



WATER RESOURCES

SA's deepening crisis

Poor management, climate dynamics as well as political interference are threatening the country's water capacity

● SA is currently facing a water crisis caused primarily by mismanagement, poor planning and a loss of institutional competence in the public sector. The crisis is worsened by a number of factors, including unnecessary delays in rolling out water infrastructure, budgetary constraints, drought and excessive wastage.

Population growth, particularly in urban areas, has placed increased pressure on the country's water resources, aggravated by the fact that the country has a low average rainfall with an uneven distribution. Droughts in the Western and Eastern Cape, coupled with critical water shortages, have highlighted the need for better management of the country's water resources as well as a more conservative approach to water consumption.

Responsibility for the country's bulk water resource infrastructure rests with the department of water & sanitation (DWS). Water supply and sanitation services are the responsibility of municipalities that are designated as water service authorities.

The Saice 2017 Infrastructure Report Card for SA gives the country a D- grading for its bulk water resources (implying it's at risk of

failure) due to insufficient maintenance. Sanitation, including waste water, receives a C- (satisfactory for now) in major urban areas but an alarming E (unfit for purpose) in all other areas.

The report highlights the fact that current water usage already exceeds the reliable yield of existing water infrastructure, and the marginal cost of future expansions is rising rapidly. "As a consequence, though SA uses less than 40% of the country's total renewable water resource, much of this is not available at the required assurance level, and thus economic and physical water scarcity is a reality."

As a water-scarce country, the reality is that unless water resources are properly managed with sufficient long-term planning strategies in place, shortages will become increasingly commonplace. A number of municipalities which have failed to implement proper long-term planning have found – to their cost – that alternatives in the form of desalination, aquifer exploration and groundwater pose their own challenges, prohibitive costs being the primary issue, particularly in relation to the first two.

In the early 1980s SA was laud-

ed for having a world-class water planning system in place but the previous minister of water & sanitation, Nomvula Mokonyane, began to undo this system, leaving her department with insufficient expertise to implement the necessary planning, says Mike Muller, adjunct professor at Wits University's School of Governance. "Had both Cape Town and Port Elizabeth paid attention to the planning systems and what the system required them to do to safeguard water supply they would not be in

the situation they are now in," says Muller.

Water reuse and desalination, he adds, are emerging as important options that will become increasingly cost-effective as surface water opportunities are exhausted or become more expensive. "For coastal cities there is no doubt that desalination can be a useful source of water – but it's expensive. Reusing waste water is much more cost-effective than desalination. Certainly, for Cape Town, groundwater is the most cost-effective option, followed by reusing waste water, with desalination a last resort," says Muller.

To restore its water stability, SA needs to ensure that it reduces consumption, treats more of its waste-water and starts once more to invest in planned water infrastructure projects. The longer it puts the latter off, the more expensive these projects will be.

SA's waste-water is also in a dire state. The DWS's own rating system for waste-water systems found that 30% of waste-water treatment works are in a critical state, with 66% of all wastewater treatment works requiring some kind of intervention.

Earlier this year a parliamentary inquiry was ordered into the department's finances after it admitted it had overspent its budget by R2bn and requested a R2.9bn overdraft from the Reserve Bank. Auditor-general Kimi Mak-



Andrew Johnstone: Ground water is a viable alternative, but needs management

wetu told parliament that the department was suffering a skills and leadership crisis coupled with deviations over the years including duplicate payments, paying excessive project management and professional fees, expenditure on projects that had not been budgeted for, deviating from tender procedures and incurring billions in irregular expenditure.

The department has blamed its financial problems on budgetary cuts coupled with the failure of municipalities and water boards to pay their bills. Towards the end of 2017 at least 30 municipalities were warned about water cuts unless they paid any outstanding invoices to provincial water boards and the department's Water Trading Entity. The Standing Committee on Public Accounts (Scopa) has called for criminal charges to be opened against the ministry under Mokonyane, arguing that it suffered a complete collapse under her leadership.

"There is little doubt that after years of mismanagement, the DWS is in a shambles and has lost most of its expertise, with the result that there is little forward planning take place," says Andrew Johnstone, MD of independent water and environmental consultancy, GCS. "The failure of many water infrastructure projects is due largely to incompetence, which is unfortunate because the country used to be renowned for its huge infrastructure schemes such as the Lesotho Highlands Water Project."

As a country, says Johnstone, SA needs to realise that demand is rapidly outstripping supply. "2025 is when demand and supply get to equilibrium – before demand exceeds supply we need a revaluation of water and its supply," he says, adding that the situation will be made worse by climate change and variable rainfall.

An expert in groundwater resources, Johnstone says groundwater is one alternative option, but it needs to be properly managed. "Unfortunately, management and infrastructure fail before the water resource fails," he says. "The sector needs more skills in the public

arena and, as a society, we need to accept that we're going to have to pay more for an increasingly scarce resource, bearing in mind how critical water security is to a functioning economy. Without water we jeopardise the agricultural sector, food security, sanitation, health, industry and manufacturing. Without water our economy grinds to a halt."

Droughts in numerous regions leading to severe water shortages have been the driving force behind a number of water projects in development. The bulk water and sanitation infrastructure budget was given a boost in 2016 when R15bn was allocated over a three-year period through the Regional Bulk Infrastructure Grant programme.

One of the cities most critically affected by drought and water shortages has been Cape Town. The city has set itself ambitious targets of producing additional water through a combination of desalination plants, groundwater extraction and water reuse. Three desalination plants are to be built in Strandfontein, Monwabisi and the V&A Waterfront.

Another significant project in the pipeline is the Western Aquaduct in KwaZulu-Natal, a bulk water pipeline delivering water from the Midmar and Springrove dams to eThekweni; and the construction of two reservoirs. Commissioned at the end of 2012, the second phase is due for completion this year.

While the Lesotho Highlands Water Project was supposed to be providing Gauteng with water from 2019, the project has suffered excessive delays with estimations that it won't be supplying water before 2025 at the very earliest.

The Organisation Undoing Tax Abuse (Outa) accused the DWS of serious maladministration of phase two of the Lesotho Highlands Water Project, alleging that Mokonyane tried to ensure her preferred service providers received a cut of the R25bn project.

However, now that a change of leadership has taken place, the go-ahead has finally been given for the

design of the dam and connecting tunnels, says Muller. "However, it will be several years before they begin actual construction. On the plus side, there is a reputable team in place managing the project."

The fact that the project is running six to eight years late, he says, is of grave concern. "If Gauteng has a drought any time before 2026, the province could be looking at a similar situation to Cape Town, despite the fact that it now has adequate reserves."

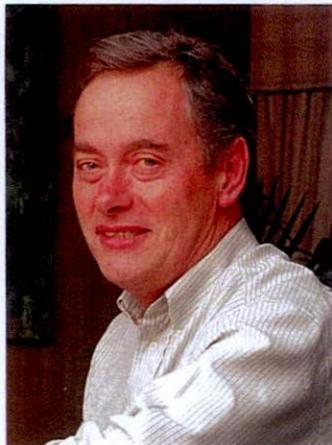
Water infrastructure financing

Large water resource infrastructure projects are difficult to finance on a stand-alone basis in the short-term despite their long-term economic benefits because demand varies with the weather, says Muller. The domestic and agricultural sectors also have limited ability to pay for the full costs of their supply, for instance. This makes it challenging for private financiers to get involved, with the result that the burden of providing – and paying – for most water infrastructure projects typically tends to fall to the public sector.

SA has had some success with the Trans-Caledon Tunnel Authority (TCTA), an organisation established in 1986 to implement the SA arm of the Lesotho Highlands Water Project. In 2000 the TCTA was transformed into a generic public project implementing agency and has, according to Muller, funded and implemented the timely and economical delivery of a number of large water projects. "The TCTA's methodologies have avoided many of the risks typically associated with large-scale water resource projects, due largely to the disciplines imposed by the financing model," says Muller.

"However, as a state-owned organisation it is subject to political uncertainties, which means its project pipeline is dependent on unpredictable mandates."

According to Muller, TCTA's experiences prove that it is possible to structure water infrastructure projects in a way that allows limited recourse funding to be raised from the private sector, thus



Mike Muller: Incompetence is affecting SA's water supply

alleviating some pressure on public finances as long as financially capable water-users are prepared to enter into long-term water supply agreements. "The secret to the success of this kind of financing model is to structure it so that it manages the risks," he says.

A number of the bigger water infrastructure schemes are still working well, says Muller, but as you get to smaller water boards and municipalities, there is a lack of maintenance and proper management.

Despite intermittent headlines claiming that acid mine drainage, particularly in Gauteng, is a huge problem, Muller says the threat acid mine drainage poses to water security in the province is exaggerated by those wishing to capitalise on it. "It constitutes just 15% of the pollution in the Vaal," he says. "Statements about the urgency of building a desalination plant to treat acid mine drainage are greatly exaggerated and will significantly raise water prices while doing little to solve long-term water supply problems."

SA needs to adopt a much more scientific and intellectual approach to water, says Johnstone. "Currently, human need and politics seem to override all else, even ecological reserves. It's a classic case of science versus politics versus the economy – an eternal struggle and one which politics is winning, to the detriment of both the economy and science." x