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Water crisis: How cities respond to

Maintaining infrastructure, fixing leaks and better information are three steps to fix the mess

Sheree Bega, Lyse Comins & Ozayr Patel

Water interruptions have reached critical levels in South Africa's major urban centres, with residents, ratepayers and businesses sounding alarms in Gauteng, Cape Town and Durban.

In Gauteng, widespread outages are linked to decaying infrastructure, rising demand and poor maintenance, with public trust in water quality sharply declining.

Durban is also battling water shortages, the result of years of poor infrastructure maintenance, which has been exacerbated by a directive to reduce water abstraction from key dams, prompting the city to impose water pressure restrictions in an effort to conserve dwindling supplies.

Cape Town, lauded for its proactive water management since narrowly averting "Day Zero", has recently experienced water cuts as a result of infrastructure maintenance.

Water interruptions in the Gauteng City-Region are "through the roof" and dissatisfaction with water services is ranking far higher, according to the Gauteng City-Region Observatory (GCRO) in its biennial Quality of Life survey.

The survey measures the quality of life and well-being of residents in every ward of Gauteng. The results will be announced next week.

"What we're seeing in the survey this time is that people have even less faith in the [water] infrastructure," said Gillian Maree, a senior researcher at GCRO.

"[P]eople don't trust the water is clean anymore even though we know our drinking water is of a very high quality ... which is probably because they don't trust the services that they are getting."

The results showed that satisfaction with water services has declined by 10%. While 82% of people thought their water was clean in 2018, this has now plunged to 60%.

"So, just over half of people think their water is clean. But I think it's because of all these water interruptions; they just don't believe that water is clean anymore," said Maree.

The survey also found that 19% of respondents reported damage or harm from water or sewage pipe bursts. Maree said this translates into one in five households, which is a "significant" figure.

Gauteng has been experiencing "frequent and widespread water outages", according to the department of water and sanitation's Platform for a Water Secure Gauteng, which was published last month.

"This is most pronounced in early summer, when water consumption increases with higher temperatures," it said, noting how there is an imbalance in supply and demand which will prevail until the completion of phase two of the Lesotho Highlands Water Project, the Polihali Dam, scheduled for 2028.

Over the past decade, there has also been underinvestment in municipal infrastructure, resulting in services decline. "There is little redundancy in the system, with no reserve supply capacity, with load-shedding, theft and vandalism all increasing the problem."

Municipal water losses (non-revenue and revenue water) "are excessive", accelerating rapid demand growth because of the population increase.

"Many individuals, households and businesses use more water than is necessary during this water shortage, and reducing consumption at all levels is necessary to bring supply and demand back into balance," according to the platform.

The platform is a collaboration between the department, Rand Water and Gauteng municipalities. Its dashboard keeps residents informed of water losses, water consumption and water leaks and outages. It has drawn criticism from various water experts for not reflecting a real-time view of reservoirs.

Maree said there are complexities in managing the city-region's water, which does not have water resources of its own to draw from. "You've got to manage the entire water chain properly, and there are failures along all of it.

"The big thing we've known for years is the lack of maintenance of our infrastructure [resulting in] all the water leaks that cities are experiencing; it's the non-revenue water and the non-payment for water, but it's also at the same time the fact that we haven't properly dealt with overuse, or the irresponsible use of water.

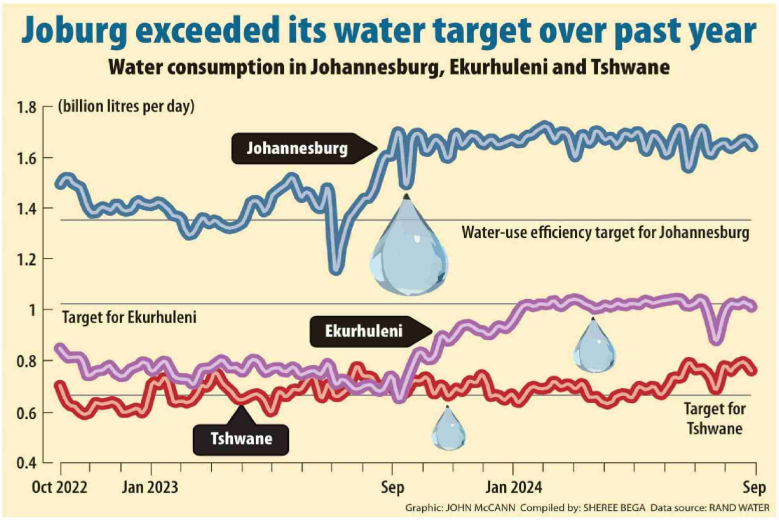
"In the past, it's always been if you can pay for it you can use it, and now we are at a point where there are so many more people who have come into the city-region, but the amount of water that we have is the amount of water that we have, so we really need to deal with it."

Language matters, too. People "need to get over this idea that using less water means a drop in your quality of life or a drop in your experience. It's not true, and we need to get to this point where we can be incredibly water efficient and still get the things that we want."

Institutional issues also need addressing, said Maree. "Are the right people talking to each other at the right times? It's not the department of water and sanitation's problem to solve — it's everybody's problem."

Communication is a major problem, said Ferrial Adam, the executive manager at WaterCAN. "The information being sent out is not good enough — just telling us that X reservoir is empty so there will be no water is not helpful. Residents want a timeline: what exactly is the problem and when will it be fixed?"

Another issue is the city manager



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wastage, unpaid bills, old pipes

and mayor are silent. "They need to be more visible on the challenges in the city," she said. Major problems are "related to the 42 leaking reservoirs and failing water pipes, so reservoirs can't fill up."

Water governance expert Carin Bosman said: "Provincial and national government are ratepayers in cities with big bills and if they don't pay, the city can't do its maintenance."

To solve the "institutional drought" hampering water provision, "we start with payment of municipal bills. We start with making sure that the cities have proper scheduled maintenance programmes in place and the money to implement them," Bosman said.

"If we don't do that, we are going to keep ending up in this situation every year in August and September until it starts raining.

"[But] even if it rains it won't solve the problem. You can have a 100% full Vaal Dam but it doesn't matter if the infrastructure to purify and bring the water to you doesn't work," she said.

In a strongly worded water supply warning on Saturday, Rand Water said storage levels throughout Gauteng have significantly declined because of excessive water withdrawals by municipalities, "raising serious concerns".

"Rand Water has repeatedly warned municipalities in Gauteng about this potential crisis. We have communicated through letters, held meetings with many municipalities, and engaged in discussions at Gauteng's Intergovernmental Governance Forum and the Gauteng Water Imbizo."

The crisis it sought to prevent had now materialised. The water supply systems in Gauteng, including Rand Water reservoirs, are critically low, and "it is essential to act now to prevent the impending disaster".

It is operating at full capacity and cannot pump additional water into the system, and the bulk water supplier had advised municipalities to reduce the physical losses of 33% identified in the No Drop report, repair leaks, enforce by-laws, and address illegal connections. "Rand Water is left with no option but to take steps to protect its system from total collapse."

Rand Water spokesperson Makenosi Maroo said it issued the alert to "conscientise and warn its municipal customers and consumers about the soaring water consumption, especially as we are heading toward the summer season".

The alert came as no surprise to Anja du Plessis, an associate professor and research specialist in integrated water resource management at Unisa.

"Unfortunately, what we have warned against specifically related to the state of our water infrastructure, as well as overall high non-revenue water, has shown to be a major issue, with numerous areas experiencing low water flow or no water at all during the first heatwave of the summer."

There is a joint responsibility, she said. "Municipalities need to decrease their response times to leaks and pipe bursts and we as consumers need to adjust our water use behaviours. If current trends continue, we might face higher water level restrictions."

That the responsible entities for water provision are pointing fingers at each other is difficult for residents to navigate, Maree added.

Troubled waters: A Rand Water team (above) carries out planned maintenance at the Bergbron water utility in Johannesburg. In KwaZulu-Natal, eThekwini metro and uMgeni-Uthukela Water utility have to deal with algae blooms (below), an indicator of excessive nutrients in water. Photos: Johannesburg Water/X and Supplied

Ekurhuleni

Zweli Dlamini, the spokesperson for the City of Ekurhuleni, said it runs joint campaigns with Rand Water and other municipalities to teach people about water conservation and the water supply problems.

"We continue to hold regular meetings with all the stakeholders to deal with this sensitive matter of water shortage because we understand what it means to the people."

Ekurhuleni has launched a "war on water leaks" aimed at responding to leaks speedily, and the maintenance of its water infrastructure programme is "progressing well", Dlamini said.

"As far as we are concerned, all stakeholders involved and/or faced with this current situation should not be pointing fingers but rather work together to deal with the situation at hand. Water is a critical need and every one of us needs it for survival."

Nombuso Shabalala, spokesperson for Johannesburg Water, said daily technical meetings were held between the utility, other Gauteng municipalities, Rand Water and representatives from the department to monitor systems and develop plans to better manage and improve water supply.

"There are also scheduled meetings on various platforms from water quality adherence to planning between these entities, which seeks to improve overall network performance. This is a team approach and the successes and shortcomings cannot be apportioned to one single entity," she said.

The utility is accelerating its water demand management (WDM) strategy, focused on repairs to leaking reservoirs, improved pressure management and smart flow controllers, among other initiatives, and while this work has started, it will "be completed in the medium term to reap the intended benefits".

"As a stop-gap measure, Johannesburg Water has intensified throttling of high-consumption reservoirs and areas, especially at night, as a means to improve reservoir capacity for the daytime as well as backlog reduction and improved response times to bursts and leaks within the network.

"Compounded to this is the fast-tracking process of removing illegal connections as part of improved credit control as well as replacing unreadable or faulty customer meters," she said, adding that it is embarking on the initiative to impose level two water restrictions, "which would be more sustainable" to reduce overall system demand.

Johannesburg Water has a dedicated team of six full-time Joburg metro police by-law enforcement teams, mostly aimed at illegal connections. "Reported repairs of leaks and bursts and backlog reduction are being fast-tracked by dedicated resources within each region to minimise losses and improve service delivery."

Shabalala said that "to get to the state where we currently find ourselves took many years. Although Johannesburg Water has and had plans to upgrade infrastructure, resources always pose a challenge. However, with the correct resources as per our various WDM strategies and infrastructure upgrade plans, we will be able to prove progress each year at a time."

The City of Tshwane said despite its numerous requests to customers to use water sparingly, its bulk water system is under severe strain and "may lead to the municipality's system running dry and eventually collapsing".

Water scientist Ayesha Laher said she is concerned that Gauteng doesn't have enough water or reinforcement.

"Cape Town did so many things [to prevent Day Zero]. There were reports on people closing their taps, they were checking what was happening, they were so proactive in what they were doing. Do you see any of that urgency in Gauteng?"

The biggest issue is "all the political drama taking place", she believed. "It's only about bloody politics. Nobody cares about what you must actually do."

eThekwini

In KwaZulu-Natal, eThekwini metro is also facing a crisis after the water and sanitation department issued a directive instructing uMngeni-uThukela Water (UUW) to reduce its abstraction from dams, which reduced the supply of water to the metro from 10 October.

According to the directive, UUW must reduce the volume of water abstracted from the uMngeni system to its licensed volumes of 470 million cubic metres a year. This will mean a reduction on the current sales and abstraction volume of 8.4%.

In response, the metro, UUW's largest customer, said last week that it will install water pressure restrictors on all water meters in the city to reduce consumption by households.

Mayor Cyril Xaba said the curtailment aimed to ensure continued water availability during periods of below-average rainfall.

"The risk of not enforcing the abstraction limit is that, should a drought occur, there would not be sufficient water in the system for uMngeni-uThukela Water to continue providing the eThekwini Municipality with a reliable water supply," he said.

According to the metro, the average consumption of water per capita is 270 to 298 litres a day, almost double the global average of 173 litres.

The metro said the curtailment is not water-shedding, which is a schedule for water cuts at certain times, but an effort to avoid water-shedding by reducing the total volume used in a controlled manner.

The metro will also reduce pressure in the reticulation network, meter all unmetered consumers, improve turnaround time in repairing leaks and burst pipes and disconnect illegal connections.

The curtailment will be implemented for 12 months.

The city said contributing factors to high water usage include rapid urbanisation, illegal connections and ageing infrastructure that results in leaks.

But Faizal Bux, the director of the Institute for Water and Wastewater Technology at Durban University of Technology, said the metro was taking the labour-intensive and costly route of installing water pressure restrictors on meters instead of using the money to fix its infrastructure and reduce its huge non-revenue water losses.

"Non-revenue water is water the municipality loses due to leaks or unbilled consumption or theft of water. For every litre of water that they're buying from UUW, more than 50% of that is lost either due to leaks, to theft or unbilled consumption," Bux said.

"Now it is a concern that you are asking the public to reduce consumption, or you want to put restrictors on their water meters," he said.

He said Xaba had recently said he would prioritise this "but the proof is in the pudding".

"In about 2009 our non-revenue water was around 32% and in 2023 it stood at 58%. We have had such a substantial increase of non-revenue water, which is completely unacceptable," Bux said.

He said the city had not maintained its water infrastructure from its reservoirs and distribution systems to its pipes leading to households.

"They have a lifespan. They have not been maintained. They're going to burst at some stage. Many parts of the city still have asbestos pipes. They needed to have a maintenance programme for replacement of our water pipes," he said.

"The consumer needs to come to the party. They need to reduce water consumption. But I think the low-hanging fruit here for the municipality is to plug the leaks," he said.

Bux said other municipalities in the province that have a smaller rates base than eThekwini would have limited resources for maintenance and were probably facing a worse situation.