wastewater to a level where it is acceptable to release it back into the environment. Wastewater management practices thus have a direct impact on the quality of natural water resources, which impacts on other water services institutions which use the same water source, as well as the environment more generally, and other uses, such as recreation.

#### 4.4.1 Pricing, investment and efficiency outcomes

Rolling out access to sanitation services has been a priority of the South African government, and substantial gains have been made since 1994. For example, by 2009, improved sanitation facilities had been provided to 10.9 million people, and flush toilets had been provided to just under 9 million more people.<sup>97</sup> These successes in rolling out services substantially increased the volume of wastewater needing to be processed by municipalities (as well as increasing demand for retail water).

However, substantial sanitation backlogs remain in place. For the period 2014/15, Statistics SA<sup>98</sup> estimates that approximately 64% of households had access to a flush toilet, with over 30% of households continuing to use pit latrines, and 1.3% of households still using a bucket system. Both bucket toilets and pit latrines are the focus of considerable public discontent, for understandable reasons.<sup>99</sup>

As sanitation services continue to be rolled out, the volume of wastewater which needs to be treated will continue to grow. However, the performance of wastewater treatment plants, as measured by the success with which they extract pollutants from the water they release, is already poor. DWS runs a dashboard tracking the performance of each plant, against microbiological, chemical, physical and operational risks to effluent quality. Figure 5 below is a screenshot of this

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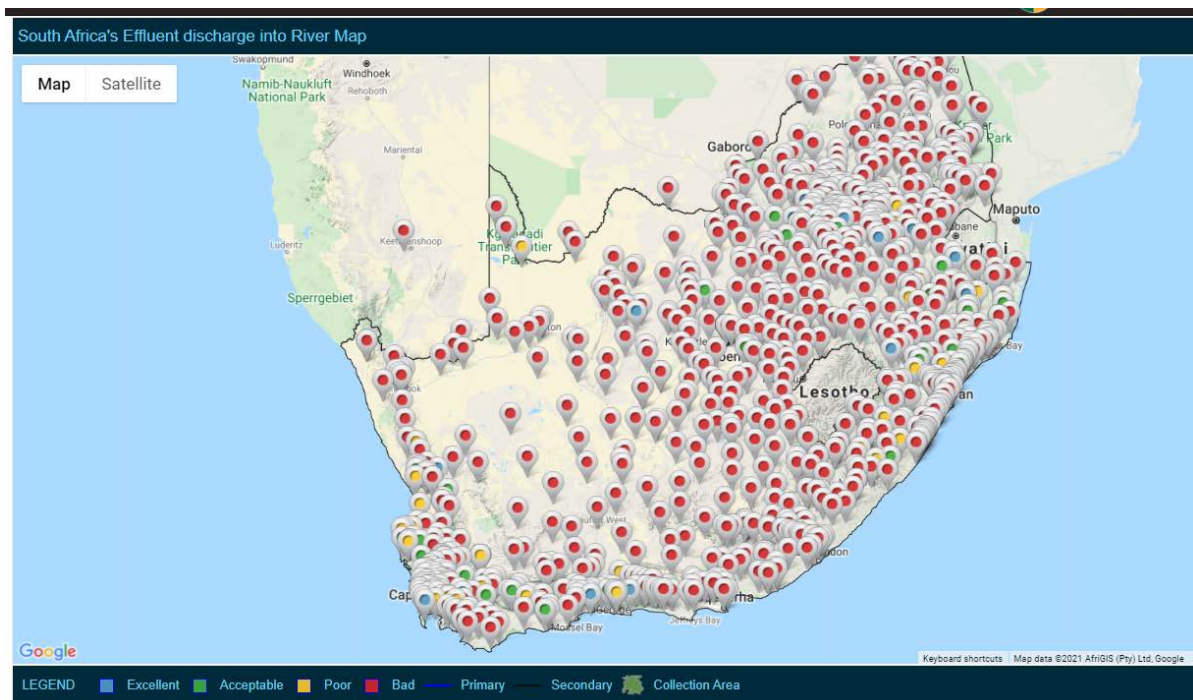
<sup>97</sup> Eales (2011(b): 74)

<sup>98</sup> Statistics SA (2017: 197)

<sup>99</sup> Nozizwe, N. 7 September 2021. *5-year-old found dead in a pit latrine toilet*. The Mercury. Accessed on 15 November 2021 at <https://www.iol.co.za/mercury/news/5-year-old-found-dead-in-a-pit-latraine-toilet-20ce1e0a-d395-4d21-9ac9-45c1ce1f1743>

dashboard as at 15 November 2021. As can be seen, the majority of plant performance is rated as bad.

Figure 5: Quality of effluent discharge into South African rivers by wastewater treatment plant



Source: screenshot of the DWS Integrated Regulatory Information system (IRIS), accessed on 15 November 2021 at <http://ws.dwa.gov.za/IRIS/myriver.aspx?c2VvcD0xJnNob3dfYWxsPTE=>.

This is consistent with the Green Drop findings for 2014. At that time 212 municipal plants (26% of the total) were assessed as at critical risk, 259 (31%) at high risk, and only 135 (16%) at low risk. Furthermore, over the period 2008 to 2014, the 2014 Green Drop report showed significant declines in performance indicators such as plant Average Capacity Exceedance Rating, Average Effluent Failure Rating and Average Technical Skills Rating.<sup>100</sup> 119 of 144 WSAs achieved less than 80% compliance.<sup>101</sup> The technical skills deficit at municipal wastewater treatment plants is a severe issue, of long standing. For example, a 2006 survey of 5 representative municipal plants, found that “56% of the plants lacked the skilled staff to maintain the installed mechanical/electrical equipment and instrument adequately, while 50% were understaffed and needed additional skilled operators.”<sup>102</sup>

Eberhard (2021) provides more detail on the performance of the metropolitan municipalities, as shown in the table below. As shown below, only one achieves compliance with benchmark performance levels, and interestingly that is the only one which is run as a municipal entity, namely ERWAT in Ekurhuleni. As can be seen the causes of underperformance are diverse, but include staff shortages, backlogs in maintenance and works operating over capacity.

<sup>100</sup> DWS (2014(b): 17)

<sup>101</sup> DWS (2018(b): 5-12)

<sup>102</sup> Eales (2011(b): 79)

Table 12: Wastewater treatment performance

	<b>Compliance</b>	<b>Status of wastewater treatment works</b>
<b>Benchmark</b>	<b>90%</b>	
Mangaung	--	7 of 8 works considered to be in a critical state. Works do not comply due to personnel shortages on the works and operational challenges, exacerbated by maintenance budget shortages and load shedding. Works have sufficient capacity except for one where flows are more than 50% over plant design capacity.
Tshwane	42%	Flows and loads exceed functional capacity for 6 of the 15 works.
NMB	71%	Works have sufficient capacity but performance is poor. 6 works in total.
eThekweni	75%	5 works require capacity upgrades, 11 works exceed authorised capacity, 12 works do not have authorisation. 26 of the 27 works require refurbishment.
Cape Town	80%	4 large works are at flow and load capacity and are being upgraded, and a further 6 works need improvement, out of 27 works in total. Treatment works experience operational challenges, particularly related to mechanical-electrical equipment.
Buffalo City	80%	4 overloaded, 4 in poor condition and 2 being upgraded out of a total of 15 works.
Johannesburg	85%	Sand ingress into sewers compromises wastewater treatment capacity and operations. Some capacity expansion is needed. 6 works in total.
Ekurhuleni (ERWAT)	90%	5 of the 19 works did not achieve required compliance levels. 11 out of the 19 works are operating above their design capacity. Data for 2018/9 (latest available annual report).

Source: Eberhard (2021 – Draft: 9), reproduced with permission.

As an example of issues in system maintenance, Eberhard also notes that, while “[g]ood practice is to clean all sewers in the network every five years as part of a routine sewer jetting programme,” in practice most of the metros do not do this.”<sup>103</sup> This is one of the causes of extremely high incidences of sewer spills, as shown in the table below. The best performing reporting metro, Ekurhuleni, exceeds the benchmark for sewer spills by a factor of six. Press coverage of the human effects of sewer spills is extensive, with some of the most egregious cases occurring in populated urban areas over extended periods of time.<sup>104</sup>

<sup>103</sup> Eberhard (2021 – Draft: 8)

<sup>104</sup> See for example Kretzmann, S.; Mtsweni, N.; Luhanga, P & Damba, N. 26 April 2021. *South Africa's rivers of sewage: More than half of S.A's treatment works are failing*. Daily Maverick, accessed on 15 November at <https://go.unu.edu/vUDxj>.

Table 13: Sewer spills, sewer pipe replacement and related risks

Metropolitan area	Sewer spills / 100km pa	Rate of pipe replacement (%)	Risk of increasing sewer spills	Risk of river pollution
<b>Benchmark</b>	<b>&lt;50</b>	<b>2%</b>		
Cape Town	1 200	0.3%	High	High
eThekweni	1 013	1%	Moderate	High
Buffalo City	1 000	--	High	High
Johannesburg	504	0.4%	High	High
NMB	462	0.1%	High	High
Tshwane	385	0.03%	High	High
Ekurhuleni	300	0.1%	High	High
Mangaung	--	--	High	High

Source: Eberhard (2021 – Draft: 8-9), reproduced with permission.

The sanitation system requires substantial infrastructure investment going forward. Eberhard (2021: 10) identifies the primary investment cost driver in the sewer network as a large rehabilitation and replacement backlog, together with expansion needs, while the cost drivers in the wastewater treatment system are also associated with a large rehabilitation backlog, together with required plant upgrades and capacity expansion. As an illustration of the size of the problem, he cites the city of Cape Town, which requires a R30 billion investment over the next ten years, which is more than twice its current level of infrastructure spending.

Some of this investment backlog stems from poor planning and underinvestment in the infrastructure associated with sanitation services, at the time that sanitation improvements were being aggressively rolled out to underserved communities. Eales (2011(b)) details the bucket eradication programme in the Free State between 2005 and 2008, during which the number of bucket toilets was decreased by more than 90%. Funding shortfalls for this programme were circumvented largely by simply foregoing spending on bulk infrastructure, as follows:

The DWAF report estimated that in the Free State, a budget of just under ZAR1.5 billion (US\$187.5 million) would be needed to implement the programme, excluding water resource development requirements (DWAF 2006). Funds allocated by government and from municipalities' own sources fell substantially short of that amount, and spending to date has been even less. Subsequent unit costs ranged from ZAR5,905 (US\$738) to ZAR32,306 (US\$4 308), but it was investment in bulk infrastructure rehabilitation and upgrading that was the main casualty of the funding shortfall. Despite evidence of effluent overflowing from both oxidation ponds and conventional works in several towns (Mafereka 2007), 110,000 buckets had been replaced with new flush toilet connections by July 2008 (DPLG 2008). Water supply shortages were remedied in at least six municipalities by using drought relief funds from government to drill new boreholes (National Treasury 2008a; De Kock 2008).<sup>105</sup>

Revenue growth trends in sanitation services suggest that sustained tariff increases in excess of inflation have been realised in recent years. For the period 2009/10 to 2018/19, when consumer

<sup>105</sup> Eales (2011(b): 82)

inflation never exceeded 7.5% per year, operating revenues in the four services provided by municipalities increased at the following average annual rate:

- Electricity: 9.5%
- Waste management: 12.9%
- Wastewater management: 14.5%
- Water: 11.6%<sup>106</sup>

This is despite the fact that many of the newly connected sanitation services users likely qualify for free basic services, or indigent services, and thus do not contribute substantially to the revenue base of municipalities. Discussions with stakeholders in municipal services suggest that in some municipalities, profitability in sanitation services is high enough to help finance revenue shortfalls in the provision of water services. However, it seems unlikely that this is universally the case.

#### *4.4.2 Problem diagnosis and case for independent regulation*

The backlog in service delivery in sanitation is if anything higher than that in retail water. Given the role that sanitation services play in both public health, and in supporting basic human dignity, there has unsurprisingly been a concerted effort by government to roll out these services as rapidly as possible. However, as pointed out by Eales (2011(b): 78), “[w]ith hindsight, it is evident that government underestimated the intensive resource and skills requirements of conventional reticulated systems.” The substantial roll-out of services was accomplished in an environment of insufficient spending on system capacity and maintenance, and deterioration of technical skills sets.

Sanitation and wastewater treatment plants, when poorly maintained, impose substantial costs to downstream users of a water resource. The release of insufficiently treated effluent by a municipality can impose large externality costs on water users further downstream, but often doesn’t affect the polluting municipality itself. As such, there is probably a systemic incentive for municipalities to under-invest in these services, which suggests that careful monitoring of effluent standards will always be required, even at the best of times.

The DWS has made multiple efforts to put in place such a monitoring system. At present, the IRIS system (as discussed in Figure 5 above) requires all wastewater plants to regularly report on the standard of their effluent. From 2009 to 2014, the Green Drop regulatory project also undertook in depth analysis of the compliance of each wastewater plant with a number of technical parameters in order to evaluate the risk of operational failure.<sup>107</sup> In practice, however, these monitoring efforts have to date made little difference in arresting the decline in municipal sanitation systems’ performance.

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<sup>106</sup> Data provided by National Treasury, own extrapolation

<sup>107</sup> The Green Drop report produced a cumulative risk rating score for each plant, calculated as follows:

$$\text{“Cumulative Risk Rating (CRR) = (A x B) + C + D”}$$

where:

A = Design Capacity of plant which also represent the hydraulic loading onto the receiving water body

B = Operational flow exceeding- on- and below capacity

C = Number of non-compliance trends in terms of effluent quality as discharged to the receiving water body

D = Compliance or non-compliance i.t.o. technical skills” (DWS 2014(b): 9)



Ntombela et al (2016: 704) attribute this failure to deal with sanitation system failures at least partially to the co-operative governance system as set out by the South African Constitution, whereby organs of state must seek co-operative outcomes by “avoiding legal proceedings against one another” (section 41(1)(h)(vi)). They note that “[t]his often renders enforcement actions against WSAs rather difficult and lengthy compared to other non-compliant water users (e.g. mines, industries etc.) against which legal action can be more easily instituted.”<sup>108</sup> This difficulty in enforcing compliance could potentially be addressed by the establishment of an independent regulator, with a wider range of legal options as regards enforcement.

In addition to these enforcement issues, sanitation services are also excessively exposed to political interference, in much the same way that municipal water services are. In fact, political interference in sanitation services may be even more damaging than that in water services, precisely because failures in delivering sanitation services result in negative externalities for water users outside of the municipality itself, and thus may not have direct political consequences. These kinds of issues are less likely to be effectively addressed by economic regulation, unless enabling reforms to the governance of the sector are undertaken first. To that end, the corporatization of municipal water and sanitation services is likely to help improve outcomes in the sector. This is now discussed in more depth below.

## 5 Recommendations

### 5.1 Corporatization of municipal water services

Where economic activity is managed by the state, the manner in which such activity is organized can vary substantially. On one end of the spectrum, services can be provided from within the political administration, with technical staff reporting directly to political principals. Alternatively, a separate arms-length entity can be set up to undertake economic activities, where management are ultimately accountable to political authorities, but politicians have little or no ability to interfere in operations on a day-to-day basis. This kind of “insulating reform”<sup>109</sup> includes corporatization. Van Ginneken & Kingdom (2009: 1) define the concept of corporatization as follows:

Corporatization transforms a utility into a public organization with its own corporate identity and independent status, with a board of directors. This can be either a statutory body functioning under public law or a government owned company incorporated under company law. In both cases ownership remains public.<sup>110</sup>

During the wave of privatisations that occurred internationally in the 1990s, firms that remained under state ownership were increasingly corporatized. Shirley (1999) examines the experience of twelve countries during this period, and concludes that “[b]esides reducing state ownership, successful reformers increased competitive pressures on and harden the budget constraints of the remaining SOEs.”<sup>111</sup> Corporatization thus both insulates the firm from political pressure, and exposes it more directly to market pressures. Shirley also notes that successful corporatization will

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<sup>108</sup> Ntombela et al. (2016 704)

<sup>109</sup> Herrera and Post (2014)

<sup>110</sup> van Ginneken and Kingdom (2009: 1)

<sup>111</sup> Shirley (1999: 122)

typically require politically costly moves to be made, for example as regards the liquidation of nonviable firms.

As has already been noted, very little of the municipal provision of water services in South Africa is currently undertaken by corporatized entities. Instead, services are provided by the municipal administration itself, which is fairly unusual from an international perspective.<sup>112</sup> The municipal entity structure allowed by South African legislation does however provide a legal framework within which the corporatization of the provision of municipal services can be undertaken. Water boards are also an example of corporatized service provision, as is the planned governance model for the NWRIA.

The Water Services Act does require municipalities providing their own water services to “manage and account separately for those functions” (section 20(1)). There is thus in theory some legal framework for managerial separation of water services. In practice, however, Tissington (2011: 63) argues that such separation does not truly occur:

Indeed, it has been shown that the distinction between the WSA and the WSP in nonurban areas is largely theoretical, and in reality the distinction is generally not made or is not working in practice, with implications for regulation at the local level. According to a comprehensive report compiled by Water Dialogues-South Africa, since the regulatory strategy at the local level is based on the distinction between WSAs and WSPs, which does not hold in practice, it is flawed and most likely unworkable in its current form.<sup>113</sup>

Van Ginneken & Kingdom (2009: 1) concede that “[t]here is no perfect model for public utilities that guarantees good performance.” However, they argue that public utilities which perform well share a number of attributes, including managerial autonomy (“being independent to manage professionally without arbitrary interference by others”). This kind of managerial autonomy is unlikely to occur when services are provided from within municipal administrations, and thus service providers directly report to the municipal council. Berg (2013: 9) explains the highly politicised nature of water services provision as follows:

Water services are politically salient: cost of service (even for a well-managed natural monopoly) can be high relative to some citizens’ ability to pay. SOEs may be particularly concerned with low prices; however, politicians can make promises without backing them up with adequate government funding. Thus, excessive political involvement in utility operations is almost certain to lead to inefficiencies: excessively low tariffs that starve the utility for cash needed for maintenance and network expansion. Furthermore, political objectives for the water and sanitation sector are seldom prioritized: low tariffs, network expansion, and service quality are reasonable objectives, but they are mutually inconsistent.<sup>114</sup>

A number of authors suggest that, while corporatization does not always result in an improvement in outcomes, on average corporatized service providers seem to be more efficient at providing

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<sup>112</sup> Eberhard (2021 – Draft: 27)

<sup>113</sup> Tissington (2011: 63)

<sup>114</sup> Berg (2013: 9)

municipal services.<sup>115, 116</sup> A number of factors seem to play a role in allowing performance improvements at corporatized entities. Commentators suggest that one of the strongest impacts of corporatization is its ability to decrease the amount of political pressure experienced by the service providers' management, and by doing so create space for decision-making to be based on practical rather than political considerations.<sup>117</sup> It is also typically easier to institute performance based incentives for management at corporatized entities,<sup>118</sup> and procurement and hiring practices are likely to be less bureaucratic. For these reasons, Berg (2013: 21) suggests that “best practice supports the corporatization of the utility.” It should also be noted that corporatization will also be conducive to the introduction of true accounting separation between the rest of the municipality and its water services division, which would make it easier to evaluate the financial performance of the entity, among other things.

An important component of the success or failure of corporatized service providers is the way their governance systems are designed. In order to achieve the type of operational autonomy from political decisionmakers that can prove beneficial, it is critical that the board of such entities be insulated from undue political influence. It is particularly important that the manner in which board members are appointed, remunerated and terminated be transparent, and governed by clearly defined and objective fair criteria. Clarity as regards the mandate of the board is also required. Van Ginneken & Kingdom (2009: 1-2) suggest that it is also helpful for corporatized utilities to own the assets they manage, and that it can be useful if utilities serve/are owned by more than one municipality, as diversified ownership can help to dilute political pressure.

It is interesting to note that, while use of corporatization in South African water services provision has been limited, corporatized institutions are among some of the better performing water services providers. The degree of professionalism at the larger water boards in particular is well regarded, and a number of them sustain good levels of profitability. Conversely, as discussed in section 4.2.1 above, increasing levels of political interference at water boards have tended to be associated with a deterioration of institutional outcomes. Similarly, at municipal level Johannesburg Water and ERWAT are well regarded, and the good performance of eThekweni's water services division has been linked to a management system within the municipality that made it possible to “establish and sustain the Water and Sanitation unit as managerially ‘semi-autonomous’ within the municipal administration, which protected management and staff from outside interference in operations, and enabled accountability.”<sup>119</sup> This arrangement has been in place for over twenty years.

## **5.2 What regulatory reforms are needed?**

As is evident from the foregoing analysis, it is clear that there is a case for some form of economic regulation in many areas of the South African water sector. However, it is also clear that the problems in the sector are multifaceted, and that an independent economic regulator will not be able to address many of these issues. Conversely, if independent economic regulation is

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<sup>115</sup> Voorn et al. (2017: 821)

<sup>116</sup> van Ginneken and Kingdom (2009: 1)

<sup>117</sup> Mumssen, Saltiel, Kingdom, Sadik, and Marque (2018: 44)

<sup>118</sup> Berg (2013: 32)

<sup>119</sup> Heymans et al. (2016: 21, 25)

implemented as part of a package of reforms, it will be much more likely to catalyse sector improvements.<sup>120</sup>

The obvious complementary reform which is needed is an overhaul of the governance mechanisms for water services provision, concentrating on municipalities. International experience clearly shows that excessive political interference in water services provision leads to chronic underperformance, associated typically with high levels of non-revenue water, collections which are insufficient to cover costs, and insufficient maintenance and investment. Berg (2013: 10) notes that these “problem areas appears in study after study of developing countries,” and concludes that **“the fundamental problem is not engineering; it is the economic incentives and disincentives that accompany excessive political interference in commercial utility actions.”**<sup>121</sup> [emphasis in original]

The corporatization model is not a failsafe method for ensuring improved performance in water services provision, and the current South African legal model for corporatization in water services arguably does not yet ensure that governance systems at corporatized entities will be adequate. However, with governance improvements corporatized entities could nevertheless substantially help to reduce political interference in decision-making. This kind of corporatized entity is likely to be easier to effectively regulate as well, for a number of reasons:

- Corporatization should be associated with full accounting separation from the municipal administration. The creation of clear boundaries between the financial operations of the municipality and those of the corporate entity will enable better quality financial reporting, and improved monitoring of financial performance
- Legislative amendments need to be implemented to ensure that senior staff are consistently hired on technical rather than political grounds, and have meaningful autonomy on technical decisions. This kind of insulation from political influence will then allow managers to be more responsive to regulatory oversight
- It is easier for an independent regulator to sanction a corporatized entity than to sanction a municipal council (although effective regulatory sanctions are likely to remain a difficult question)

It is thus clear that corporatized provision of municipal water and sanitation services should be pursued. This can occur either where existing water services divisions are converted into corporate entities, or where a corporate entity is brought in as a municipal water services provider. Such third party services providers need not be private firms, and the drive for corporatization does not need to go hand in hand with an increase in use of privatized services –in fact privatization could be problematic if it occurs before a comprehensive regulatory regime is in place. This is because safeguards against excessive profit taking are required when private entities participate in the sector. What will be needed is a revision of the existing legal governance frameworks for both municipal entities and water boards, to ensure that corporatized entities are properly insulated from excessive political influence.

Water boards which act as water service providers to municipalities are one model for state owned corporatization in municipal services provision. It would also be possible for municipalities to pool resources and co-own municipal entities, which then act as service providers to multiple municipalities. This form of corporatization is potentially very attractive, as it would allow service

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<sup>120</sup> Berg (2013: 9)

<sup>121</sup> Berg (2013: 10)

providers to achieve economies of scale and use expensive technical skills more efficiently. A service provider which is owned by multiple municipalities is also more likely to be able to resist political pressure from any single council. Finally, from the point of view of the practical costs of regulation itself, it would likely be easier to regulate a smaller number of aggregated service providers, than the current environment of many very small municipal operators. The efficiency potential of water services aggregation needs further investigation, but seems likely to be extremely beneficial in South African conditions.

It should be noted that, while corporatization has substantial potential to improve outcomes in the municipal water sector, a phased approach to the introduction of corporatization would be most prudent. Corporatisation will not be a panacea, and care will need to be taken to implement it rigorously in order to achieve optimal effects. A blanket roll-out of corporatization is thus not desirable, and instead it would be more effective to begin by using this approach to deal with municipalities which are already in crisis, for example. Corporatization could thus initially be positioned as both a best practice recommendation, as well as a component of the toolset used to undertake turnarounds at municipalities who are failing to meet their constitutional obligations. Conversely, for municipalities that are functioning well, corporatization may be unnecessary. Corporatisation thus may not need to be implemented universally, and high functioning, non-corporatised municipalities should not be unnecessarily subjected to institutional disruptions, merely to enforce institutional uniformity.

As regards the form that regulation itself should take, it is possible at this point to set out broad principles as regards the structure of the regulator, the areas of the market which should be regulated, and the regulatory tools which should be used. However, in many areas additional research will be needed in order to fully unpack the implications of regulatory design decisions, and ensure that implementing legislation is appropriately formulated. These design principles are discussed below.

#### *5.2.1 Where should the regulator be based?*

Effective regulation of the water sector in South Africa will require a greater level of regulatory independence than is currently experienced. Regulatory independence has a number of components, including the following:

**Legislative mandate:** the first and most important part of regulatory independence is that the regulator should be enabled by a clear legislative mandate, where responsibility for the regulatory task is definitively assigned to the regulator. Without such a legislative mandate, the regulatory task can simply be taken away and assigned elsewhere.

**Funding:** a regulator which has no way of funding its operations cannot fulfil its legislative mandate. The total withdrawal of funds (as seen with the Blue Drop, Green Drop programs – see Box 1) is not the only way in which funding can be used to limit independence. Throttling regulatory funds below the level needed to fully implement the legislative mandate can also substantially blunt the impact of legislation. Ideally there should be a legal right for the regulator to either be allocated funds from the fiscus, or raise funds through charges, at a sufficient level to carry out its regulatory task.

**Hiring procedures:** the manner in which board members are appointed, and by whom, plays a crucial role in safeguarding independence. Board member hiring procedures ideally are included in legislation, and are process-driven, transparent and merit based. Putting the responsibility for hiring decisions in the hands of the line ministry may cause conflicts of interest, but if the procedural safeguards around hiring are rigorous, such issues may be manageable. Conversely, this

authority can be given to a separate agency, such as the Presidency or Parliament, although appointment by Parliament in particular can lead to excessive delays in appointment processes. It also needs to be clear that board members are responsible for the hiring of senior management, without political interference.

**Firing procedures:** like hiring procedures, firing procedures for board members must be process-driven and transparent. The grounds for dismissal must be limited by legislation in order to reduce the discretion of political principles to fire individuals for political reasons. The party that legislation designates to hire board members should also be ultimately responsible for firing decisions.

**Decision making autonomy:** South African law requires that it must be possible to take regulatory decisions on appeal. However, it is important that the manner in which appeals take place is transparent and process-driven. Representatives of national, provincial or municipal government should not be given authority to review regulatory decisions.

What is clear is that regulatory independence has a number of components, and that care needs to be taken when designing the legislation that implements a regulator in order to ensure that the degree of regulatory independence which has been put in place is appropriate for the regulator concerned. In practice, achieving this level of independence in water regulation will probably require that the regulatory functions at DWS be moved into a separate legal entity.

### *5.2.2 What should be regulated?*

To summarise, the case for independent economic regulation at each level of the water cycle was found to be as follows:

- **Raw water:** existing price regulation should be moved into an independent regulator to reduce conflicts of interest
- **Bulk water:** price regulation needs to be strengthened, and should ideally be located in an independent regulator to reduce conflicts of interest
- **Municipal water:** water service management and price setting processes are excessively politicised. Regulation will help to improve sector outcomes, but probably only if coupled with reforms to the governance structures of municipal water services
- **Sanitation services:** sanitation service management and price setting processes are excessively politicised. Provision of sanitation services is also characterized by negative externalities, which suggests that some form of regulation will always be needed to maintain service standards. Regulation will help to improve sector outcomes, but probably only if coupled with reforms to the governance structures of municipal sanitation services

### *5.2.3 What regulatory tools are needed?*

Ntombela et al (2016: 704) distinguish between two main types of regulatory systems in the South African water sector, as follows:

Command-and-control based mechanisms .... directive-based regulation where objectives and acceptable standards are set and subsequently applied, monitored and enforced using administrative and criminal justice instruments...

...incentive-based mechanism[s], which, in contrast to command-and-control type mechanisms, aims to facilitate compliance with regulatory objectives and standards through motivation and reward rather than direct regulation.

Command-and-control systems are more likely to be successful when the number of regulated entities is manageable, those entities are in the same sphere of government as the regulator, and where effective forms of sanctioning non-compliance are available to the regulator. These prerequisites are more likely to be met in the raw and bulk water systems, although it should be noted that even in these sectors it may be difficult to design regulatory sanctions which create the right incentives.

In municipal water and sanitation services, however, the effectiveness of command-and-control systems is likely to be low. There are simply too many institutions that need to be regulated, and the manpower needs of an enforcement system would likely be prohibitive. The fact that municipalities operate in a different sphere of government is also likely to be a hindrance.<sup>122</sup>

Incentive-based regulatory systems are much more likely to be practically implementable in the municipal space. The Blue Drop, Green Drop reports are an example of such a regulatory initiative – the only penalty applied to under-performing municipalities was a public naming and shaming. While participation in the system was voluntary, by 2014 all relevant municipalities had chosen to participate in the scheme.<sup>123</sup> The assessment process provided fairly detailed analysis of why performance at respective water and sanitation facilities was problematic, which helped to support public engagement with problematic municipalities, placed political pressure on underperformers, and provided technical guidance on how to improve performance. The extent of the political pressure generated is arguably reflected in the fact that the program was eventually cancelled.

In 2020, DWS took a decision to reinstate the Blue Drop, Green Drop reports.<sup>124</sup> This kind of “sunshine regulation” has a good track record in South Africa and internationally as regards improving the performance of water service providers,<sup>125</sup> and coupled with the corporatization reforms which have already been discussed, would likely be an effective means of improving water services provision. However, more needs to be done to bolster this regulatory framework, to prevent the type of undermining of regulation that occurred in 2014 from happening again. At a minimum, a legislative obligation to undertake and adequately fund regulatory activities is required, in line with the reforms described in section 5.2.1 above. It would also be useful to have legislated timelines for the compulsory release of Blue Drop and Green Drop reports.

It may also be advisable to reinforce the Blue Drop, Green Drop process with additional regulatory powers and functions. Further research is needed to determine whether the price regulatory functions currently undertaken by DWS could usefully be included in the same administrative entity as the Blue Drop and Green Drop reports, for example. At present Blue Drop, Green Drop is principally an engineering-based assessment of service standards, and linking this research to assessments of the financial status of the water and sanitation systems involved might be a useful

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<sup>122</sup> It should be noted that the State Law Advisor has provided DWS with an opinion as regards its authority to regulate municipalities. This opinion concludes that “the setting of the norms and standards does not violate the powers of local government to adopt a tariff policy in respect of potable water supply systems.” As has been discussed in section 4.3, however, the enforcement mechanism currently available to DWS for violations of the norms and standards is complex and difficult to implement.

<sup>123</sup> Ntombela et al. (2016: 705)

<sup>124</sup> Press release from DWS on 7 July 2021, *Water and Sanitation reinstates the Blue and Green Drop programmes*. Accessed on 20 November 2021 at <https://www.gov.za/speeches/water-and-sanitation-reinstates-blue-and-green-drop-programmes-7-jul-2021-0000>

<sup>125</sup> Mumssen, Saltiel, Kingdom, Sadik, and Marques (2018: 4)

way of increasing the impact of regulation. To reiterate, this should be “sunshine regulation,” shedding light on financial issues rather than enforcing sanctions.

Where performance in municipal water and sanitation is particularly poor, and sunshine regulation becomes insufficient to deal with the scope of the problem, alternative interventions will then be needed. For example, National Treasury may be in a position to withhold certain forms of funding from municipalities which underperform until they agree to remedial action. Further engagements will be held with National Treasury to determine what is possible in this regards.

The ultimate form of sanction for underperforming water service providers would be to be able to replace them. Eberhard (2013) has suggested that a licencing regime for water services providers would be one way to enable this. In a licensing regime, WSPs which failed to meet licencing criteria would have their licence removed, which would then require the water services authority to appoint a new provider. Eberhard further points out that “[r]egulation through operating licenses is used in many other countries including, but not limited, to Zambia, Kenya, Chile, Australia and the United Kingdom.” An alternative way of achieving the same goal is set out in Colombia’s Law 142 of 1994. This legislation states that, where municipalities fail to comply with the service standards set for municipal services, the regulator can invite a different public service company to provide the service. Further research will be needed to identify the potential of this licensing model in South African municipalities. It is likely that licensing will only be a viable reform methodology once corporatization of water services has become more widespread.

It is also important to note that economic regulation will need to be adapted to take into account the Constitutional imperative to ensure access to water, in a profoundly unequal society. While greater attention needs to be paid to ensuring the financial sustainability of water services in South Africa, this does not imply that consumers who cannot afford to pay the full cost of services should lose access. Instead, more attention needs to be paid to ensuring the efficient, targeted use of existing subsidies, and an independent economic regulator can play an important role in ensuring that this takes place.

Further research is needed on whether these kinds of regulatory tools would be suitable for South African circumstances. Consistency with both constitutional provisions and the requirements of domestic labour law, for example, would need to be ensured. There would also need to be some research into whether there is practical capacity in the state or private sector to step in and replace the municipal service provider. If the required skills sets are too scarce, then it may not be useful to have a mechanism in place which allows for the replacement of WSPs.

### **5.3 Next steps**

Once Cabinet approval is received for this high level business case, a number of immediate next steps can be identified. These can be roughly distinguished into a corporatization and regulatory implementation program of action.

#### *5.3.1 Corporatisation of water services*

Corporatisation of water services will both require legislative amendments, and comprise a technically and politically challenging task, the full implications of which will likely only be discovered during the implementation process. During the course of 2022, therefore, corporitisation test cases will be pursued at a small number of municipal water and/or sanitation departments. The selected cases will focus either on municipalities which are already in crisis, or municipalities which express an interest in the program. Implementation as these test cases will be



a proof-of-concept exercise, which will allow the development of meaningful insights which can be used to finetune an eventual wider program of implementation.

DWS will also engage with National Treasury as regards available methods for enforcing corporatization of water and sanitation services at municipalities, and obtain a legal opinion as to the constitutionality of this proposed approach. The exercise should include an investigation of the potential for aggregation of water services across municipalities, potentially with more municipal service provision by water service providers such as water boards.

Ultimately the corporatization program will also require legislative amendments, both to the Local Government Municipal Systems Act as regards the governance of municipal entities, and to the Water Services Act, as regards the governance of water boards. These revisions will probably include putting in place a minimum threshold for corporate governance standards, accounting separation and managerial autonomy for municipal entities, and improving managerial autonomy and safeguarding the professionalization of water boards. The legislative amendments will run in parallel with the test cases for corporatisation, and legislative drafting and consultations will be undertaken during 2022.

### *5.3.2 Regulatory design and implementation*

Implementing effective regulation is an ongoing process, as high-performing regulators are always learning by doing and adapting their practices as changing circumstances demand. It is thus more helpful to aim for steady progress in the improvement of regulation, rather than to focus on a single regulatory implementation “event.”

With that framework in mind, the first useful step in improving regulation of water in South Africa, which will also be the easiest to implement quickly, would be to undertake a review of the current regulatory tasks undertaken by DWS. This review should have two purposes:

- to determine whether resourcing provided to regulatory functions is adequate
- to review whether the reporting structures and level of seniority of the division is appropriate to the task concerned

These staff will eventually form the basis of the technical skills around which an independent regulator will be developed, and it is thus appropriate to invest in the development of this skills base. The head of this division must report directly to the Minister, reflecting the importance of this function and its eventual spin off into an independent regulatory institution.

Independent economic regulation, underpinned by statutory powers, is needed in this sector. This will require at minimum an amendment to the Water Services Act to implement. Legislative processes are time consuming, which is why it will be important to begin making progress in developing the technical regulatory skills at DWS, in order to continue to progress while new laws are put in place.

The socioeconomic impact assessment system (SEIAS) for South African legislation requires that extensive consultation be undertaken during the legislative design process. Such consultation helps to collect evidence, review potential impact and build buy-in for reform. The first step of legislative drafting will thus be to build a formal proposal for the legislation to implement independent regulation, and workshop and refine these proposals with sector participants. This process should then lead directly into a process of legislative drafting. The end product of the process will be a SEIAS and draft bill for submission to Cabinet, by end-2022.

Specific areas which are likely to need research attention during this process will include:

- Appropriate regulatory independence safeguards
- How best to structure corporate governance systems for corporatized water services entities, and safeguard these systems in legislation
- The parameters of “sunshine regulation” for municipalities, as opposed to more top-down regulation of raw and bulk water

Care will need to be taken to ensure that, while the legislation implementing an independent regulator does not provide it with inappropriate powers, it also does not unnecessarily constrain regulatory autonomy. An effective regulator needs to be able to adapt its methodology to suit changing circumstances, without always having to resort to legislative amendments to do so.

## 6 Conclusion

The provision of water and sanitation services in South Africa seems to currently be at an inflection point. Since 1994, the focus of the system has been on extending services to those who were previously disenfranchised, with insufficient attention being paid to ensuring that services were provided on a basis which was sustainable in the long term. The long term has now arrived, and the consequences of this policy are being experienced in the form of deteriorating infrastructure and service levels.

As noted by Berg (2013: 9) “low tariffs,<sup>126</sup> network expansion, and service quality are reasonable objectives, but they are mutually inconsistent.” To prevent further deterioration of water services provision, reforms are now needed to ensure that the incentives of water service providers at all levels of the water cycle motivate efficiency and sustainability. Economic regulation can play an important role in creating such incentives, but will need to be implemented as part of a package of reforms. The crucial reform needed to enable economic regulation is probably the corporatization of South African water services, with an improvement in the extent to which corporatized entities are protected from excessive political interference.

This program of reforms will require a number of legislative amendments. At a minimum, regulatory functions will need a legislative foundation, and work also needs to be done to improve the governance framework for water boards and municipal entities. Other parts of the reform package may not need legislative reform – for example, National Treasury may be able to require corporatization at underperforming municipalities simply by using its funding powers. The proposed package of reforms is substantial, and additional careful analysis will be needed to tease out the likely costs and benefits involved, and ensure that legislation is correctly designed.

An important component of regulatory reform will be ensuring that constitutional rights to water remain intact. Given high levels of economic inequality in South Africa, access to water by necessity needs to be underwritten by state subsidies, and a commitment to greater sustainability in water services provision should not be allowed to prevent the achievement of this primary sector goal.

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<sup>126</sup> It would be more precise, in South African circumstances, to note that low *revenue collections*, network expansion and service quality are mutually inconsistent. While water tariffs have experienced steady increases, high levels of non-revenue water have limited revenue growth.

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