International Journal of Water Governance
8 (2021) 1–22 DOI: https://doi.org/10.25609/ijwg.8.2021.5780
Publisher: TU Delft OPEN
Publication date: 2021-05-12

Exploring productive Features of Infrastructure
Social Mobilisation during the Cape Town Water Crisis

Janina Herzog-Hawelka*

*Alumna of the University of Vienna, Department of International Development Studies
Email: inahawelka@gmail.com

Abstract

This article explores social mobilisation in the context of the 2018 water crisis in Cape Town. Water infrastructure reveals political realities and disciplines, directs and shapes the lives and lifestyles of different populations. The announcement of *Day Zero* caused various reactions across Cape Town but made clear that the water infrastructure was quotidian and unremarkable whilst working uninterruptedly. The interference of the water infrastructure created an awareness of water and its use across Cape Town. Capetonians developed daily strategies to cope with the situation. These strategies interfered with their daily tasks, impacted personal relationships, and revealed narrations of struggle and privilege. During the water crisis, people became experts on water-related topics and many residents engaged extensively with water realities that affected their own lives and the lives of those around them. Water realities arose from daily challenges which Capetonians were experiencing and as a result, they felt the need to address the issue with vigour, including in the form of social mobilisation, civic activism, and public participation processes.

Keywords: hydropolitics, infrastructure, urban metabolism, social mobilisation, Cape Town water crisis

1. Introduction

Cape Town: the first city to run out of water? With these words, many national and international newspapers announced the water scarcity that haunted the major city for almost three years. At the beginning of 2018, the situation reached its peak, and the City of Cape Town (CoCT) intensified its restrictions and penalties regarding citizens' water use. Day Zero, the day the taps

Please cite as: Herzog-Hawelka, J. (2021). Exploring Productive Features of Infrastructure. Social Mobilisation during the Cape Town Water Crisis. *International Journal of Water Governance* **8**, 1-22.

would run dry – meaning the storage reservoirs of the city would sink below the limit of 13.5% – was moving closer. The CoCT introduced 'Day Zero' as a communication campaign (Figs. 1, 2), implying that the municipality would cut off the water supply, in which case water would have to be distributed through 200 water allocation points (CoCT, 2017b). In order to not exceed this limit, the CoCT imposed regulations and measurements to target the population (CoCT, 2018; Rule et al., 2020b; Joubert & Ziervogel, 2019, p. 5; Rule et al., 2020a).

How did Capetonians make sense of these strategies regulating and limiting their daily water use? How did civic organisations contribute to public participation and inclusion during the crisis? What role does the system of water infrastructure and its disruption play regarding their agency? This article addresses these questions by introducing the reader to South African hydropolitics; thereafter an anthropological notion of infrastructure allows us to explore infrastructure's distinct features and productive potential for public participation. Lastly, I will seek to explicate how self-organising citizens' initiatives during the Cape Town water crisis and the threat of running out of water ultimately contribute to the creation of spaces for public participation.

An ethnographic investigation made visible that water infrastructure includes more in its system than pipes, taps and water itself. The operating principle of the system is governed by political-economic regulations around the availability, allocation, and management of water. My analysis is concerned with the question of "who gets what, when, where and how?" (Lasswell, 1960; Turton & Henwood, 2002, p. 16; Appel et al., 2018, p. 2) and how and why it accelerated an empowerment of civil society during the Cape Town water crisis. Diverse citizens' initiatives campaigned for their individual water concerns and created productive spaces for public participation accordingly.

Hydropolitics in South Africa and Cape Town and during the drought in particular were discussed in a broad context (Hellberg, 2014, 2018; Turton & Henwood, 2002; Mahlanza et al., 2016; Hall et al., 2006; Gowlland-Gualtieri, 2007; Bourblanc, 2012; McDonald & Pape, 2003; Rule et al., 2020a). An unwritten hydrosocial contract between government, civil society and the private sector regulates responsibilities and rights in terms of access and distribution of water (Turton & Meissner, 2002). Over the last century, South Africa underwent several political transformations that affected this contract and thus water governance substantially (Turton & Meissner, 2002, p. 40). After Apartheid, the newly elected government was eager to *equitably* redistribute hydropolitical privileges. Instead of curtailing the water rights of the previously advantaged South Africans, the decision was made to expand the privilege to the historically disadvantaged communities (Turton & Meissner, 2002, p. 54). Thus the *new* South Africa employed a Free Basic Water Policy (DWAF 2002) and implemented the right to have access to sufficient water in its Constitution (RSA 1996, s 27 (1)(b)), but moreover, nevertheless strongly communicated the obligation to pay for it, at the same time. This controversy was largely influenced by the dominant neoliberal paradigm during the 1990s and influenced questions on whether water is to be recognised as an economic or social good (International Conference on Water and the Environment 1992). In South Africa, this led to a growing social consciousness, and consequently, to an emerging civil society contesting prevalent water governance (Turton & Meissner, 2002, p. 44). The debate has also found its way into academic and public discourse. Municipalities in South Africa were widely criticised for their implementation of water governance. At the focus of the criticism was the reckless employment of policies of cost recovery that disproportionately affected the poor population of the country.

In order to stick to the regulations and for citizens not to exceed their financial means, the policies were often enforced with the installation of Water Management Devices[1] (WMD), often without prior notice or even consent, sometimes involving the entire disconnection of water services due to non-payment (Mahlanza et al., 2016; McDonald & Pape, 2003).

Technical, political, and techno-political forms of water service come together in a system of infrastructure allowing for physical and socio-economic movement, which at the same time affects users and their lives. Water infrastructure functions not only in its obvious purpose of channelling water to its users, but, moreover, facilitates a system for the transportation and communication of political regulations and norms. During the crisis, the system of water infrastructure was interrupted and damaged. The ad-hoc regulations and measurements by the CoCT affected citizens' lives and lifestyles and required adjustment to the new circumstances regarding water management and allocation. These adjustments did not always follow the predetermined path but led to a diverse array of forms of agency.

Different scholars illuminated on the ability of water infrastructure to govern life by addressing various sections of the population in dissimilar ways, which lastly leads to the emergence of distinct forms of citizenship (von Schnitzler, 2013; Hellberg, 2014; McDonald & Pape, 2003; Mahlanza et al., 2016; Harris et al., 2018; Rodina & Harris, 2016). Moving civic activism in times of a disruption of the water infrastructure to the centre of the exploration, I will elucidate these initiatives as productive features of infrastructure ultimately contributing to empowerment and upward social mobility. People became experts on water-related topics and many residents spoke out extensively about the water realities that affected their own lives and the lives of those around them. In many cases, social media provided the platform for communication. Furthermore, self-organising citizens' initiatives and different forms of public activism evolved with the demand to address these challenges.

The research underlying this article began four months after the Day Zero scenario was cancelled in March for the year 2018. For two months, I experienced the living conditions and environment of the drought and explored people's everyday practices around water use. Studying infrastructure ethnographically allows us to trace associations of heterogeneous networks including material and ideological perspectives, which, in turn, offers a valuable understanding of urban mobility, both physical and social (Larkin, 2013, p. 331). Following a qualitative social research approach and grasping cities and urban life in the context of citizens and their everyday experience, this research conceives of urban spaces as constructed through citizens' practices and their social relationships and interactions (Lindón, 2013, p. 59; Harvey, 2003, p. 939). At the centre of my approach is the critical engagement with the field through participant observation and semi-structured narrative interviews to explore the lived experiences of my research and interview partners. To that extant: "[n]arrative theorists define narrative as a distinct form of discourse: as meaning making through the shaping or ordering of experience, a way of understanding one's own or other's actions, of organizing events and objects into a meaningful whole, of connecting and seeing the consequences of actions and events over time." (Chase, 2011, p. 421). In 19 interviews and one group discussion, water users and civil activists told their stories about their water consumption and the impact of the water crisis. The selection of my study areas and interview partners within Cape Town were guided

[1] Water flow limiter

by the approach of "following the people" within the infrastructure system and was influenced by accessibility to the different communities as well as my limited time frame[2] (Marcus, 1995, p. 106).

2. Hydropolitcs before and during the crisis

Since the beginning of the 1990s, South Africa has been undergoing massive transformations which also had implications on public service delivery. After the first free elections, the country had to work out how to overcome the massive inequalities which the Apartheid regime placed on society. The introduction of the White Paper on Water and Sanitation of 1994 points to the immense polarisation between rich and poor (DWAF 1994). It was the first official document that picked up on the nuisances in the water service supply system after the abolishment of Apartheid. The newly developed cornerstone of the water supply policy was the provision of at least 25 litres of water per person per day within a maximum distance of 200 metres from their dwelling (DWAF 1994, p. 15). Although the White Paper has a clear vision about water as a basic human right that is "gifted from God", it also points to the costs associated with constructing, running and maintaining the system of infrastructure and the need to create a stable financial policy that only allows subsidies for minimum service provision (DWAF 1994, pp. 17, 23).

The post-Apartheid government was the first government in the world to enshrine the basic right to water into its Constitution (RSA 1996; Bourblanc, 2012, p. 640; Funke et al., 2007, p. 16; Stein, 2002, p. 117). South Africa's water legislation was one of the most advanced during the time, especially in terms of its scope and objectives as well as its inclusion of civil society (Ashton & Haasbroek, 2002, p. 191; Funke et al., 2007, p. 14; Meissner et al., 2019, p. 19; Muller, 2007, p. 37). The new National Water Act (RSA 1998) was developed democratically, featuring the inclusion of civil society, and acknowledges water as a natural resource that everyone should have access to. The act nevertheless recognised the need to protect water resources, to sustainably utilise them and as a consequence, to responsibly manage them (Ashton & Haasbroek, 2002, p. 191). International organisations also acknowledged the government's water reforms in terms of water rights and policies (World Bank 2004, pp. 6, 16, 24; UN WWAP 2006, p. 13). Although the new government ensured access to water to large parts of the population that were previously unserved (Muller, 2007, p. 34; DWAF 2004, p. 34, 2005, p. 48), it was criticized by civil society as well as academics for its poorly thought-out or even reckless implementation of policies of cost recovery going hand in hand with the right to water (McDonald & Pape, 2003; Gowlland-Gualtieri, 2007; Earle et al., 2005; Narsiah, 2013; von Schnitzler, 2016). In Cape Town, the first census including all South African citizens in 1996 showed that 89% of Capetonians had access to sanitation facilities, whereas 79% had piped water connected to their residences. The census nevertheless showed huge differences between the neighbourhoods. In some areas on the Cape Flats[3] such as Gugulethu, Nyanga or

[2] Field research from 22nd July – 27th September 2018
[3] Sandy and windy area north of the inner city; area where non-white households had been forcibly removed to as result of the Group Areas Act during Apartheid (RSA, 1950)

Khayalitsha[4], only every tenth household had piped water. In 2011[5], 50% of the black population in Cape Town still had no piped water in their homes (CoCT 2012, p. 4).

Long before the first Dutch settlers arrived in Cape Town in 1652, the place was known as *Camissa* – a Khoi word meaning the place of sweet waters. The abundance of springs was one of the reasons settlers were drawn to the area in the first place (Kotze, 2010, p. 27). Nevertheless, because of its Mediterranean climate, the Cape had always been defined by hot and dry summers and rainy winters (van Vuuren, 2012, p. 23; Sorensen, 2017, p. 515). Due to these weather conditions as well as the composition of the water delivery system, rainwater must be collected and stored over the winter months to supply Cape Town with water throughout the entire year. The city's water supply relies almost entirely on the catchment of rainfall. Fourteen dams located in the catchment areas east and northeast of the city where rainfall is highest due to the surrounding mountains, provide 98% of water to the city, whereas the major six dams provide approximately 900 million m³ (Rule et al., 2020b). The unconstrained daily demand usually stands at about 1350 million litres per day and supplies the citizens and businesses of Cape Town, as well as agriculture and some other urban areas (CoCT 2018, p. 1; Muller, 2019, p. 2; Visser, 2018, p. 1). To overcome the hot and dry summer, the CoCT often must apply water restrictions at the end of summer to bypass the period to the next winter rain. For that reason, surface water as the sole source of the water supply can no longer meet the water supply needs in Cape Town faced with a growing population and changing weather patterns (Ziervogel et al., 2010; Visser, 2018, p. 3). As a result, Cape Town and the Western Cape region experienced struggles in terms of water supply that ultimately required the government to respond and direct the issue.

To date, the Western Cape is the only province not governed by the African National Congress (ANC). Against this backdrop, the province, and in particular Cape Town, occupy a special role in the context of South African political power which has to be considered regarding Cape Town's urban governance. Struggling to overcome the legacy of Apartheid coupled with resource limits and scarcities, Cape Town experienced a prolonged drought (2015-2018) that culminated in the announcement of Day Zero. The citizens of Cape Town then underwent a period of strict policies and interventions by the city government to overcome this crisis.

While in November 2014, the winter rains could still fill the dams, a year later the dams were only 71% full and the prolonged drought thus had its origin. Another year later, the dam levels were at 60% and at an alarming 38% capacity at the beginning of summer 2017 (Joubert & Ziervogel, 2019, p. 5; Rule et al., 2020a, p. 2). With the declining dam levels, the city government adjusted the restriction levels and with it, the water tariffs. The crisis reached its peak when the CoCT launched its Day Zero campaign in November 2017 and started a countdown for its occurrence. This shift of the water crisis management came for many Capetonians rather abruptly. Having campaigned before with the slogan, "a well-run city does not run out of water", mayor Patricia de Lille changed her course of action and turned from supply management to demand management and the implementation of what Capetonians identified as scare tactics.[6]

[4] Black townships
[5] Most recent census
[6] For more detailed information on the drought chronology: Joubert & Ziervogel (2019); Visser (2018). Also see the Drought Timeline by the Western Cape Economic Development Partnership (2018).

While working nonstop, water provision in Cape Town was managed through several approaches addressing different parts and areas of the population with distinct political, technical, and techno-political measures. For all households directly connected to the municipal water system, a block tariff applies. Each additional unit of water used becomes more expensive as greater volumes are used (based on a block system). The block system counts six blocks, while the basic usage (0 – 6 kl) is free of charge for all residents and an extra 4.5 kilolitre for those residents who fall under the poverty relief category and who applied for an indigent grant[7] (CoCT, 2017a, p. 44.1). For metering purposes, multiple technologies are available to domestic users to monitor their water use. The CoCT promoted the installation of WMDs which limit the daily water use to an allocated amount and therefore guarantee free basic water to their users. WMDs are often installed to ensure cost-recovery within poor communities and to avoid an inability to pay. The meter is sold as pro-poor i.e., helping to manage water consumption, and providing residents with the free daily allocation without worrying about any further charges. The local government moreover incentivised the installation with the writing off of all water and sewerage arrears as well as the repair of all faulty plumbing free of charge (CoCT, 2017d).

Alongside the block tariffs, restriction levels apply depending on the amount of water needed to be saved to get through the dry season. Tariffs are linked to the restriction levels, meaning a higher restriction level translates into higher tariffs.[8] The idea behind the restriction levels is to save the amount of water requested and therein face no increase in actual costs. This way, the CoCT also aims to secure the necessary revenue for maintaining the infrastructure.

With the drought situation, the CoCT found itself in a catch-22: on the one hand, citizens had to be motivated to use as little water as possible to avoid the Day Zero scenario, but on the other hand, the CoCT was reliant on the ratepayers' funding to keep the system of infrastructure maintained. Cape Town's water legislation had already been contested before, but during the water crisis, water management seemed unable to introduce sustainable measurements. To overcome the water crisis, the CoCT followed three approaches: a) managing the remaining water in the dams, b) reducing demand as much as possible and c) developing alternatives to provide the city with water.

a) Managing dam levels

During the drought in 2018, this demand had to be reduced heavily. The CoCT and the national Department of Water and Sanitation therefore closely monitored the dam levels and communicated them to the public via various on and offline channels. All further restrictions and resulting strategies were based on the remaining water in the dams which the Day Zero

[7] For the financial year 2017/ 2018 and based on the assumption a household has four members, which mostly does not reflect the living conditions of those people applying for the grant.
[8] Level 2 – saving 20%, level 3 – saving 30% etc.

scenario was based on (calculated using maximum evaporation, urban and agricultural use[9]) (CoCT, 2018, p. 2; Rule et al., 2020a, p. 2).

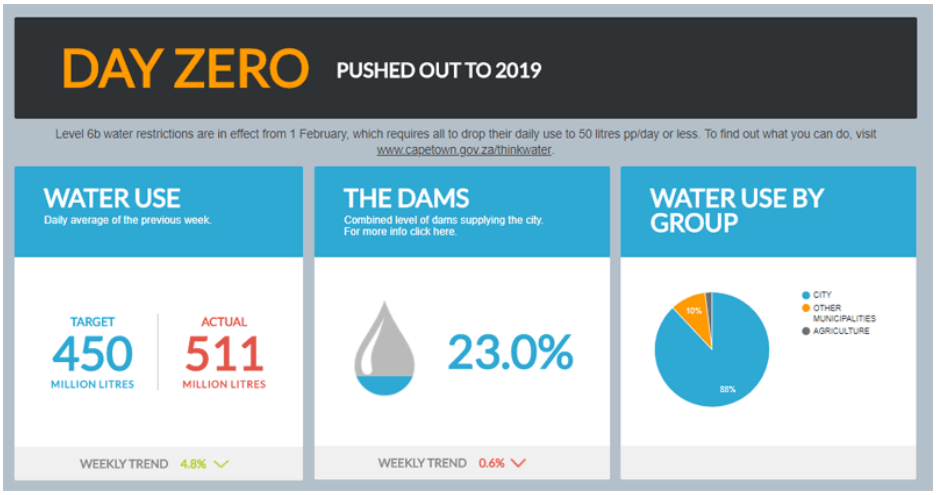


Figure 1: Screenshot Water Dashboard
Source: https://coct.co/water-dashboard/ (5 February 2018)

b) Demand Management

To reduce the demand, the CoCT developed strategies to address Cape Town's population. Pressure reduction was one approach to compel lower usage. In some areas, this has led to the wholesale cut-off of the water provision, particularly when they were situated on a hill. The communication campaign #ThinkWater encouraged people to reduce their daily water use autonomously. Part of the campaign was awareness creation to provide information on how to use 50 litres wisely on a regular day. But the CoCT was also behind the efforts that people identified as 'naming and shaming' campaigns, starting with the release of the 100 worst water abusers in February 2017[10] as well as the roll-out of a water map providing sensitive information on every household's water use publicly via an online tool. These approaches were heavily criticized for their failure to adequately address Capetonians' needs as various civic activists and initiatives I interviewed[11] declared. A survey by the Human Science Research Council revealed that not even half of the respondents (43%) "felt that the authorities had dealt very effectively with the drought" (Rule et al., 2020a, p. 2).

At the peak of the crisis, daily individual consumption had to be reduced to 50 litres per person per day to reach an overall goal for the city of 450 million litres per day including businesses and agriculture. For every usage above the 50 litres, the CoCT applied punitive tariffs according to restriction Level 6B (CoCT, 2018, p. 2). Furthermore, the restriction levels regulate how water is to be used and what citizens were prohibited from doing.

[9] Which was heavily criticised by citizens initiatives (Shaheed Mahomed – 29.08.2018, Justice4CapeTown – 08.09.2018)
[10] https://www.capetown.gov.za/media-and-news/Drought%20crisis%20121%20days%20of%20useable%20water%20left
[11] Shaheed Mahomed – 29.08.2018, Lester September – 04.09.2018, Justice4CapeTown – 08.09.2018

Fig. 2: Communication Campaigns
Source: Own photos

The CoCT furthermore began installing WMDs in households of excessive water users. With the enforcement of restriction Level 4B, households exceeding 20 kilolitres per month were compellingly equipped with a WMD. In March 2018, the CoCT listed over 10,500 non-indigent water users exceeding 20 kilolitres per month. Restricting those households would reduce water consumption by 87% a year, the city government argued (CoCT, 2018, p. 2). The installation of WMD, however, caused considerable anger within communities. People reported that they had a WMD installed without prior notice and subsequently received the bill to pay for the device as well.

c) Supply Management

Since Cape Town is almost exclusively supplied by rainwater collected during the rainy season, voices got loud in pushing for the city to be provided with additional water sources especially since the area is rich in natural springs. These springs were in the centre of public outrage due to their contested rights of use and access due to physical boundaries as well as a neoliberal perception of water as an economic good. Along the same lines of argumentation is the accusation of citizens' initiatives that, the city government would instrumentalise the crisis to justify large-scale investments, especially in desalination plants that they felt were unnecessary.

Due to this dissatisfaction with the water crisis management, many citizens took part in protest actions to give their grievances a voice. Furthermore, even before the water crisis, Cape Town was one of the most protest-prone municipalities within South Africa. More than half of the protests can be linked to "municipal services or municipal (mal)administration, indicating high levels of dissatisfaction in urban spaces" (South African Cities Network 2016, p. 153).

During the water crisis, dissatisfaction with governing logics in the context of its management led to an increase in public participation and civic activism. People organised in groups to campaign against the water crisis management. Often these initiatives included like-minded people with similar experience and concerns or those who stood up for others whose

voices they felt were not getting heard. Protest actions ranged from letter writing and demonstrations to handing over a memorandum to the local government. These self-organising citizens' initiatives attempted to fill the gap where state and municipal provisioning was inadequate and created a space for grassroots public participation during the Cape Town water crisis. By sharing and directing information, protesting, and lastly, making sure people receive water, these initiatives are creating spaces for public participation and are therefore productive features of Cape Town's overall water infrastructure system.

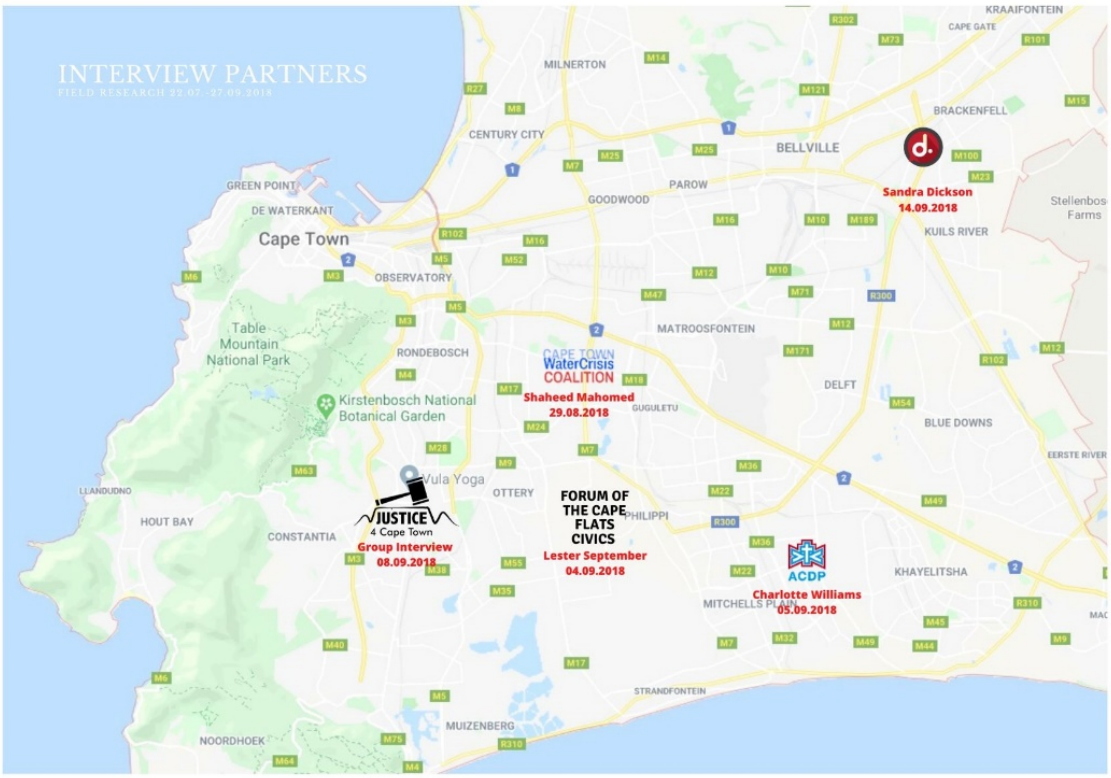
3. The Dynamics of Infrastructure

Cities are generally considered to be spaces of highly dense human populations residing and working in variously built infrastructures, connected through systems that guarantee the movement of people, knowledge, and technologies. Yet most important, cities are agglomerations of people and their interactions relying on and (re)producing these infrastructures that facilitate communication and movement. This complexity of movements – socio-ecological and techno-political – can be studied as an urban metabolism holding together different forms of infrastructure (Currie et al., 2017, p. 91; Amin & Thrift, 2017, p. 3; Swyngedouw, 2011, p. 21). Infrastructure is not necessarily bound to be material but includes the circulation of social, political and economic power as well as ecological processes that likewise contribute to the nature of the city (Coates, 2019, p. 63; Swyngedouw, 2011, p. 22). Specifically: "the metabolic process […] is energized through the fusion of the physical properties and creative capacities of humans with those of non-humans." (Swyngedouw, 2011, p. 24). A metabolic system serves as the base for every city and the life inside it, wherein, water and sanitation, energy and electricity, news, knowledge, and ideas are circulated and steered through a system of provisioning.

A metabolic understanding of infrastructure facilitates a notion of system-thinking and allows tracing of diverse associations between different networks – technical, ecological, and social. Infrastructure – understood as a technical system – is supposed to ease the organisation of daily life. In order to study a city and disregard its infrastructure networks, such as pipes and sewers or cables and plugs, one would be ignoring a crucial mechanism affecting social justice and power positions (Star, 1999, p. 379; Anand, 2015). Nevertheless, shifting the focus away from the technology towards the system itself helps us to understand organising principals established by prevalent power relations (Larkin, 2013, pp. 330–331). Regarding the water infrastructure system in Cape Town, dams, pipes, pumps, and taps featuring a catalogue of policies on access, availability, allocation, and management, all circulate water through the system. However, it is not only water that is moving through the system but also people and their ideas that are affected by its organising principles. With their ability to interact and collaborate, people are creating "intersections of sociality" and produce spaces for active engagement with their dissatisfaction about service delivery (Simone, 2004, p. 407). These intertwining infrastructures and therefore the city itself are highly politicised: "cities are systems for directing and for provisioning life in ways that produce immense combinatorial power and immense constraint" (Amin & Thrift, 2017, p. 4).

3.1. Citizens' Initiatives as Productive Features of Infrastructure

The water crisis in Cape Town created several layers of disagreement. Capetonians disliked and rejected the water crisis management for various reasons. These discrepancies led to the mobilisation of like-minded people and the creation of self-organising citizens' initiatives. At the centre of these initiatives was often the claim for more inclusion and public participation. Water infrastructure in Cape Town became the locus for active negotiations during its disruption. It created a contested terrain due to different conceptions of what is to be included and excluded in a system of provisioning. Who has access and how is access provided? What is provided as a public good and what is understood to be a private commodity? The engagement and mobilisation of citizens' initiatives took place organised around these questions especially because people felt their aspirations were not being addressed by the local authorities, in particular, during the period of the crisis.



Map 1: The map shows the locations of the activists and initiatives I interviewed during my field research.

During my field research, I identified a range of self-organising citizens' initiatives that mobilised in the context of the crisis and its management. Some of these initiatives were by activists that acted in their own capacity, whereas others were organisations of like-minded people coming together to address common interests. All initiatives had in common that they were somehow dissatisfied with the municipal response to the drought and urban provisioning in general. Provisioning in this regard does not solely refer to the reliable and uninterrupted supply of water (or other essential services) but, furthermore, to trustworthy information and to an inclusive system of urban governance along with it. The process of sense-making and the organisation of daily life with water governance is, hence, not only defined by the physical access to water and the mundane material objects that provide, regulate, or withdraw it, but furthermore, by the social networks through which everyday political claims are made (Anand,

2011, p. 545). It is thus hardly surprising that a social uprising took place in the context of dissatisfaction with water governance during the water crisis in Cape Town.

At the centre of my investigation was the identification of how Capetonians perceived the interference regarding water governance and how it shaped their own lives and agency. Especially in lower income areas, residents did not know whom to turn to with their service delivery complaints. The water crisis drew attention to the sensitivity of urban water infrastructure and made daily routines and activities such as doing laundry and hygiene routines more difficult. The covertly functioning system therein became visible. By publicly communicating savings strategies, such as behaviour on the toilet, boundaries between what was commonly understood to be private or public became blurry: "infrastructures often quite literally connect and constitute boundaries between public and private, boundaries that people sometimes reject or attempt to transgress. Governance […] does not take place at a distance but through the intimacy and proximity of toilets, pipes, and potholed roads" (Appel et al., 2018, p. 28).

> *[…] you can't flush your toilet after you make a number one because it's wasteful because every toilet uses like 15 litres of water to flush once. Then they [the CoCT] encouraged us to fill a bottle of water, like greywater, and put it in your system so your system instead of taking the 15 litres, it's maybe now take 10 because you're displacing some of the water. Then it just got progressively you were to then use – only wash when you have a big load of washing.*[12]

The water crisis in Cape Town thus interrupted the urban metabolism in various ways. It affected urban flows of water, people, their ideas, and information. While water was flowing slower and sometimes not at all, people shared information and saving strategies and produced and circulated what Robins (2019) recognised as "water facts". *Water facts* also spread due to an inconsistency in messaging from the CoCT to its citizens and resulted in the circulation of assumptions and claims of truth about water, its availability and distribution, and moral obligations, and were contested by civil society and experts alike (Robins, 2019, p. 7).

3.2. Representing Cape Town's Vulnerable Groups

Infrastructure is never built de novo, but develops from previous techno-political and historical arrangements (Anand, 2015; Star, 1999, p. 382; von Schnitzler, 2018). Thinking of cities, this feature becomes very visible. Ancient building structures remind us of former societal and cultural circumstances, streets and railways connect or separate communities to serve a political agenda, whilst names and designations engender memories of former power relations. In Cape Town, memories of the past are therefore also inscribed in the urban water infrastructure. As the place where the first settlers arrived to stay more than 350 years ago, Cape Town developed as a vibrant city that – prior to the Apartheid segregation – was known for its cosmopolitan and rather liberal atmosphere (Bickford-Smith, 1995, p. 68). Camissa, the place of sweet waters, offered its various inhabitants fertile land due to the countless rivers and streams in the area. Nevertheless, the Cape has always been shaped by seasonal rains and requires its residents to adjust to these circumstances.

[12] Interviewee – 1 August 2018

During the colonisation of South Africa, spatial segregation was implemented which has had a major influence on various kinds of urban flows. Infrastructure that eased surveillance and control during the years of the Apartheid regime still serves to separate present communities and provides citizens with inadequate living spaces often without water and electricity. Although Apartheid was abolished 25 years ago, the city remains segregated by old racial patterns. In South African cities, this has resulted in deepening social polarisation on account of some being able to pay for services and some simply being unable. Day Zero conveyed class and racial inequalities and reproduced historically grown injustice. Paying "[a]ttention to infrastructure allows us to show the making and management of difference— class, race, gender, religion, and beyond—in the technics and politics of everyday life" (Appel et al., 2018, p. 28). Lester September[13], chairperson of the Forum of the Cape Flats Civics underpinned this viewpoint and stated that the biggest concern in the context of the water crisis was Apartheid spatial planning: "you're pushing people to the edge. Then the water crisis comes in and pushes them over the edge because people are already living on the edges."

Against this backdrop, Justice4CapeTown[14] got involved to ease the burden on previously disadvantaged and senior citizens during the water crisis who, they revealed, were the most vulnerable in the context of the water crisis. In a group interview with eight members of the initiative, they explained that their engagement largely resulted out of the unfair treatment of the residents of Cape Town by the CoCT during the water crisis such as the tariff increases, the installation of WMDs, and scare tactics designed to push for the enforcement of their measure. The policies and strategies by the city government addressed different communities of Cape Town disproportionately. The reward for tremendous savings was financial burdens resulting from tariff rates, the group elaborated. Justice4CapeTown especially addressed the problem that the city government was not representing all residents of Cape Town equally and that their drought management and policies did not account for the realities of people's lives:

> *It's mostly white people sitting there. Normally, they don't have more than two children or three children or whatever. Our communities are very different. Because of Apartheid and because we were thrown out of our areas that we were staying, we were forced to move in on property, two families, three families per property. We still have that where there's maybe eight to ten people living on a property. That's in every basically coloured community that you go to, no matter where you go. To assume that there's only four people per household is ridiculous and to assume that you only need 350 litres of water per day doesn't make sense for a family of eight or ten.*[15]

As a group, they focused on the representation of the coloured[16] communities of Cape Town, which they felt were not represented by the CoCT up to that point. Black communities were

[13] Interview - 4 September 2018
[14] Group interview - 8 September 2018
[15] Member of Justice4CapeTown
[16] "Under this system, the category 'Coloureds' referred to an ethnically and culturally heterogeneous group of people descended from the indigenous Khoi and San people, the slave population, and the progeny of sexual contacts between these groups – and Bantu-speaking people – with European settlers; 'Bantu' (or 'Africans') referred to descendants of the groups of Bantu-speaking, iron-working cultivators who had begun to settle the northern and eastern parts of Southern Africa between 300 and 400 AD; 'Whites' referred to descendants of European settlers or more recent immigrants of European stock. The categories, however, were often arbitrarily applied, sometimes with tragic consequences for individual families or households" (Wilkinson, 2000, p. 197).

understood to be previously disadvantaged and would therefore benefit from policies addressing these conditions, whereas coloured communities would not benefit from them, even though they were likewise disadvantaged and forcibly removed from their homes during Apartheid.

The initiative emphasised the need to rethink infrastructure with its material compositions as well as legal and political-economic features. Infrastructure as constructed through various political rationalities of the past and present makes them unsteady and in need of constant maintenance and management (Anand, 2015). Remnants of the past often provoke a certain level of discontent in social groups that are connected to memories of domination. To this day, spatial segregation in Cape Town is still exceedingly visible and affects people's access to service delivery in every way. Infrastructure that usually provides urban flows ultimately jeopardised and policed movement during Apartheid (von Schnitzler, 2018, p. 138). Undoing these inequalities remains a major problem for South African cities. Water infrastructure in Cape Town thus uncovers historically grown issues of class and race.

Due to the policies' feature of largely implementing saving strategies that require a household connection to the municipality's water infrastructure, the middle and working class were identified as the focus of the crisis management (Rule et al., 2020a, p. 2). Hence, other communities felt that the strategies did not mirror their water realities:

> *Especially on the Cape Flats, when Helen Zille tried to tell people to shower with a skottel and a waslappie[17], it was such an insult to poor people because poor people have been washing like that for years, for decades, especially people in informal settlements, they don't have showers. All they have is a bucket and a lappie.*[18]

Justice4CapeTown explained how communities felt that they were not being taken seriously by their local government, who seemed rather uninformed about their living conditions and water realities. This lack of information about citizens' lives conveys issues of marginalisation in terms of overall service delivery and the management of the crisis in particular. Although people have access to water, they are excluded from the system of infrastructure in the sense that their individual needs are not getting addressed, and that public participation is limited. This understanding of water infrastructure as equally composed of ideological components, flows of information, and knowledge that facilitate the continuous flow of water, was also interrupted by the crisis.

While Hellberg (2014, p. 230) investigated how contemporary politics in the context of water provisioning in eThekwini address communities with different technopolitical measures and therefore distinguishes different forms of life, the accusation towards the CoCT during the water crisis was a rather "one-size-fits-all" approach. Nevertheless, the crisis regulations and measurements resulted in similar forms of demarcations of different forms of life. Distinctions were not (re)produced using different technopolitical objects and accompanying policies but rather due to the use of the same objects and policies for different realities that therefore did not meet their needs, as Justice4CapeTown expounds.

The South African Constitution provides a progressive legal framework for public participation, especially at the local level. At the same time, the CoCT declares itself to be an

[17] Afrikaans: a bowl and a washcloth
[18] Member of Justice4CapeTown

inclusive city supporting public participation processes (CoCT, 2017c, pp. 28, 39,53). However, many of my interview partners complained about an overall lack of information on who to call about their specific service delivery concerns or requests. Vice versa, the responsible local councils often lack the capacity to get involved (Thompson, 2014, p. 56; The South African Civil Society Information Service 2014; Tshoose, 2017, pp. 14–15; Bénit-Gbaffou, 2008, p. 4). Ward[19] committees and councillors are directly elected to represent interests of the community and ideally function as a mouthpiece between the community and the municipality. In practice, however, many residents lack information about how to make use of their right to involvement in local public participation processes, as Charlotte Williams[20], Ward Councillor for a part of Mitchell's Plain, a suburb on the Cape Flats, explained. Her office was crowded when I met her for our interview. Residents were waiting to talk to her about their individual water issues. She was also genuinely concerned about the pensioners, as they often dealt with disconnections due to tariff increases that affected their living costs. She emphasised that administrative hurdles for people to get support with their individual water service are exceedingly high that in the end, people are on their own, with their unaffordable water bills.

3.3. The Water Crisis Coalition and the Anti-Privatisation Movement

The announcement of Day Zero, generally elicited different reactions across Cape Town but it made clear that for middleclass homeowners, the infrastructure was mundane and boring whilst working reliably nonstop (Star, 1999, p. 377). The interventions of the water infrastructure created an awareness of water and its flow rates across Cape Town. Water infrastructure became contested terrain in several ways and people actively pursued the particulars on their rights, entitlements, and limitations. This awareness of cities as systems of urban metabolism, a space for exchange, communication, and interaction again mobilises people, ideas, and things and thus negotiation processes. By exchanging knowledge and dreams about water and to whom it belongs and how it is to be accessed and used, people played an active part in producing their environment. The urban realm is therefore a productive space that is constantly reworked as such (Holm, 2011, p. 92). The relation between the city, its infrastructure and urban dwellers is thus dialectical, as the city infrastructure in turn affects its inhabitants and their (well-)being in the city. I explored previously how infrastructure is never built from scratch but relies on former power relations. Additionally, infrastructure is created with a vision of progress, development and freedom as well as political agenda (Appel et al., 2018, p. 3; Harvey, 2018, 80). Reproducing the city and imagining different (urban) futures and acting upon them to transform the environment creates inclusive spaces for active participation (Harvey, 2003, p. 939).

The Water Crisis Coalition (WCC) recognised this potential and encouraged citizens to contest the infrastructure system as they know it and to envision a city where everyone has a right and access to water. The initiative was established on the 15th of January 2018 through several organisations and individuals intending to protect water as a public good, which they felt was particularly endangered during the water crisis. The coalition drew up a petition[21] for the rejection of the budget of the CoCT and the privatisation of water. Included amongst the claims was the objection to the building of desalination plants and the installation of WMDs,

[19] Cape Town is divided into 116 wards. Wards are groups of neighbouring suburbs that are managed together (https://www.capetown.gov.za/Family%20and%20home/Meet-the-City/city-council/wards).
[20] Interview – 5 September 2018
[21] https://awethu.amandla.mobi/petitions/down-with-the-budget-2018-19-we-reject-privatization-of-water

the reduction of the water tariffs, the opening of all 70 springs to the public, as well as the improvement of the infrastructure including the repair of all leaks, the protection of the aquifers and the cessation of all privatisation approaches within water services.

Shaheed Mahomed[22], a driving force behind the initiative, comes from a generation of activists from the 1980s who have long been fighting the capitalist system. He described exposure of exploitative relations as one of the main tasks of the coalition:

> *It's a drought, but capitalism is opportunistic. Where there's an opportunity, they would seek to exacerbate it and take full advantage out of it. They want to restrict; they want to create an artificial scarcity. If people are using water and getting free access to water, why should the bottled water industry exist, why should it be making it super profits?*[23]

He emphasised the importance of education to challenge the ruling system and its contribution to mass mobilisation. To imagine and create different urban scenarios is a productive source of city-creating-exercises which encouraged citizens to become active citizens (Harvey, 2003, p. 940). Infrastructure systems and therefore cities constitute notions and aspirations of everyday life and expectations of the future. This productive feature of infrastructure holds promises of modernity, social upward mobility and freedom (Holm, 2011, p. 94; Appel et al., 2018, pp 11, 27).

Shaheed strongly criticised the implementation of the neoliberal paradigm in the context of water provisioning. As citizens are compelled to develop a proactive attitude towards water use, state responsibilities are being reduced to a minimum. With the water crisis and its regulations and measures, Capetonians were obliged to develop a calculative and efficient outlook. Moreover, the water crisis created a sense of belonging linked to moral obligations as people identified themselves as water savers and others as non-savers. These identifications are not only based on self-perception, but much more often based on external attributions and led to generalisations about certain communities. These narrations of distinction revealed group identifications and forms of demarcation along class boundaries, which in South Africa are often associated with entrenched racial categories.

3.4. Encouraging Participative Governance

The initiative that Sandra Dickson[24] brought to life addressed the phenomenon of administrative hurdles and lack of participation from a different perspective. Already in 2017, she started a campaign to fight against the tariff increase of electricity units to express her dissatisfaction with service delivery. When the CoCT proposed a drought-charge linked to the property value, Sandra, who herself lives in a residential area with free-standing houses in the northern suburbs of the city, was outraged.

Sandra criticised that most people were not aware of their rights to participation and if they were, they often lacked the channels for getting involved. Teaming up with an activist from Johannesburg, she created a simple website that facilitated participative governance through a legislative framework, the Promotion of Administrative Justice Act (PAJA). The act

[22] Interview – 29 August 2018
[23] Shaheed Mahomed - 29 August 2018
[24] Interview 14.09.2018

authorizes a court to review administrative action to guarantee it is fair, lawful and reasonable (RSA 2000b). Citizens that feel mistreated by administrative actions can challenge it based on the PAJA. Through an online forum, people can submit comments on issues (that she raises) that are then forwarded to the municipal government. The website furthermore provides information on the PAJA and highlights the importance of public participation[25]. In addition to the PAJA, public participation at the local level is legally mandated by the South African constitution (RSA 1996, ss 142 (e)) as well as by the Municipal System Act (32 of 2000) (RSA 2000a, ss 17).

DearCapeTown made use of and accelerated rightful participation procedures incorporated within the legal framework of the RSA. Through this channel, DearCapeTown enables a flow of information and exchange within the boundaries of Sandra's convictions, seeing as otherwise, citizens would not be able to create their own content and campaigns on the website. The flow of information and the deployment of knowledge contributes to the overall decision-making process. Knowledge constitutes an important tool for opinion formation and enables the exertion of power. Furthermore, due to it being an online-based participation platform, DearCapeTown excludes those citizens without an internet connection, a point which Sandra herself acknowledges in our interview. In that respect and due to the content of the campaigns, the initiative largely addressed middle-class homeowners that were identified to be the main addressees of communication campaigns of the CoCT during the crisis.

Infrastructure is the premise for and of the political, meaning infrastructure provides the platform for political exchange and is political in its very nature since it is constituted though precisely these negotiations. As I showed, social mobilisation in the context of service delivery can be studied from this perspective. Political action often takes place outside the visible public realm and normative conceptions, so that we must rethink political terrains and locations in society (von Schnitzler, 2013, p. 672). Infrastructure not only facilitates movement but also bears the risk of political and social inequality since the ones using it, especially in the context of the legacy of Apartheid, are in a privileged social position. In this sense, physical movement and social mobility are intertwined. Civic initiatives in South Africa dedicated to the mitigation of unequal access to infrastructure thus served to facilitate physical and social mobility.

Nevertheless, I'd like to focus the attention beyond this dualistic conceptualisation of either deprived or fortunate and highlight the productive features of infrastructure that evolved from the sense-making of urban governance by diverse urban dwellers during the water crisis in 2018. Especially during times of crisis and uncertainties, civic engagement increases throughout society, often due to strong governance intervention by state and local authorities. These interventions are at the centre of citizens' initiatives as they do not satisfy service provisioning and expectations that infrastructure promised. During the water crisis in 2018, citizens' initiatives occupied the space where municipal governments left a gap and thus integrated civil society in processes of public participation. On the grounds of various forms of dissatisfaction with the crisis management, citizens mobilised knowledge, ideas, and people. The disruption of the water infrastructure revealed functions and features of an otherwise rather boring system which became visible during a breakdown (Star, 1999, p. 378). It likewise uncovered gaps but also possibilities for public participation. Being part of the system of

[25] https://www.dearcapetown.co.za/ (website inactive; archive available here: https://web.archive.org/web/20190202210834/https://www.dearcapetown.co.za/)

infrastructure, they enable and improve social mobility, they mobilise ideas, knowledge, and people, and are mobile in their very nature since they are adaptive to their environment. These findings in the context of the temporary interference of water infrastructure call for further investigation of such citizens initiatives and their organisational structures, sustainability and resilience (Robins, 2019, p. 29), along with investigation of their ability to fill the gap where state and municipal provisioning proves insufficient and to create a space for grass-roots public participation.

4. Conclusion

The water crisis revealed that the system of infrastructure is not as mundane and unremarkable as it may seem to many middleclass homeowners on a typical day. While in many areas especially on the Cape Flats, water infrastructure has always been inconsistent, strenuous, and therefore evident, in middle class areas, infrastructure was rather inconspicuous. During the water crisis it provided the space for active negotiation processes and mobilised people around water access, distribution, and privatisation. By drawing attention to citizens' engagements during the disruption of water service delivery in Cape Town, this article has highlighted how these initiatives create spaces for active participation and are thus productive features of infrastructure. Focusing on self-organising citizens' initiatives and their ability to mobilise and steer ideas, knowledge, and information, we can better understand citizens' engagement with governing logics and their ability to constitute and reproduce themselves in the urban space.

The water crisis in Cape Town interfered the urban infrastructure in various ways and demonstrated its need for constant maintenance (Anand, 2015). It affected urban flows of water, people, their ideas, and information. While water was flowing more slowly and sometimes not at all, people circulated saving strategies, created awareness, and shared information. During the crisis, the establishment and mobilisation of various self-organising citizens' initiatives increased and took over the function of bridging civil society and local government. The initiatives created spaces for public participation and (re)claimed their right to the city and its infrastructure. They contribute to the maintenance or even restructuring of the urban water infrastructure and governance. While water infrastructure reproduces historically grown inequalities which we could specifically observe during the water crisis management, civic organisations took active countermeasures. In this sense, urban infrastructure systems are not only the condition for productivity but also their source. Including civic organisations and their ability to mobilise knowledge, ideas, and resources into the (water) infrastructure system helps us to understand its nature and nurture. Citizens' engagement, moreover, plays a vital role in the context of a democratic and inclusive understanding of urban governance. At the interface of civil society and local government, such initiatives can contribute to welfare and upward social mobility.

References

Amin, A., & Thrift, N. J. (2017). *Seeing like a city*. Cambridge, England, Malden, Massachusetts: Polity.

Anand, N. (2011). PRESSURE: The PoliTechnics of Water Supply in Mumbai. *Cultural Anthropology*, *26*(4), 542–564. https://doi.org/10.1111/j.1548-1360.2011.01111.x.

Anand, N. (2015). Accretion. Theorizing the Contemporary. Fieldsights, 24 September. https://culanth.org/fieldsights/accretion. Accessed 8 April 2019.

Appel, H., Anand, N., & Gupta, A. (2018). Introduction: Temporality, Politics, and the Promise of Infrastructure. In N. Anand, A. Gupta, & H. Appel (Eds.), *The promise of infrastructure: A School for Advanced Research advanced seminar* (pp. 1–38). Durham, London: Duke University Press.

Ashton, P., & Haasbroek, B. (2002). Water demand management and social adaptive capacity: A South African Case Study. In A. Turton, & R. Henwood (Eds.), *Hydropolitics in the developing world: A southern African perspective* (pp. 185–204). Pretoria: Univ., African Water Issues Research Unit.

Bénit-Gbaffou, C. (2008). Are practices of local participation sidelining the institutional participatory channels?: Reflections from Johannesburg. *Transformation: Critical Perspectives on Southern Africa*, *66*(1), 1–33. https://doi.org/10.1353/trn.0.0003.

Bickford-Smith, V. (1995). South African Urban History, Racial Segregation and the Unique Case of Cape Town? *Journal of Southern African Studies*, *21*(1), 63–78. https://www.jstor.org/stable/2637331.

Bourblanc, M. (2012). Transforming Water Resources Management in South Africa. Management Agencies' and the ideal of democratic development. *Journal of International Development*, *24*(5), 637–648. https://doi.org/10.1002/jid.2854.

Chase, S. E. (2011). Narrative Inquiry: Still a field in the making. In N. K. Denzin, & Y. S. Lincoln (Eds.), *The Sage handbook of qualitative research* (pp. 415–434). Los Angeles, Calif.: Sage.

Coates, R. (2019). Citizenship-in-nature? Exploring hazardous urbanization in Nova Friburgo, Brazil. *Geoforum*, *99*, 63–73. https://doi.org/10.1016/j.geoforum.2018.12.001.

CoCT - City of Cape Town (2012). *2011 Cencus - Cape Town*.

CoCT - City of Cape Town (2017a). *2017/2018 Tariffs, Fees and Charges*.

CoCT - City of Cape Town (2017b). Day Zero: when is it, what is it, and how can we avoid it?: Statement by the City's Executive Mayor, Patricia de Lille. http://www.capetown.gov.za/Media-and-news/Day%20Zero%20when%20is%20it,%20what%20is%20it,%20and%20how%20can%20we%20avoid%20it.

CoCT - City of Cape Town (2017c). *Five-year Integrated Development Plan*. Cape Town.

CoCT - City of Cape Town (2017d). *Installation of a water management device (WMD)*.

CoCT - City of Cape Town (2018). *Water Outlook 2018 Report*.

Currie, P. K., Musango, J. K., & May, N. D. (2017). Urban metabolism: A review with reference to Cape Town. *Cities*, *70*, 91–110. https://doi.org/10.1016/j.cities.2017.06.005.

DWAF - Department of Water Affairs and Forestry (1994). *Water Supply and Sanitation Policy - White Paper*.

DWAF - Department of Water Affairs and Forestry (2002). *Free Basic Water Implementation Strategy*.

DWAF - Department of Water Affairs and Forestry (2004). *Report of the Department of Water Affairs and Forestry: Annual Report 2004*.

DWAF - Department of Water Affairs and Forestry (2005). *Report of the Department of Water Affairs and Forestry: Annual Report 2005*.

Earle, A., Goldin, J., & Kgomotso, P. (2005). Domestic Water Provision in the Democratic South Africa – changes and challenges. *Nordic AfricaInstitute's Conflicting Forms of Citizenship Programme*.

Funke, N., Nortje, K., Findlater, K., Burns, M., Turton, A., Weaver, A., & Hattingh, H. (2007). Redressing Inequality: South Africa's New Water Policy. *Environment: Science and Policy for Sustainable Development*, *49*(3), 10–23. https://doi.org/10.3200/ENVT.49.3.10-25.

Gowlland-Gualtieri, A. (2007). *South Africa's Water Law and Policy Framework: Implications for the Right to Water*. Geneva.

Hall, K., Leatt, A., & Monson, J. (2006). Accommodating the poor: The Free Basic Water policy and the Housing Subsidy Scheme. *South African Child Gauge*, 57–62.

Harris, L. M., Kleiber, D., Rodina, L., Yaylaci, S., Goldin, J., & Owen, G. (2018). Water Materialities and Citizen Engagement: Testing the Implications of Water Access and Quality for Community Engagement in Ghana and South Africa. *Society & Natural Resources*, *31*(1), 89–105. https://doi.org/10.1080/08941920.2017.1364818.

Harvey, D. (2003). The right to the city. *International Journal of Urban and Regional Research*(27.4), 939–941.

Harvey, P. (2018). Infrastructures in and out of Time: The Promise of Roads in Con temporary Peru. In N. Anand, A. Gupta, & H. Appel (Eds.), *The promise of infrastructure: A School for Advanced Research advanced seminar* (80-101). Durham, London: Duke University Press.

Hellberg, S. (2014). Water, life and politics: Exploring the contested case of eThekwini municipality through a governmentality lens. *Geoforum*, *56*, 226–236. https://doi.org/10.1016/j.geoforum.2014.02.004.

Hellberg, S. (2018). *The biopolitics of water: Governance, scarcity and populations.* Earthscan studies in water resource management. London, New York: Routledge Taylor & Francis Group.

Holm, A. (2011). Das Recht auf die Stadt. *Blätter für deutsche und internationale Politik*, *8*, 89–97.

International Conference on Water and the Environment (1992). The Dublin Statement and Report of the Conference: Dublin Statement on Water and Sustainable Development.

Joubert, L., & Ziervogel, G. (2019). *Day Zero: One city's response to a record-breaking drought*.

Kotze, P. (2010). Cape Town - water for a thirsty city (part 1): urban water supply. *Water Wheel*, *9*, 27–29.

Larkin, B. (2013). The Politics and Poetics of Infrastructure. *Annual Review of Anthropology*, *42*(1), 327–343. https://doi.org/10.1146/annurev-anthro-092412-155522.

Lasswell, H. D. (1960). *Politics: Who gets what, when, how.* (3rd ed.). New York: Meridian Books.

Lindón, A. (2013). Urbane Geographien des alltäglichen Lebens. In A. Huffschmid, & K. Wildner (Eds.), *Stadtforschung aus Lateinamerika* (pp. 59–79). Bielefeld: transcript Verlag.

Mahlanza, L., Ziervogel, G., & Scott, D. (2016). Water, Rights and Poverty: an Environmental Justice Approach to Analysing Water Management Devices in Cape Town. *Urban Forum*, *27*(4), 363–382. https://doi.org/10.1007/s12132-016-9296-6.

Marcus, G. E. (1995). Ethnography in/of the World System: The Emergence of Multi-Sited Ethnography. *Annual Review of Anthropology*, *24*(1), 95–117. https://doi.org/10.1146/annurev.an.24.100195.000523.

McDonald, D. A., & Pape, J. (Eds.) (2003). *Cost recovery and the crisis of service delivery in South Africa*. London: Zed.

Meissner, R., Funke, N., Nortje, K., & Steyn, M. (Eds.) (2019). *Understanding Water Security at Local Government Level in South Africa*. Cham: Springer International Publishing.

Muller, M. (2007). Parish pump politics: the politics of water supply in South Africa. *Progress in Development Studies*, *7*(1), 33–45. https://doi.org/10.1177/146499340600700104.

Muller, M. (2019). Some systems perspectives on demand management during Cape Town's 2015–2018 water crisis. *International Journal of Water Resources Development*, 1–19. https://doi.org/10.1080/07900627.2019.1667754.

Narsiah, S. (2013). Neoliberalism as spatial fix: An example from South Africa. *Geoforum*, *45*, 136–144. https://doi.org/10.1016/j.geoforum.2012.10.011.

Robins, S. (2019). 'Day Zero', Hydraulic Citizenship and the Defence of the Commons in Cape Town: A Case Study of the Politics of Water and its Infrastructures (2017–2018). *Journal of Southern African Studies*, *45*(1), 5–29. https://doi.org/10.1080/03057070.2019.1552424.

Rodina, L., Harris, L. M. (2016). Water Services, Lived Citizenship, and Notions of the State in Marginalised Urban Spaces: The case of Khayelitsha, South Africa. *Water Alternatives*, *9*(2), 336–355.

RSA - Republic of South Africa (1950). *Group Areas Act*.

RSA - Republic of South Africa (1996). *The Constitution of the Republic of South Africa: No. 108 of 1996*. Pretoria.

RSA - Republic of South Africa (1998). *National Water Act No.36: RSA*.

RSA - Republic of South Africa (2000a). *Local Government: Municipal Systems Act 32 of 2000*. Cape Town.

RSA - Republic of South Africa (2000b). *Promotion of Administrative Justice Act*. Cape Town.

Rule, S., Parker, S., Lunga, W., & Majikijela, Y. (2020a). Drought disaster management: Lessons from the Western Cape. *Policy Brief*, 1–4.

Rule, S., Parker, S., Majikijela, Y., & Lunga, W. (2020b). Neighbourhood responses to drought in the Western Cape. *GeoJournal*. https://doi.org/10.1007/s10708-020-10185-5.

Simone, A. (2004). People as Infrastructure: Intersecting Fragments in Johannesburg. *Public Culture*, *16*(3), 407–429.

Sorensen, P. (2017). The chronic water shortage in Cape Town and survival strategies. *International Journal of Environmental Studies*, *74*(4), 515–527. https://doi.org/10.1080/00207233.2017.1335019.

South African Cities Network (2016). *State of South African cities report, '16*. Braamfontein: South African Cities Network.

Star, S. L. (1999). The Ethnography of Infrastructure. *American Behavioral Scientist*, *43*(3), 377–391. https://doi.org/10.1177/00027649921955326.

Stein, R. (2002). Water sector reforms in Southern Africa: Some case studies. In A. Turton, & R. Henwood (Eds.), *Hydropolitics in the developing world: A southern African perspective* (pp. 113–123). Pretoria: Univ., African Water Issues Research Unit.

Swyngedouw, E. (2011). Metabolic urbanization: the making of cyborg cities. In N. C. Heynen, M. Kaika, & E. Swyngedouw (Eds.), *In the nature of cities: Urban political ecology and the politics of urban metabolism* (pp. 21–40). London, New York: Routledge.

The South African Civil Society Information Service (2014). 'Protest Nation': What's Driving the Demonstrations on the Streets of South Africa?: Interview with T. Ngwane, SACSIS, Johannesburg. http://sacsis.org.za/site/article/1930.

Thompson, L. (2014). Agency and Action: Perceptions of Governance and Service Delivery among the Urban Poor in Cape Town. *Politikon*, *41*(1), 39–58. https://doi.org/10.1080/02589346.2014.885672.

Tshoose, C. (2017). Dynamics of public participation in local government: a South African Perspective . *African Journal for Public Affairs*, *8*(2), 13–29.

Turton, A., & Henwood, R. (Eds.) (2002). *Hydropolitics in the developing world: A southern African perspective*. Pretoria: Univ., African Water Issues Research Unit.

Turton, A., & Meissner, R. (2002). The hydrosocial contract and its manifestation in society: A South African case study. In A. Turton, & R. Henwood (Eds.), *Hydropolitics in the developing world: A southern African perspective* (pp. 37–60). Pretoria: Univ., African Water Issues Research Unit.

UN WWAP - UN World Water Assessment Programme (2006). *Water a shared responsibility.* The United Nations world water development report / United Nations 2. Paris, New York: Unesco Publ; Berghahn Books.

van Vuuren, L. (2012). *In the footsteps of giants: Exploring the history of South Africa's large dams.* WRC report, SP 31/12. Gezina, South Africa: Water Research Commission.

Visser, W. P. (2018). A perfect storm: The ramifications of Cape Town's drought crisis. *The journal for Transdisciplinary Research in Southern Africa*, *14*(1), 1–10. https://td-sa.net/index.php/td/article/view/567. Accessed 19 May 2019.

von Schnitzler, A. (2013). TRAVELING TECHNOLOGIES: Infrastructure, Ethical Regimes, and the Materiality of Politics in South Africa. *Cultural Anthropology*, *28*(4), 670–693. https://doi.org/10.1111/cuan.12032.

von Schnitzler, A. (2016). *Democracy's infrastructure: Techno-politics and protest after apartheid.* Princeton studies in culture and technology. Princeton, Oxford: Princeton University Press.

von Schnitzler, A. (2018). Infrastructure, Apartheid Technopolitics, and Temporalities of "Transition". In N. Anand, A. Gupta, & H. Appel (Eds.), *The promise of infrastructure: A School for Advanced Research advanced seminar* (pp. 133–154). Durham, London: Duke University Press.

Western Cape Economic Development Partnership (2018). Cape Town Drought Timeline 2014-2018. https://cdn.knightlab.com/libs/timeline3/latest/embed/index.html?source=1WAVNeLOMvctf3CgipLmCxXF_E7tl15jgTmG7XCefYMI&font=Default&lang=en&initial_zoom=2&height=650. Accessed 23 October 2019.

Wilkinson, P. (2000). City profile Cape Town. *Cities*, *17*(3), 195–205.

World Bank (2004). *Water Resources Sector Strategy: Strategic Directions for World Bank Engagement*. DC: Washington.

Ziervogel, G., Shale, M., & Du, M. (2010). Climate change adaptation in a developing country context: The case of urban water supply in Cape Town. *Climate and Development*, *2*(2), 94–110. https://doi.org/10.3763/cdev.2010.0036.