

There is an answer to Cape Town's water emergency

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Day Zero is coming. It is the day in March 2018 when greater Cape Town runs out of water, when crisis becomes disaster. Scientists have a prosaic phrase to describe it: total system failure.



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To prepare for this day, Cape Town has a simple plan with three phases, to be implemented according to a supply-demand ratio. The city has been in phase one for several years, applying water restrictions and choking. In phase two, there will be rationing and in phase three, severe rationing. The plan is to progressively force a reduction in demand.

The fatal flaw is obvious. At a certain point - where the city is now - the law of diminishing returns will see the rate of consumption begin to even out. The authorities have set a consumption target of 500-million litres a day, yet consumption stubbornly remains at about 600-million litres a day. This makes Day Zero and phase three inevitable.

At phase three, the only water available in Cape Town will be drinking water supplied by tankers manned by armed troops. Essential services will be severely affected. Water will be supplied only to sustain life.

It is inevitable, too, that the city's economy will have begun to collapse. This burden, again, will be borne first and in the worst degree by the poor, but no one in the city will escape extreme hardship.

Cape Town's plan is a disaster management plan. It is appropriate, but it is not a solution - not in the short term and certainly not in the long term.

The plan is not a framework to manage an emergency. At best, it will buy the city some time. It has, as do all its plans for supply augmentation, as its basic assumption the belief that it will rain enough again to fill the Western Cape's reservoirs.

Perhaps it will rain, but acting on this hope - or failing to act - is a matter of faith.

The figures show that every year since 2014, Western Cape rainfall declined, starting each hot and dry season off a lower base and cycling through a deeper consumption trough.

The 2017 rainfall season is over and now, before the hottest and driest period has begun, the city has less water per person than it has ever had at this point in the cycle.

Cape Town has responded to early warnings, first sounded about 20 years ago, by seeking efficiency and conservation. In this time, the total volume of water consumed in the city has remained relatively constant, despite its population rising by more than a million people.

The city has also put out 24 tenders to procure what it calls supply augmentation. The augmentation plan envisages several solutions, although only ground-water abstraction and desalination can make meaningful contributions. It hopes augmentation will yield about 500-million litres a day.

For both options, there are serious environmental concerns. Groundwater abstraction can't be implemented without an artificial recharge system in place. This is because (under the Ghyben-Herzberg Principle) denser sea water will intrude laterally into the space left by the less dense fresh water abstracted from the aquifer.

When this happens, the entire body of fresh water - the most attractive option is the Cape Flats aquifer (with a capacity to yield up to 20-million cubic metres) - will be lost to the sea, forever. No volume of post facto recharge will recover it because the ocean is bigger. It is the way of osmosis.

Desalination is an attractive technology because of the vastness of the ocean. A big problem is that the brine discharge from the plant, presumably into the ocean, will destroy the immediate marine environment and may have worse effects if it is discharged on dry land.

International best practice shows that, if done properly, desalination can be part of a solution. In Perth, Western Australia, a desalination plant delivers 45-billion litres of fresh drinking water a year, about 18% of the city's needs. It is about 144-million litres a day, which can be raised to 250-million, energy permitting.

It is expensive. The plant in Sydney cost the equivalent of about R3.87bn to build and it uses 180GWh in energy a year. For Cape Town to augment its supply adequately, it must build at least two similar plants, bringing the cost to nearly R8bn.

Cape Town invited a tender for a desalination plant in July. It has not yet been awarded. The delay, says a City of Cape Town mayoral committee member, Xanthea Limberg, is because the design of tenders is complex, and any new scheme must fit into existing infrastructure.

"The tenders have to be done within the bounds of the Municipal Finance Management Act, which has prescribed processes. Everything possible is being done to... make it as fast as possible," she says.

Ricardo Pillay, a partner at law firm Dentons, supports the prudential approach, saying that the perceived lag does not stem

from negligence. The city is constrained by its obligation to follow strict legal procurement procedures that align with the Constitution and legislation.

"Failure to comply with tendering and public procurement laws could result in significant delays that would, in fact, impact on the lawfulness of the award of a tender with the consequent delays in the delivery of water to the public," he says.

Emergency conditions may be an excuse to bypass procedure, says Pillay, but doing so presents immense risk for state-owned entities and the public.

"For example, a disgruntled vendor who feels a contract was unlawfully awarded to another party could contest it in court, effectively bringing the project to a halt," he warns.

Conspicuous in its absence in the crisis is the national government. The Department of Water and Sanitation owns all the infrastructure that matters, but so far, it has taken no action to tackle the crisis, save for a visit by Water and Sanitation Minister Nomvula Mokonyane to Cape Town mayor Patricia de Lille, after which Mokonyane admonished citizens to save water.

With a contribution of up to 14% to SA's GDP, Cape Town's economy is invaluable to the entire country. It has grown at an average of 3.2% per year between 2005 and 2015, compared with between 1% and 2% for the whole of SA for most years since 2008.

Cape Town is in crisis, but for all of SA, this is a national emergency. A declaration of a national state of emergency is the rational response.

Most South Africans will remember the previous states of emergency, which allowed the apartheid state to grossly abuse its power. But the new State of Emergency Act of 1997 greatly curbs the state's powers and permits it to delegate authority to other levels of government - in this instance it should be the Western Cape government.

A state of emergency means the money will be found and the resources mobilised. It will also allow for a greater range of solutions to be considered, such as interbasin transfers via open aqueducts from the Gariep or Vanderkloof dams.

Such a feat is possible, even in the time available, says South African Institute of Civil Engineering CEO Manglin Pillay.

"SA has the skills and equipment to do whatever needs to be done," says Pillay. "What is lacking is the political will. This is an emergency and it is time for the best minds to meet to end the emergency. But whatever we do, we have to do it quickly."

Source: Business Day