

# Off-grid Cities: Elite infrastructure secession and social justice



## ***City sector profile*** ***Water in the City of Cape Town***

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*This document has been prepared as part of the NRF-funded project entitled Off-Grid Cities: Elite Infrastructure Secession and Social Justice. The insights and data used in this City Sector Profile are drawn from desktop research and fieldwork conducted between 2022 and 2023. This document aims to provide a brief overview of water in the City of Cape Town in relation to the investment of private households and businesses in alternative water sources.*

## **Cape Town's water-scape**

The Western Cape is a generally arid, drought-prone area with hot dry summers and generally cool wet winters. The pressure on scarce water resources remains strong. The City's insecure water supply is complicated by high levels of social inequality in Cape Town, with inequitable access to and consumption of water resources. Climate change is likely to exacerbate risks of drought, wildfires, flooding and extreme wind (OneWorld, 2018), and the Western Cape is especially vulnerable to these effects given its current climate variability (van Diemen and Engel, 2023).

The City of Cape Town (CoCT) reticulates most of its urban water supply from a network of major dams known as the Big Six reservoir system as well as drawing groundwater from three large aquifer groups (Ding et al, 2023). Importantly, the reservoir system supplies Cape Town and other parts

of the province through the Western Cape Water Supply System (WCWSS), which is a collective network of dams and other reticulation infrastructure. Cape Town is a key stakeholder in this system and uses 58% of the water supplied from this system (OECD, 2021). While the CoCT used water from two temporary desalination plants to augment supply following the 2015-2018 drought, this met only a fraction of the demand (1.5% of the target demand of 450 mega litres per day) and remains a costly option (Parsons, 2022). These desalination plants were shelved. Research is currently underway into a permanent desalination plant. The City is investigating options to add 300 million litres per day into the City's supply through groundwater abstraction, water reuse and desalination (Odendaal, 2023). Fears of another major drought have prompted these augmentation efforts.

Figure 1 provides a simplified diagram of the water supply system in the CoCT.

Residents and businesses, largely in response to water insecurity during and following the drought of 2015-2018, have installed boreholes and rainwater tanks to supplement municipal water supply and improve their own water security. While this helped reduce the consumption of municipal water and helped avoid public supply running out during the drought, it has also reduced municipal revenue, which is used to fund basic water service provision.

Cole et al. (2021: 11) note that a “key challenge facing cities in slow-onset disasters is that city government revenues are likely to be negatively impacted at the same time as significant new costs are introduced. A water

reticulation expert in the Western Cape claimed that current patterns of groundwater extraction and use are unsustainable (Pers. Comm, 2022). Expanding access to water without overburdening the strained water supply system is a key challenge.

Persistent segregation and growing informal settlements on land unsuitable for development exacerbate inequitable water supply (Enqvist and Ziervogel, 2019). The City’s poorest residents tend to have the worst access to water supply while also being most vulnerable to natural disasters and the impacts of climate change. Informal settlement dwellers are also poorly equipped to cope with disasters because of inadequate access to basic services, tenure insecurity and topographical challenges like living within flood plains.

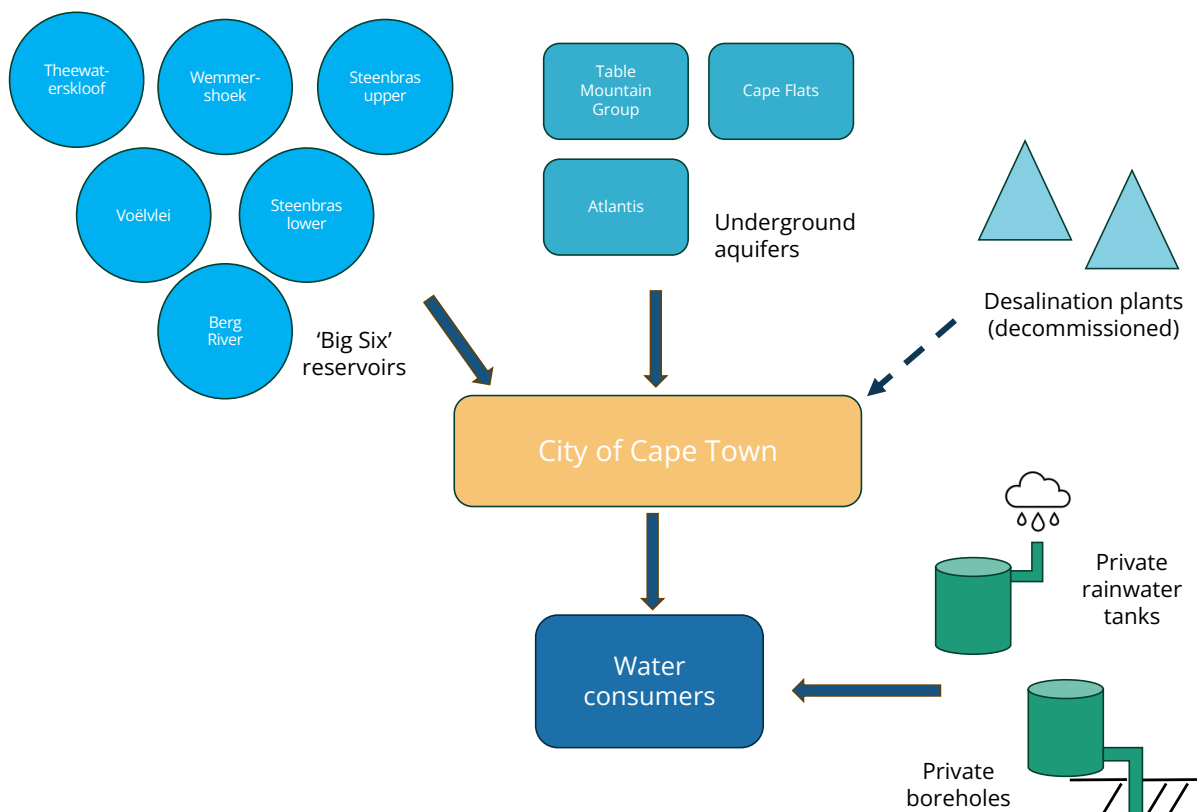


Figure 1: Simplified diagram of water sources in the City of Cape Town.

## Cape Town drought and day zero (2015–2018)

Cape Town’s Water Strategy (CoCT, 2019), Outlook (CoCT, 2022) and the general understanding of water security were prompted by responses to the major drought of 2015–2018. Successive years of below average rainfall saw the threat of municipal water supply being switched off, referred to as Day Zero, in late 2017 and early 2018. Day Zero was avoided by reduced consumption and demand, fixing water leaks, farmers upstream ‘donating water’, and augmentation efforts, as well as solid rain in winter of 2018. Reduced consumption of water by wealthy consumers and businesses helped reduce pressure on the municipal supply, partly through the installation of rainwater tanks, boreholes and well-points, but also has reduced municipal revenue in turn during the drought and since.

## Just transition approach to water in the City of Cape Town

CoCT’s Climate Change Strategy (CoCT, 2021: 20) envisions the City becoming “a climate-resilient, resource-efficient, and carbon-neutral city that enables inclusive economic development and healthy, thriving communities and ecosystems.” This vision is developed in line with just transition ideals that prioritise resilience, sustainability and protection of vulnerable workers. This Strategy, along with the CoCT Climate Change Action Plan (CoCT, 2018), shape the City’s just transition plan and intends to align with the national government commitments and with the Paris agreement.

One aspect of the CoCT’s just transition plans relates to the City’s intention to increase water reuse projects. The aim is for these to “position Cape Town as one of the

leading cities in the world in terms of sustainable water management” (CoCT, 2022: 6). The City is working to mainstream resilience across urban planning and management and specifically for water through the Cape Town Resilience Strategy (CoCT, 2019), which plans to build capacity for integrating climate adaptation and resilience to extreme events and disruptions. This strategy also highlights partnerships and collaboration as critical for water resilience and improving collective ownership of shared water resources. Moving past challenges of siloed local governance remains an important issue, and managing scarce water resources to satisfy growing demand and environmental sustainability in the face of major shocks like droughts and floods, are key to water resilience in CoCT.

## Ideology and plan for water delivery in the City of Cape Town

Cape Town’s Water Strategy is based on safe access to sufficient and reliable water, with a focus on wise use and ‘shared benefit (CoCT, 2019). These elements are incorporated into

the City’s vision of being a water-sensitive city.<sup>1</sup>

<sup>1</sup> <https://www.capetown.gov.za/Departments/Water%20and%20Sanitation%20Department>

“Although the Western Cape drought has largely been overcome, water scarcity remains a key driver in the national water sector.” (Greencape, 2021: 10). The drought response has reflected the potential of reducing national water consumption based on the successful load-reduction strategies implemented in Cape Town. Although CoCT’s Water strategy proposes an ambitious 40% reduction in consumption (CoCT, 2019), Gordon Hill-Lewis, the Mayor of CoCT, recently reported that consumption has steadily increased since the drought ended, both in overall terms due to population growth and consumption per capita as water security apparently stabilised. Given that behavioural change has not been sustained, and the City is currently increasing measures to cut down water usage again (Bredeveldt, 2023). Demand-side reduction of water use remains a key goal in CoCT’s Climate Change Action Plan (CoCT, 2018).

In addition to demand-side management, CoCT is working to increase water supply, including through exploiting additional

underground aquifers. The main three aquifers (Table Mountain Group, Cape Flats and Atlantis) in the region are being developed by the City for further abstraction, and the CoCT Water Outlook (2022: 6) states that these aquifers “are being, and will be, managed in an environmentally sensitive and sustainable manner.” Currently, the City “augments its surface water with ~7 megalitres per day (MLD) from groundwater and springs. This is likely to rise by ~40 MLD from the recently commissioned Table Mountain Group (TMG) aquifer when it is fully operational. Other phased augmentation schemes will contribute a total of ~240 MLD by 2026” (Greencape, 2022: 25). As mentioned above, the City is investigating possibilities for larger-scale, permanent desalination plants in the medium- to long-term “because it is scalable and not dependent on rainfall” (Greencape, 2022: 25). The City’s intention is to satisfy 25% of water demand through these augmentation measures once they are all fully operational (CoCT, 2022).

## City of Cape Town policy and legal frameworks<sup>2</sup>

South Africa’s constitution includes that “Everyone has the right to have access to sufficient food and water.” (RSA, 1996). To give effect to this right, Parliament has enacted the Water Services Act 108 of 1997 (RSA, 1997). The purpose of this Act is to provide for the right to basic water supply” (SAHRC, 2018: 1). The 2001 Free Basic Water Policy provisions for at least 25 litres of free water per person per day, which was amended in 2007 to apply only to indigent households (OECD, 2021). Local governments in South Africa, including CoCT, rely on revenue from the sale of basic

services (e.g. water and electricity) to fund infrastructure and service provision, where revenue from high-consuming customers (who are charged proportionately more than low-consuming customers, due to inclined block tariffs) cross-subsidise the provision of free water (Enqvist and van Oyen, 2023).

“The National Water Act (36 of 1998) (NWA) provides the legal framework for the effective and sustainable management of water resources (including surface water and groundwater) by the Department of Water and Sanitation (DWS) on behalf of the national government” (Greencape, 2022: 33).

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<sup>2</sup> A full review of policies related to water security and reticulation can be found in the City’s Climate

Change Strategy (CoCT, 2021) and Environmental Strategy (CoCT, 2017).

The Water Services Act (RSA, 1997: 2) recognises the “rights of access to basic water supply” that government is expected to provide “in a manner which is efficient, equitable and sustainable”. The Act (RSA, 1997: 12) outlines the regulatory frameworks and conditions for water service provision, including tariff determination, discontinuation measures, fairness and equitability, as well as “measures to promote water conservation and demand management”. However, this has proved difficult to implement in practice because, like the just transition approach, must balance social, economic and environmental justice concerns.

CoCT’s Water Strategy (2019) calls for a new relationship between citizens and water, drawing attention to the limits of water resources and the importance of conservation and reuse. The Municipal Systems Act (No. 32 of 2000: 2), notes that developmental goals of municipalities should be conducted “in harmony with their local natural environment”,. In other words, finite water resources should not be overexploited or damaged. The City’s Climate Change Strategy (CoCT, 2021) and Bioregional Plan (CoCT, 2015) both tie water reticulation and conservation to the broader responses to climate change and note the importance of clean water to human and environmental sustainability.

## Governance of water supply in Cape Town

The key department at the national and local level, in terms of water supply, is the Department of Water and Sanitation. The National Department determines policies, regulates water supply and use, and plays an oversight role for municipal departments. Michael Webster is the executive director of CoCT’s Department of Water and Sanitation and he oversees the various branches within CoCT (see Figure 2). CoCT supplies water through its internal Department of Water and Sanitation, each of which has a different mandate relating to the coordination between different levels of governance and scales of provision.

Figure 2 shows the links between different levels and organisations involved in water governance, with the complexity in the system demonstrates the potential for fragmentation (OECD, 2021). This

complexity results in both vertical and horizontal governance fragmentation where collaboration amongst different city departments remains a challenge, as does cooperation between local government and provincial/national governments. At each level of governance, the Departments of Water and Sanitation must collaborate with other departments as well as with international organisations. The actors regional and local levels must report to and align with directives from the department(s) at higher levels of governance. The fragmentation of water management, reticulation and use is also due to the issue of how interrelated water systems are fragmented in terms of storage and supply points but also interconnected to the whole water system. Fragmentation also comes from the lag between policy and implementation of policies and plans (OECD, 2021).



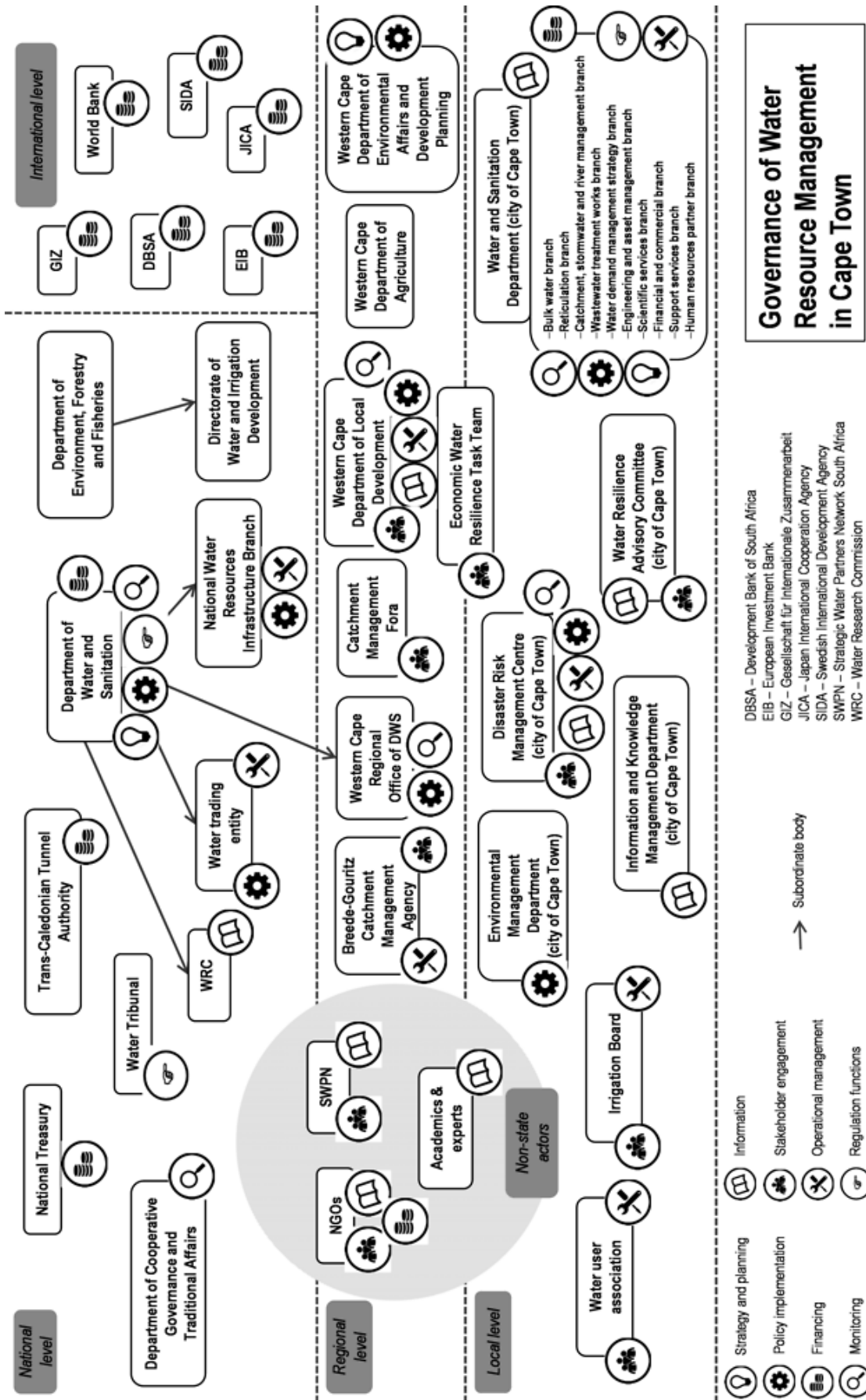


Figure 2: Governance of Water Resource Management in Cape Town (OECD, 2021).

## Private Sector Engagement

A key pillar of the CoCT's Climate Change Strategy (2021) is collaboration, including with the private sector, communities, NGOs and civil society organisations. This is part of the City's growing attempt to deepen engagement across stakeholders. During the 2015-2018 drought, the City gradually moved from a 'command and control' approach to a more collaborative approach to water governance (OECD, 2021). This saw more

partnerships working together with the private sector towards common goals on water saving and education. As part of the its water use reduction measures, the City has engaged with contractors, developers and plumbers "to ensure legislative compliance, water conservation, prevention of water contamination and availability of a sustainable water supply" (Bredeveldt, 2023).

## Community and Civil Society Engagement

The city's approach to the just transition and its climate change response is based on collaboration with communities and civil society. One of the key aims in the CoCT Water Strategy (CoCT, 2019: 5), includes "supporting active citizenship by substantially improving customer management and engagement". Despite intentions to improve engagement, it is worth noting that citizens are nonetheless characterised as customers.

Water User Associations and Irrigation Boards are important civil organisations through which the City and Western Cape Water Supply System engage with different water users. An example of this was a series of Water Resilient Cities Learning events, which were organised in collaboration with the South African Local Government Association (SALGA), USAID and GIZ and held between 2018-2022. These events focused on building capacity, innovation in water security and resilience, and increasing collaboration between local governments across the country (SACN, 2022). GreenCape is another important organisation that provides resources to stakeholders involved in the green economy, engages government,

and does in-depth market research reports on different aspects of the sector.

Crises like the 2015-2018 drought tend to increase the strain on relations between the local government and residents, despite drought management increasingly adopting a collaborative approach. One expert describes state-citizen engagements regarding groundwater use as follows: "Since the drought, there's been more effort to register boreholes and well points, but [CoCT's] been a bit weak on communicating that to the public, so a lot of people either don't know of the need to register, the registration process is not that clear or smooth, so a large number of those already installed are not easily identifiable on the existing databases." The City's water inspectors are increasing efforts at ensuring compliance and enforcing water by-laws, partly through issuing fines for unregistered boreholes, which may add to the tenuous relations between the City and residents (Bredeveldt, 2023).

Understanding the governance of water supply systems and the partners involved will be critical for ensuring water security in CoCT in the future.



## Off-grid cities: Elite infrastructure secession and social justice

The Off-grid Cities project, funded by the National Research Fund (NRF), has explored how private households and businesses in South Africa have invested in alternative electricity and water sources. The project has interrogated the imaginaries (motivations, justifications) and practices (financing, regulating, implementing) of elite infrastructure transitions in order to critically consider their outcomes for the current and future city in four dimensions: political, environmental, infrastructural, and financial. The research focused primarily on Cape Town and Johannesburg, and adopted an interdisciplinary approach including interviews, surveys, document analysis, geographical information systems (GIS) and visual methods. The core objective of the project is to explore how elite infrastructure transitions need to be integrated into debates on, and practices of, producing cities that are environmentally sustainable and socially just. The project builds on the social justice literature and introduces it into climate change scholarship in the global South, recognising that the actions of one social group affect resource allocation in highly unequal cities, and that the infrastructures of elites tend to be absent from urban climate thinking.

More information about the project can be found on the project website <https://offgridsa.wordpress.com/>

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