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# Beyond Day Zero

## Tracing the Institutional Framing of Water Scarcity in Cape Town

Author: Wilma Engkvist

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Supervisor: Erik Brattström

## *Abstract*

Growing concerns around resource depletion and climate change has made freshwater scarcity an increasingly urgent issue for cities around the world. In Cape Town, this became especially visible during the 2018 Day Zero crisis, when the City of Cape Town faced the possibility of its municipal water supply systems reaching a critical failure point. This thesis examines how freshwater scarcity in Cape Town has been framed within public institutions over time. Focusing on five official City of Cape Town documents published between 2018 and 2025, the study uses reflexive thematic analysis and framing theory to analyse shifts in institutional discourse following the drought crisis. The analysis identifies a shift from framing water scarcity as an immediate crisis requiring behavioural compliance toward a broader understanding of water scarcity as a long-term governance and resilience challenge. The analysis is structured by four themes: the shift from emergency to permanent governance risk, the shift from behavioural compliance to collective adaptive governance, the institutionalism of climate uncertainty, and the framing of water scarcity as a systemic urban resilience challenge. The findings show that crisis language does not disappear, but rather used as a reference point for future preparedness. Similarly, behavioural compliance from residents shifts and residents remain part of the responsibility framework, but the City takes on a bigger role in planning, infrastructure, diversification, and long-term governance. The thesis argues that institutional framing matters because it shapes how water scarcity is understood, who is positioned as responsible, and what responses appear necessary and legitimate.

*Key Words:* water scarcity; framing; water governance; Cape Town; Day Zero; climate uncertainty; resilience

*Word Count:* 13.589 words

## *Table of Contents*

# *1. Introduction*

## *1.1 Introduction and Background to Research Area*

Water scarcity is a global problem that is growing and driven by population growth, urbanisation, and climate change (Koop & van Leeuwen, 2017; Lindqvist et al., 2021; Matimolane & Mathivha, 2025). Cape Town's almost 'Day Zero' drought crisis illustrates the vulnerabilities of rural and urban water systems (Matimolane & Mathivha, 2025). The issue of water scarcity is increasingly being framed as more than just a physical shortage of water, but as a governance crisis in need of greater coordination and developed policy adaptation (Matimolane & Mathivha, 2025; Koop & van Leeuwen, 2017). Increased framing of water scarcity as not just an issue of environment but of politics, economics, and social justice, highlights the importance of examining how water scarcity is framed (Koop & van Leeuwen, 2017; Lindqvist et al., 2021; Matimolane & Mathivha, 2025).

However, water scarcity is part of a bigger issue. For over half a century, humanity has operated under a 'predominant paradigm' of development that remains largely oblivious to biophysical risks, clinging to the neoclassical myth that man-made capital can substitute for any natural resource (Meadows et al., 1972; Ayres, 2007; Rockström et al., 2009). However, realisation that Earth's resources are finite is vital to maintain the possibility of a thriving Earth even long in the future, as the longer humanity avoids accountability and continuously exhausts Earth's resources it is causing the trade-offs (e.g. environmental degradation, climate change, public health, and geopolitical conflict), to become increasingly unresolvable. In 1972, Meadows et al, concluded that there was a 100 year window in which, if humanity had kept the growth trends in pollution levels, resource depletion, world population, and food production of 1972 unchanged, a global equilibrium could have been reached through international, and national efforts. 40 years later data showed that instead of acting to slow down the exhaustion of natural resources such as freshwater, minerals and metals, fossil fuels, and agricultural lands, the world kept going as "business-as-usual", and the scenario predicted by this in 1972 is tracking almost perfectly (Turner, 2014). Meaning that resource depletion is probable to occur within the 21st century (Meadows et al., 1972; Turner, 2014). With that comes economic consequences, as when resources such as minerals and oil become limited and harder to reach, the price for extraction will see a drastic increase, causing industry and agriculture to suffer (Meadows et al., 1972; Turner, 2014).

Another way to conceptualise Earth's finiteness is through understanding its planetary boundaries and how human behaviour has shifted the state of Earth. Rockström et al. (2009) describe the effect humans have had on our planet by using the geological epochs Holocene,

which has a relatively warm and stable climate. And Anthropocene, an epoch where human activity has become the dominant force impacting Earth's climate and ecosystems. In order to fully understand the planetary boundaries of Earth it is important to understand the difference of threshold, a non-linear transition connected to human-environment systems, and boundaries, which are values humans have put at a safe distance from dangerous levels. The real issue now is not resources being fully exhausted but rather crossing the biophysical thresholds which can trigger irreversible changes to Earth' s climate and ecosystems. Three of these thresholds had already been crossed as of 2009, climate change, biodiversity loss, and the nitrogen cycle (Rockström et al., 2009).

One of Earth's resources that has limited technological or human-made substitutes is freshwater. These substitutes such as desalination of salt water, are often expensive both financially and energy wise, and despite that they can be useful in water shortages; they are not feasible long-term solutions (Meadows et al., 1972).

The results of this thesis show that water depletion has become an issue that is becoming more integrated into policy within the City of Cape Town and is increasingly being framed as a long-term issue rather than a temporary crisis situation.

### *1.2 The Context of Cape Town*

In the years 2015 to 2017 Cape Town suffered its driest period in almost a hundred years, metrics show that a drought this severe probably will not occur again for 300 years (City of Cape Town, 2018). In a city that primarily relied on surface water from rainfall it made Cape Town very vulnerable (City of Cape Town, 2019). In late 2016 the City of Cape Town (CCT) emphasised the severity of the water scarcity and the reality of how the future of the water scarcity was increasingly worrisome. In November of 2017 the worries had become reality as dam levels dropped to approximately 20%, causing city officials to start thinking of a possible Day Zero event, where taps could be turned off and enforced citywide rationing would take place (Millington & Scheba, 2021). The proposed Day Zero would occur if the dam levels sank to 13.5%, which was projected in mid-May 2018 (City of Cape Town, 2018; Millington & Scheba, 2021). In January of 2018, the city introduced new tariffs on water, capping residents' water use to 87 litres per person per day, this however quickly sank to 50 litres per person per day (Millington & Scheba, 2021). These restrictions on water use lasted for eight months (Millington & Scheba, 2021). Despite the restrictions no longer being implemented, the citizens of Cape Town continued with water-saving and efficiency

behaviours throughout 2018 and into 2019, with projections of water consumption to not likely return to pre-drought levels (City of Cape Town, 2019).

Following this the City created water outlook reports – strategic planning documents that evaluate the city's water security, assess dam levels and track infrastructure projects – in early 2018, which since has been updated regularly, starting with every couple of months in 2018 to approximately one every year since then. CCT also accepted their first water strategy and resilience strategies in 2019, these provided adaptive frameworks designed to shift the city from crisis response to long-term climate adaptation and water security.

### *1.3 Significance of the Study*

Water Scarcity is a global issue that affects millions of people every year. Existing research already shows that water scarcity is more than a hydrological or technical problem, and has been studied as a governance issue, climate risk, and as a social justice issue (Head, 2010; OECD, 2015; Koop & van Leeuwen, 2017; OECD, 2021; Matimolane & Mathivha, 2025). Existing literature also examines water scarcity narratives and their ability to depoliticise scarcity and shift blame (Lazaro et al. 2023). The case of Cape Town is a useful case as Day Zero provides a recent and well documented example of urban water scarcity, as well as a clear basis for examining water scarcity across periods. Furthermore, it is useful for an analysis of how institutional discourse shifts after a severe water crisis and how it becomes connected to responsibility, governance, and resilience. Nevertheless, less attention has been paid to how a public institution's framing of water scarcity changes over time after a severe water crisis, such as the 2018 drought in Cape Town. While previous research often focuses on the crisis itself, public behaviour during a crisis, or broader governance frameworks developed in response to crisis, this thesis focuses on official institutional discourse across several moments in time: during crisis, post-crisis, transitional period, and long-term water scarcity planning.

This thesis addresses a gap in research on post-crisis institutional framing over time by examining how the City of Cape Town's official documents frame water scarcity across crisis, post-crisis, and long-term planning periods. This is especially relevant as institutional framing shapes how scarcity is understood, who is expected to respond, and how institutions justify and prioritise future action.

### *1.4 Aim and Research Question*

The aim of this paper is to, through a reflexive thematic analysis of policy documents along with other government documents such as strategy documents and reports, examine whether or not there has been a shift in the discourse of how the City of Cape Town approaches the issue of increasing water depletion. As well as if or how mitigation and response to this issue has shifted to better work within the new normals or create long-term mitigation efforts rather than short-term to hopefully slow down the process further.

With climate change rising and vulnerable water management systems the 2018 drought in Cape Town became a severe crisis event, due to Cape Town's reliance on rainwater fed dams and three consecutive very dry years the dam levels reached critical levels, causing the possibility of a Day Zero event, opened for discussions about diversification of water sources (City of Cape Town, 2018). So while water scarcity is affected by climate change, population growth, and competing actors (e.g. industries, ecosystems and households), it is also affected by social, economic, and political factors. As well as a question of governance, how should the future of water scarcity be planned for and who is responsible or framed as being responsible for conserving water in a time when more water cannot be assumed to be available. So, CCT's over-reliance on rainwater fed dams as main water source and their shift towards diversification show that Cape Town is dealing with resource limits and creates an opportunity to examine changing framing of water scarcity within official CCT documents over time.

The research question is therefore:

"How has freshwater scarcity in Cape Town been framed within public institutions over time?"

### *1.5 Delimitations*

The thesis considered three delimitations. The first, the geographical focus on Cape Town, second, the temporal focus from 2018 through 2025, and finally, the limited number of documents. The geographical focus on Cape Town was chosen as the city had semi-recently experienced a water crisis, almost ending in a Day Zero event, where the water levels would be so low that taps would run dry or have to be turned off and rationing would be enforced (Millington & Scheba, 2021). The crisis having occurred within the last 10 years provided the opportunity to examine a recent and well-documented case of how public institutions frame water scarcity in the years following a severe drought. Furthermore, the CCT documents, the February 2018 Water Outlook, the 2019 resilience strategy, the 2019 water strategy, the 2020

Water Outlook, and the 2025 Water Outlook, being available through the City's public document archive, and their availability in English also made it possible to trace shifts in institutional framing from crisis period to later post-drought planning. Attention was brought to the case of Cape Town due to the 2018 Day Zero crisis becoming internationally recognised as an example of urban water scarcity, making it a highly relevant case for examining water scarcity framing.

The temporal focus of 2018 through 2025 was chosen as the Day Zero crisis provides a clear turning point from which later shifts in CCT's framing of water scarcity can be examined. Covering the immediate crisis of the drought, the post-crisis strategic period, and later long-term water governance. Allowing for comparison between emergency discourse and resilience and governance discourse.

Finally, the limited number of documents used within the analysis was a conscious choice given the restricted time available to perform this thesis. The five official CCT documents are the February 2018 Water Outlook, the 2019 resilience strategy, the 2019 water strategy, the 2020 Water Outlook, and the 2025 Water Outlook. These documents cover different moments in the crisis and post-crisis timeline. The water outlooks provide an opportunity to compare across time given that they are the same type of document but produced in different years, this makes it easier to trace shifts in language and framing and helps comparison of crisis, transitional, and post-crisis discourse. The strategies compared to the water outlooks provide a broader institutional meaning, being more vision oriented than technical which provides additional analytical depth. However, other documents were considered, such as water services development plans, integrated development plans and state of the environment reports. While these documents could have been useful in providing a broader perspective and possibly background context but not as suitable for a direct focus on CCT's institutional framing of water scarcity governance. The state of the environment report does provide some insight on water scarcity but the main focus remains on broader environmental monitoring. This would have broadened the scope and shifted the analysis to a more general environmental reporting with the addition of having to sort through several other areas of municipal development. So excluding these documents keep the dataset focused and more manageable for close reflexive thematic analysis,

### *1.6 Disposition of Thesis*

The thesis will start with introducing background information on the general issue of resource depletion before moving into the context of Cape Town. Following this, a research

overview provides insights on; changing understandings of scarcity; water governance, accountability, and shared responsibility; and water scarcity, uncertainty, and systemic resilience in previous literature. Framing theory as the theoretical perspective is next. Followed by the method of the analysis, where reflexive thematic analysis is explained and the specific analytical steps, such as data collection, coding process, and theme development are provided. This is followed by the results of the analysis before moving into a discussion of the findings. Finally, a conclusion with a summary of the thesis findings, their analytical meaning and an answer to the research question will complete the thesis.

## *2. Research Overview*

The thesis will now provide an overview on existing literature in relation to the changing understandings of water scarcity, governance accountability, accountability, and shared responsibility in water governance, and water scarcity, uncertainty, and systemic resilience.

### *2.1 Framing research in relation to water scarcity*

Lazaro et al. (2023) examines water scarcity narratives in Brazil, noting that water scarcity is among the most urgent issues of our time, with over 50 percent of the population experiencing water scarcity for about a month annually, a number which continues to increase with each passing year. Adding that in many cases, scarcity is aggravated by poor management and limited governance as well as scarcity in sectors such as the energy sector and food production sector. But an increasing understanding of the challenges involved in water resource management, such as hydro-politics and water-sensitive urban design, has shown that water scarcity is more than a purely technical issue (Lazaro et al., 2023). Instead Hidalgo-Bastidas and Bolens (2019) see the similarities between scarcity and overabundance, that they are not just technical or physical but rather are techno-political and naturalised constructs. Meaning that while they might be presented to be natural or purely technical, they are also shaped by social factors and political decisions and priorities. In Brazil for example, scarcity narratives are not neutral, but guide decisions and can be used to legitimize development interventions or prevent policy change (Lazaro et al., 2023). These narratives are used to downplay the issue of scarcity within Brazil through narratives of Brazil as a water abundant country, even though a majority of said abundance is utilised within the Amazon ecosystem. While framing emphasises mismanagement of water as a cause of scarcity, narratives also shift the blame or responsibility away from local governments and

onto broader causal factors like climate change and other factors that lay beyond the direct control of the local governments (Lazaro et al., 2023). Similarly, Hussein's (2019) analysis of framings of water scarcity in Jordan's water strategy reveal that despite that the later revised strategy has adopted global discourse on sustainability (e.g. sustainable use of groundwater) the technical engineering focus remains rather than addressing the issues of access and responsibility. This reflects a trend of using water as a tool to shape public perception by ensuring that certain causes, responsibilities, and solutions appear more legitimate than others (Hidalgo-Bastidas & Bolens, 2019).

The analysis by Lazaro et al. (2023) on Brazil's water scarcity narratives show that narratives and framing can be utilised to shape public responses and social perceptions while guiding the decision-makers regulation of water based on public interest. As well as be used to downplay the severity of scarcity and shift the responsibility (Lazaro et al., 2023). Meanwhile, Hussein's (2019) analysis of water scarcity framings in Jordan shows that sustainability language and global discourse can be adopted without effectively changing the approach or suggested solutions from before adoption, making it possible for policy documents to seem more progressive while maintaining a largely technical approach. Hidalgo-Bastidas and Bolens (2019) analysis of political construction of rural-urban flood-risk politics in Ecuador show that water-related issues can be naturalised. For example, how presenting water scarcity as a drought shifts the perceived meaning to guide the reader to believe it is due to natural causes, such as low rainfall, rather than see it as an issue of distribution (Hidalgo-Bastidas & Bolens, 2019). Shifting the attention away from political decisions and toward climate change, reduced rainfall and climate uncertainty.

### *2.2 Framing Water Scarcity as a Social and Development Issue*

This study treats water scarcity as more than simply an environmental or technical problem, it is analysed as an inherently social problem that is shaped by public institutions, discourse, inequality, and governance. The focus lies on how CCT documents construct responsibility, risk, and solutions in response to water scarcity, as these were common themes that appeared throughout all five documents.

Existing research frames water scarcity as a complex governance problem that involves climate uncertainty, ecological sustainability, infrastructure, social equity, public trust, institutional responsibility, long-term resilience, and economic trade-offs. Head (2010) mentions this tendency in water policy to shift from being understood as a technological or economic issue, toward being understood as a complex issue involving competing social interests, ecological sustainability, and institutions. Viewing water scarcity through this lens

of complexity emphasises its sociological aspects, as this shows that it is not only rainfall or dam levels that shape it, but also public behaviour, political priorities, social organisation, and decision-making. The OECD Toolkit (2021) furthers the social aspects of water scarcity as it discusses how water governance depends on clear roles and responsibilities across national and local authorities. As these authorities and public institutions not only manage water materially but also communicate risk, and through this communication also shape public understanding.

Furthermore, the UN *Water Bankruptcy report* highlights water availability and quality in relation to public health, human security, and social and political stability. It also emphasises that water is a foundation for human development and planetary stability, and the fact that there is a need for recognition of water as an upstream opportunity sector in which investments have a long-term impact and benefits for stability, health, environment, and security. As water quality directly impacts food safety and health (Madani, 2026a
).

This makes it relevant to analyse CCT's documents not only as management texts, but also as institutional texts that frame scarcity as a social and governance problem.

### *2.3 Changing Understandings of Water Scarcity: From Stress to Crisis and Long-Term Resilience*

Water scarcity can be defined as a situation in which there is insufficient water to support human water needs and ecosystem water needs simultaneously (Bond et al., 2019). In this situation there comes the need to prioritise how to allocate water, whether it should be reserved for the ecosystems to counteract biodiversity loss, or human uses such as drinking water, agriculture, and economic activity, or balanced (OECD, 2021).

Traditionally water issues, such as scarcity and limited supply, have been regarded within a technology paradigm, seen as mainly a technological and infrastructure issue (Head, 2010; Krueger et al., 2025). However, this understanding has become less sufficient as water scarcity has increasingly been linked to ecological sustainability, competing social interests, institutional capacity, and long-term risk. Earlier approaches to water scarcity often emphasised physical supply, infrastructure, and demand pressures, while more recent literature increasingly understands scarcity as a broader governance and resilience challenge (Head, 2010; Verre, 2026). In sum, the shift in the overall water governance literature shows how scarcity can move from being understood as a technical supply problem, to being framed as a crisis or risk that requires broader governance responses.

Scarcity has not only become a more complex issue because of a broader understanding of its drivers, but also because of climate change, and changing societal changes such as population growth, economic growth, competing users (e.g. ecosystems, households and industries), and environmental degradation, all of which increase the need for broader governance responses (Head, 2010; OECD, 2021; Verre et al., 2026). With this changing understanding of water scarcity it has moved from being an issue that is managed to one that is planned for as a future condition, especially with climate change increasing the probability of water scarcity all over the world, even in countries that are considered as relatively water abundant (OECD, 2021). This means that even the overall planning for water scarcity has shifted from being fixed to adaptive as to not rely on outdated assumptions about rainfall, demand, and future water availability. The UN *Water Bankruptcy report* argues that in this time with increasing water scarcity world wide, the usual crisis language might no longer be sufficient on its own to describe the long-term and structural nature of contemporary water insecurity (Madani, 2026a). Proposing the term 'Water Bankruptcy' to describe a post-crisis state in which the human-water system has been used beyond hydrological means for such an extended period of time that there is no longer any way to utilise it to the same extent without causing irreversible damage to nature (Madani, 2026b). Applying this term can shift the discourse from seeing scarcity as an emergency or temporary crisis and rather seeing it as a long-term condition.

### *2.4 Water Governance, Accountability, and Shared Responsibility*

Clarifying roles and responsibilities is central to water scarcity management, as water scarcity demands the attention of several actors and levels of decision-making, if the responsibilities are not clear it is easy for them to become blurred, particularly in relation to communication, infrastructure maintenance, and protection of vulnerable communities. This is especially important as water governance often involves multi-level governance with national, regional, and local authorities, which emphasises the necessity of coordination across levels (OECD, 2015; OECD, 2021). Water governance can be defined as "the social function that regulates development and management of water resources and provisions of water services at different levels of society and guiding the resource towards a desirable state and away from an undesirable state" (Pahl-Wostl, 2015, p. 26). Within this definition, water scarcity management can be seen as a sub-function, with general water management described as the activities of monitoring water resources and implementation of measures to keep water resources within bounds (Pahl-Wostl, 2015). So, water scarcity management

would take the form of implementing measures to keep water resources within bounds and remain sustainable despite environmental extremes and uneven distribution.

While public authorities have a central role, effective water scarcity governance also depends on the involvement of residents, businesses, institutions, and stakeholders through communication, participation, and shared responsibility (Head, 2010; OECD, 2015; OECD, 2021). Residents and businesses directly influence water demand, and water use efficient behaviour can help manage water consumption, institutions should conduct risk assessments, providing guidelines and standards in regulatory policies, stakeholder engagement can improve acceptability and sustainability, ownership of decision, social equity and cohesion, information sharing, and economic efficiency (OECD, 2021). However, shared responsibility should not mean that the responsibility becomes unclear, because while residents and businesses influence demand, institutions remain those responsible for planning, regulations, communication, and infrastructure (OECD, 2015; OECD, 2021). In addition to this water governance has become even more complex in light of climate uncertainty, ecological sustainability, and institutional change, requiring plans that are adaptable to changing conditions (Head, 2010; OECD, 2021).

While the OECD Principles (2015) and Toolkit (2021) provide a governance framework focused on roles, responsibility, coordination, and stakeholder engagement, Head (2010) helps explain why such governance has become increasingly complex.

### *2.5 Water Scarcity, Uncertainty, and Systemic Resilience*

Water scarcity is increasingly discussed in the literature as a complex governance and resilience challenge shaped by climate uncertainty, infrastructure, institutions, and social vulnerability rather than only as a question of physical water availability (OECD, 2021; Krueger et al., 2025; Madani, 2026a; Verre et al., 2026). Water challenges affect the availability of clean water and sanitation, limited access to water tends to turn focus away from water quality and onto immediate response to obtain a higher quantity of water instead (Madani, 2026a). This has a direct impact on the ability to achieve not only Sustainable Development Goal 6 (ensuring safe water and sanitation for all), but is also consequential for achieving other global agendas and development goals, and the rising issue of climate change further intensifies this challenge (OECD, 2021; United Nations, n.d.). Previously predictable rainfall patterns are becoming increasingly difficult to predict accurately due to a changing climate, this in turn influences predictions of future supply and pressures for a water governance with new strategic directions (Head, 2010). Water scarcity is not only a

technological issue but also affects public health, food safety, ecosystems, energy, livelihoods, and both social and political stability (Madani, 2026a).

With climate and rainfall uncertainty becoming an increasingly recurring and important factor, it has become more frequently incorporated into long-term water management planning to account for future water availability, demand, and climate-related risk (OECD, 2021). Because uncertainty is now central in water governance, planning must become adaptive rather than fixed, utilising risk assessment, data, scenario planning, and flexible combinations of supply-side and demand-side strategies (Head, 2010; OECD, 2021; Krueger et al., 2025). The UN *Water Bankruptcy report* foresees a world increasingly shaped by widespread water bankruptcy and argues that water governance must combine mitigation with adaptation to new hydrological and environmental conditions (Madani, 2026a). In this sense, adaptive planning can be understood as a preventative governance approach that seeks to avoid the kind of long-term overshoot, depletion, and irreversible degradation, from which water can no longer be replenished, as described in the water bankruptcy framework.

While these sources agree that water scarcity is no longer only a question of physical water availability, they approach this complexity from different perspectives. Head (2010) contributes an understanding of uncertainty especially in regard to historical rainfall patterns, with a general focus on uncertainty and policy learning. Whereas Verre et al. (2026) has a multidimensional scarcity perspective, that emphasises that scarcity is dynamic, and shaped by political, social, economic, environmental, technological, and governance factors. OECD (2021) utilises a practical policy perspective and focuses on how to manage water uncertainty through planning processes, risk assessment, data, and policy coherence. Madani (2026a) instead has a systemic risk and post-crisis perspective on water governance, he focuses on the limits of crisis language and the danger of assuming that returning to ‘normal’ levels will always be possible. Krueger et al. (2025) applies an urban resilience perspective which emphasises that resilience is multidimensional and depends on interactions between actors such as people, institutions, ecosystems, and infrastructure, rather than just infrastructure on its own.

## *3. Theoretical Framework*

This section will present and discuss the theoretical framework that will be used in the study: framing theory. The framework is used to analyse shifts in how water scarcity is constructed in official City of Cape Town documents between 2018 and 2025. Rather than treating these documents as neutral descriptions of water conditions, framing theory makes it

possible to examine how particular meanings, responsibilities, risks, and solutions are emphasised over time (Entman, 1993, p. 52).

The theoretical framework used within this study aligns well with the methodological approach of reflexive thematic analysis, as both are concerned with meaning-making and interpretation (Entman, 1993, pp. 52-53 ; Braun & Clarke, 2019, pp. 591-593). While thematic analysis is used to identify patterns across the documents, framing theory helps interpret what the patterns reveal about how water scarcity is presented as both a public and institutional problem. This will prove to be especially relevant in the context of Cape Town's 2015-2017 dry period and the threat of Day Zero in 2018, as this became an important moment in which the City's communication around water scarcity became more clear and visible.

### *3.1 Framing Theory*

Framing theory provides a useful lens for analysing how public institutions construct, communicate, and give meaning to policy problems. Framing involves selection and salience, selecting certain aspects of reality and ensuring they are more salient in the text; this is often used as a way to highlight a specific problem definition, causal interpretation, moral evaluation, or make suggestions. All four of these functions could be present in a single sentence, however, a lot of sentences may not use any of them, and the frames themselves may not utilise all of these functions all the time (Entman, 1993, p. 52).

Frames can shape how a problem is understood by diagnosing causes, evaluating consequences, and suggesting possible responses. In texts, frames or framing appear through language, including the use of keywords, phrases, tone, and patterns of emphasis. Although frames may guide how readers interpret an issue, the interpretation of a frame does not necessarily reflect the author's exact intention (Entman, 1993, p. 52).

Within this thesis framing theory will be used as an analytical lens to help interpret patterns that are found through reflexive thematic analysis. It will be utilised to examine crisis, risk, governance, and resilience as well as to see what causes are emphasised in the documents, is it drought, climate change, and population growth, all causes outside of immediate control, or is it demand, governance, and infrastructure. So, rather than treating the documents as neutral descriptions of water scarcity, the analysis will consider how scarcity is defined, who is assigned responsibility, what solutions are proposed, and how they approach planning for the future.

## *4. Methodology*

### *4.1 Research Design*

The study employed a qualitative approach to document analysis in combination with reflexive thematic analysis with the purpose to examine water scarcity framing over time within the City of Cape Town's official documents.

Reflexive Thematic Analysis (reflexive TA) provides a flexible framework to interpret patterns of meaning within qualitative data. Since TA is not bound to a specific theoretical framework it can be used both inductively and deductively, and its emphasis on researcher reflexivity and interpretive depth provides opportunities for rich conceptual analysis across topics (Braun & Clarke, 2019; Ahmed et al., 2025).

Reflexive TA is often executed through six phases; Phase 1 is to become familiarized with the data, Phase 2 is the generation of initial codes, Phase 3 is to search for themes, Phase 4 is to review the themes, Phase 5 is to define and name the themes, and finally Phase 6 is to write the report (Ahmed et al., 2025).

### *4.2 Data material and document selection*

The data used in this process consists of five official City of Cape Town documents, three different editions of the *Water Outlook* report, and two strategy documents. The three editions of the *Water Outlook* report are the 2018 *Water Outlook* report that was last updated in February of 2018, the October 2020 *Water Outlook* report, and the June 2025 *Water Outlook* report. The two strategy documents consist of the 2019 *Water Strategy* and the 2019 *Resilience Strategy*.

The *Water Outlook* Reports were created in 2018 and updated approximately bi-monthly during 2018, thereafter updates were done annually with the exception of 2019 and 2021. They provide updates on the city's water supply situation, demand, risks, and future planning, reflecting technical and public-facing reporting documents. The 2018 edition used in this analysis framed dam water levels in relation to demand reduction, restrictions, augmentation, and the threat of Day Zero. The 2020 edition in turn describes how climate uncertainty is being factored into water planning for the future, and how diversification of water sources are starting to be implemented under the new water programme. The 2025 edition provides a seasonal forecast, description of Cape Town's current and future water demand, the risks to their water supply, an update on the water augmentation programme,

advanced water treatment, as well as improved management of the water supply system and an update of the water strategy along with the risks of imposing water restrictions.

Cape Town's *Water Strategy* was created in 2019 following the severe drought of 2018 to hopefully avoid another close call with Day Zero. This strategy covers the need for a new relationship with water and the City's five commitments; Safe access to water and sanitation, wise use, sufficient, reliable water from diverse sources, shared benefits from regional water resources, and a water sensitive city (City of Cape Town, 2019a). As well as describes the future of Cape Town's water supply to the consumers, residents, investors, and business owners. Finally it also discusses how to translate the strategy into action.

Cape Town's *Resilience Strategy* was also created in 2019 in the light of the 2018 crisis. This strategy covers more than merely resilience toward water scarcity, instead it describes all prioritised shocks and stresses and how to build resilience using five pillars. The five pillars are; Compassionate, holistically-healthy city, Connected, climate-adaptive city, Capable, job-creating city, Collectively, shock-ready city, and Collaborative, forward-looking city (City of Cape Town, 2019b).

The 2018 *Water Outlook* report was selected as it was an early public-facing Water Outlook report written during the drought crisis, hence being able to provide insight into the discourse during the crisis. The 2020 *Water Outlook* report was similarly selected to provide an insight into the transitional discourse immediately after the drought – as no Water Outlook report was published in 2019. The 2025 *Water Outlook* report was selected to provide insight into the discourse years after the drought to see if there has been a significant shift in water policy discourse. Together the three editions of the *Water Outlook* report provide insight into crisis, transitional post-crisis, and longer-term post-crisis discourse.

The *Resilience Strategy* was chosen as it places water scarcity and the drought within a broader context of urban resilience framework, connecting it to climate change and governance. In the same vein, the *Water Strategy* was chosen as it presents a post-crisis strategic reframing of water scarcity into long-term water security and shared responsibility.

Overall, the documents were purposely selected because they represent different phases in Cape Town's institutional response to freshwater scarcity and water governance, from the acute Day Zero crisis to later strategies of long-term resilience and water security, allowing for comparison over time.

The dataset of five documents was chosen to be a manageable size for a thematic analysis but with different document types to provide a broader framing within these five documents, and since all documents are from the same institution, they are suitable for comparison.

### *4.3 Analytical approach: Reflexive Thematic Analysis*

As mentioned in the introduction to this section, this study utilises a reflexive thematic analysis approach to document analysis. Reflexive thematic analysis is not just counting repeated words, it focuses on meaning, interpretation, and patterns. The reflexive thematic analysis is used because the themes were not treated as simply emerging from the documents, but rather actively developed through repeated reading, colour coding, interpretation, and comparison across the dataset (Braun & Clarke, 2019; Ahmed et al., 2025). The recognition of the researcher's role in identifying the patterns of meaning and using them to construct relevant themes is what makes the approach reflexive thematic analysis rather than just thematic analysis (Braun & Clarke, 2019).

Reflexive TA is suitable for this study as it allows for comparison of documents across time, identification of recurring patterns in language and framing as well as analyse shifts in meaning, combined with framing theory it allows interpretation of how CCT constructs water scarcity as a problem in official documents over time (Entman, 1993; Braun & Clarke, 2019). The reflexive approach is especially beneficial as this analysis tracks changes in framing in regard to crisis, behavioural responsibility, climate uncertainty, and systemic resilience.

This study has utilised a hybrid approach to reflexive TA, employing an inductive approach in allowing patterns to develop from the documents themselves, but also employing a deductive approach through coding with the research question and framing interest in mind, specifically looking for issue framing, tone and language, responsibility, uncertainty, governance, time orientation, and complexity. However, it also utilised a template analysis, developing a coding template using the data set, by developing it while familiarising with the data, to then carry out the coding and allowing the researcher to develop themes from the codes with the richest data (King, 2004).

Furthermore, the study has also utilised both latent and semantic coding within the analysis. Semantic coding refers to coding that is explicitly stated (e.g. 'Day Zero', 'water security', and 'groundwater schemes'), latent coding being also coding the interpretation of underlying meanings (e.g. 'to get through the drought', 'water-wise use', and 'together we can').

### *4.4 Coding process*

The coding process involved repeated close reading of the five documents and the colour coding of passages that revealed how freshwater scarcity was framed, explained, and connected to responsibility, risk, governance, and long-term planning. These dimensions were

chosen when creating the coding template, as they were recurring throughout the selected documents and were central to how CCT framed water scarcity over time.

After familiarisation with the documents, a colour code was created, to be used in order to make coding efficient and easy to follow while writing the analysis. The colour code consisted of the codes visible in the table below.

| **Colour** | **Coding focus** |
|---|---|
| Red | **Issue framing:** how scarcity is described, as a technological issue, crisis/emergency, climate/environmental problem, economic constraint, or long-term structural condition. |
| Dark yellow | **Tone/framing language:** is the language urgent/alarmist, neutral/technical, or strategic/forward-looking. |
| Dark Green | **Responsibility:** who is framed as being responsible? Is it residents by saving water and changing behaviour, is it the City of Cape Town/municipality, is it the businesses/industries, or is it everyone? |
| Blue | **Solutions, interventions, governance:** What kinds of solutions are emphasised? Is it behavioural, by using less water, is it technical through infrastructure, economic through pricing and tariffs, is it governance through planning and policy, or is it systems/resilience through integration and adaptation? |
| Orange | **Time orientation/focus**: where is the focus in the documents? Is it the immediate short-term focus, is it medium-term planning, or is it long-term vision? |
| Light yellow | **Complexity vs simplicity**: how complex is the explanation of scarcity? Is it simple, such as due to low rainfall, is it multi-causal, such as seen through both climate, population, and infrastructure, or is it systems thinking with viewing it through interconnected risks? |
| Light green | **Uncertainty and risk:** how do the documents deal with the future? Is it through certain predictions, acknowledgement of uncertainty, scenario planning, or risk language? |

Table 1: Description of colour codes

The higher-order coding categories (issue framing, responsibility, time orientation/focus etc) were developed through a combination of repeated engagement with the CCT documents, framing theory approach, and with keeping the research question in mind during this part as well to ensure alignment. However, some of the coding categories also come from influence from previous literature, for example, governance and solutions from water governance literature such as OECD and Head. While time focus came from the research question and the focus on change over time. The lower-order categories, such as resilience, adaptive planning, technical issue, climate change, and diversification, were developed through the data while familiarising and the first read-through and further during coding as they were seen to describe or provide insight into the higher-order categories.

The coding consisted of in-depth reading and highlighting with the help of the colour code, the coding was both semantic with concrete words or phrases such as, ‘Day Zero’, ‘water security’, and ‘climate uncertainty’. As well as latent coding, with phrases that can give an interpretation of underlying meanings such as, ‘get through the drought’, ‘water-wise use’, and ‘robust and adaptable planning’.

### *4.5 Theme development*

After coding, connections between colour-coded passages were examined in order to create themes. These connections were then formulated into themes that were examined to ensure they appear across several of the documents, ensuring they are analytical rather than just descriptive, that there is enough evidence within the documents to support the supposed shift, and that it answers the research question. The themes were developed through the researcher’s repeated engagement with the documents and their contents, comparison of coded material across the documents, as well as through the researcher’s interpretation of the findings. The final themes and the colour codes used to create them are visible in Table 2 below.

| **Code** | **Theme** |
|---|---|
| Tone & Framing (dark yellow) + Time focus (orange) + Uncertainty & risk framing (light green) | From emergency to permanent risk |
| Responsibility (dark green) + Governance, solutions, interventions (blue) + Tone / framing (yellow) | From behavioural compliance to collective adaptive governance |
| Uncertainty & risk framing (light green) + Time focus (orange) + Complexity vs simplicity (light yellow) + Governance, solutions, interventions (blue) | The institutionalisation of climate uncertainty |
| Complex vs simple (light yellow) + Issue framing (red) + Governance, solutions, interventions (blue) + Responsible (dark green) | Water scarcity as a systemic urban resilience challenge |

Table 2: Relationships between colour codes and final themes

The codes were combined into themes guided by the research question, looking for themes which helped explain a shift in CCT’s framing, the codes were also combined when they pointed toward the same broader framing pattern, for example, tone and framing language, time focus, and uncertainty and risk framing all pointed toward a shift from emergency language to a more permanent risk. Subsequently, the themes also had to appear across several documents and be supported by sufficient textual evidence, not be based on

isolated instances. Furthermore, the themes had to be analytical, capturing changes in CCT framing over time rather than descriptive and isolated.

These themes were chosen as the final themes due to the fact that they cover the main shifts in CCT's framing of water scarcity. They capture the shift from crisis framing to long-term risk framing, the shift from focus on individual responsibility to collective or institutional governance responsibility, the shift from climate uncertainty as an external risk to climate uncertainty as a planning condition, and the shift from being a water supply issue to being a systemic urban resilience issue.

### *4.6 Framing-oriented analysis*

The research question for this study seeks to examine the framing of water scarcity within public institutions, the analysis will therefore not only examine what CCT says about water scarcity but also how the problem is constructed within the texts. Framing can help explain how official documents such as the *Water Outlooks*, *Water*- and *Resilience Strategy* make certain aspects of water scarcity more visible through the emphasising of urgency, management, or importance. Framing theory will therefore be used to guide the analysis and the interpretation of the documents. Reflexive TA identifies the patterns, meanwhile framing theory provides a framework for interpretation of the patterns meanings. For example, reflexive TA supports the researcher in finding patterns (e.g. repeated references to crisis, responsibility, resilience etc). But framing theory provides a lens on how to interpret those patterns and see how they construct water scarcity as a particular problem, for example, repetition of 'Day Zero' is not just repetition, it frames scarcity as an emergency and survival issue. Framing theory helps connect language to governance, showing that wording is not neutral and that deliberate wording and framing of water scarcity can shape public perception and what type of governance response is deemed appropriate.

The use of framing within the analysis of this study is intended to guide the examination of the documents by focusing on how water scarcity is defined as a problem, how its causes are explained, how responsibility is assigned, how solutions are presented, how urgency, risk, and uncertainty are constructed, and how the future of water governance is imagined.

Framing theory becomes an especially useful analytical lens within this reflexive TA document analysis as official documents are not neutral texts, they communicate institutional understandings of water scarcity, making certain interpretations more visible than others. An

example of this is that a document can choose whether to focus on ‘Day Zero’ or emphasise resilience, water security, affordability, or climate uncertainty.

### *4.7 Limitations, reflexivity, and positionality*

Despite the contributions of this research, certain limitations of the study design must be acknowledged. This section will present limitations of the data, of the method and of the temporal scope, while also addressing the researcher's reflexivity.

This study has utilised a relatively small dataset, using five official CCT documents, however, the size of this dataset is appropriate for a close qualitative analysis such as the one in this study. Further limitations of the data is that it only represents official institutional discourse and does not include the perspectives of residents, media coverage, NGO response, nor National Government documents. The data can therefore not be considered as a representation of all public debate regarding water scarcity in Cape Town, this is however not of greatest concern as the analysis is focused on CCT’s framing of scarcity, not on the residents’ interpretations or response to that framing.

Other important limitations to consider are in regards to document analysis of policy and strategy documents, which are formal texts that may present an idealised version of institutional action, in addition to this they may also emphasise progress and legitimacy while leaving out criticism, uncertainty, or failures. Further limitations within the methodology concern the interpretive nature of reflexive thematic analysis, however, the analysis does not claim to produce objective or universally fixed themes. Furthermore, another researcher might code the documents differently or develop different themes, and while colour coding helps make the analysis systematic, it does not remove the researcher's involvement in interpreting the data. The findings should therefore be understood as an argued interpretation of the documents not as a definitive account of all possible framings of water scarcity.

The temporal limitations include the fact that the documents cover selected points between 2018 and 2025, not a year-by-year account, despite not covering every year from 2018 to 2025 the documents are temporally spread across crisis, post-crisis, and long-term planning phases. As a result of this, the analysis traces broader shifts in framing over time rather than every year of the change in CCT’s discourse.

In regards to reflexivity, as discussed in the section on reflexive thematic analysis, the themes used within the analysis were actively developed through interpretation rather than treated as objective categories. This means that the researcher’s own analytical choices shaped how patterns were identified, grouped, and interpreted. To strengthen the

transparency, the study used a clear coding framework, compared documents systematically, and linked the final themes to textual evidence from the documents for example through using direct quotes when relevant.

The scope of the study's claims is therefore limited to patterns identified within the selected documents. The study does not claim to represent all institutional thinking within CCT, nor does it claim to measure the effectiveness of policy measures, or assess whether or not CCT's water governance actually succeeded.

I would like to acknowledge my positionality in relation to this thesis. I am a young northern European woman who is approaching this case from an external position, never having lived in Cape Town or myself experienced a severe water crisis or drought. Because of this the analysis remains grounded in the selected documents and is presented as one interpretation rather than a definitive account. Moreover, my educational background in development studies and sociology shape how I approach this subject, directing focus toward the social dimensions of water scarcity, rather than treating scarcity only as a hydrological issue.

## *5. Results*

The thesis explores how The City of Cape Town's (CCT) framing of freshwater scarcity has developed over time: from the threat of a Day Zero during the severe drought in 2018, to 2025, where climate change is framed as a constant and ongoing factor. The thesis performs thematic analysis, to identify and develop themes across five CCT documents published between 2018 and 2025. Three of these documents are Water Outlook reports produced by the Department of Water and Sanitation. The Water outlooks are published periodically, and the three outlooks used in this analysis are from February 2018, October 2020, and June 2025. The other two documents are strategies developed by CCT in 2019: the first one is CCT's Water Strategy and the second one is CCT's Resilience Strategy. The result is organised around four themes that capture overall framings of water scarcity across the policy documents. These emerged from the thematic analysis and includes emergency and risk, responsibility and governance, climate uncertainty, and systemic urban resilience. Table 3 below provides an overview of the comparison of the documents in relation to the overall framings of water scarcity.

| **Frame** | **Water Outlook 2018** | **Water Strategy 2019** | **Resilience Strategy 2019** | **Water Outlook 2020** | **Water Outlook 2025** |
|---|---|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| **Emergency, Risk and Preparedness** | Water scarcity is framed as an immediate crisis due to severe drought; focus on "getting through" the drought and avoiding Day Zero. | Water scarcity and the drought crisis become lessons for future planning; Day Zero framed as something to remember but avoid repeating. | The drought is framed as a shock among other shocks and stresses. | The crisis has passed but drought risk prevails and still guides planning. | Risk of drought or severe water scarcity has led to thinking and planning of water security, restrictions risk, and long-term monitoring. |
| **Responsibility and Governance** | Behavioural alleviation strategies prevalent, with residents framed as needing to reduce water consumption and comply with restrictions. | Responsibility has shifted some, still dependent on residents to keep up with water saving activities, but the City and institutions are also emphasised. | Responsibility of keeping consumption levels down expands to whole-city resilience; covering city government, households, businesses, and civil society. | Continuation of shared responsibility, however more emphasis is put on City planning and implementation. | Institutional responsibility, with infrastructure affordability, regulation, public engagement, and stakeholder management. |
| **Climate Uncertainty and Planning** | Uncertainty around immediate rainfall and dam-levels. | Climate uncertainty becomes more prevalent and becomes the basis for long-term planning. | Climate change becomes integrated into the framework regarding broader shocks/stresses. | Uncertainty becomes part of scenario planning and resource diversification. | Uncertainty is now embedded in forecasting, conservative planning, assurance levels, and future risk management. |
| **Systemic Resilience Framing** | Water scarcity, mostly framed as a water systems problem, mentions dams, demand, restrictions, and augmentation. | Water in relation to people, the environment, economy, poverty, sanitation, and growth | Water scarcity linked to climate change, inequality, food insecurity, infrastructure, finance, and social vulnerability | Water scarcity in relation to drought recovery, demand patterns, climate, augmentation, and COVID. | Water scarcity is linked to affordability, infrastructure stability, regional resilience, and governance capacity. |

Table 3: Thematic comparison of water scarcity framing across City of Cape Town documents, 2018-2025

### *5.1 From Emergency to Permanent Governance Risk*

The theme captures how water scarcity moves from being framed as an emergency to be endured, to a permanent governance risk that must be anticipated, institutionally managed, and planned for. The emphasis put on diversification, resilience, and future droughts clearly suggests that scarcity has become normalised within CCT frameworks and planning

discourse, not merely as a temporary disruption but as an ongoing condition, which shapes water governance holistically. Scarcity shifts from being perceived or framed as an immediate emergency to something that has increased in likelihood of recurring as a future risk and later to scarcity being framed as something that needs to be built into water governance, water scarcity governance.

In the 2018 *Water Outlook*, water scarcity is framed as an immediate emergency using phrases such as "To get through the drought" (City of Cape Town, 2018, p. 1), and "drought emergency" (City of Cape Town, 2018, p. 5) which are forms of alarmist and survival language signalling an experience that cannot be avoided at this point but needs to be endured. The Outlook also uses statements such as "Every person in the city to realise that this is a crisis." (City of Cape Town, 2018, p. 2), which emphasises a crisis-mobilisation language and frames water scarcity as requiring behavioural compliance and adaptation in the form of consumption reduction and demand reduction. In addition to this further urgency is emphasised when highlighting that daily behaviour is directly connected to system failure risk, this is done by reiterating that the dam levels lower every time the water consumption limit is exceeded. Furthermore it is noted in Outlook 2018 that augmentation is not enough, and that effectively managing the water demand levels is the only alternative to avoid the projected Day Zero event, "Augmentation will not make a significant difference to dam levels this summer and there is therefore no alternative but to ensure effective demand management" (City of Cape Town, 2018, p. 2). The 2018 *Water Outlook* constructs scarcity as something urgent that needs immediate demand reduction and positions residents behaviour as something directly linked to system failure.

There is a clear beginning of a shift in the discourse from emergency and immediate danger to post-crisis learning already in the 2019 strategies and 2020 *Water Outlook*. Day Zero is used as something that served as a lesson, something they managed to avoid, and defeat as described in the Water Strategy (City of Cape Town, 2019a). The language and focus takes a clear turn from emergent and immediate to a more futuristic view of how to move forward and work to avoid another situation like "The extreme drought shock " (City of Cape Town, 2019b, p. 12). The 2020 *Water Outlook* uses the close call of Day Zero in 2018 as a motivation for people to keep up with their water saving efforts, formulating it as "rather save water while you have water" as it only took 3 years to end up in the inevitable position the drought of 2018 put the city in (City of Cape Town, 2020, p. 13). The Outlook also reiterates the role that effective management of the drought has had in avoiding a "potential catastrophe", as "Effective management of the crisis has now ultimately earned us the title of 'Number One Water Saving City in the World'" (City of Cape Town, 2020, p. 2).

Furthermore, ways of diversifying the city's water resources are starting to be discussed while still remaining focused on water conservation and demand management, “our water planning which seeks to increase drought resilience through diversification of resources including groundwater, reuse and desalination whilst continuing to maintain focus on our acclaimed water conservation and demand management initiatives” (City of Cape Town, 2020, p. 2). It is evident from these examples that the discourse has started to shift, from an alarmist survival language towards risk-management language, showing the citizens that there is no longer any need to panic but that water should still be saved and used cautiously as the future supply remains uncertain. The 2020 *Water Outlook* and 2019 Strategies has reframed the use of Day Zero, it is now no longer mainly a threat but rather a lesson or warning symbol that provides justification for future preparedness.

The 2025 *Water Outlook* shifted focus even more from immediate action toward enhancing the management of freshwater and water resources holistically, “from spatial planning to resource conservation”, as well as planning for the future with the Adaptable Programme, which seeks to further diversify CCT’s water resources and “enhance its resilience to future droughts” (City of Cape Town, 2025, p. 14, 26). The 2025 *Water Outlook* emphasises the final shift and shows how water scarcity now is framed as normalised and to be planned for. The framing has shifted from how to survive an immediate crisis to how to govern recurring scarcity.

| **Document** | **Framing of scarcity** | **Analytical meaning** | **Illustrative examples** |
|---|---|---|---|
| 2018 *Water Outlook* | Framed as an immediate crisis, Day Zero threat, survival, immediate demand reduction | Scarcity framed as a crisis to be endured | “Get through the drought” |
| 2019 Strategies | Lessons from drought, keeping up with water-wise behaviour, future preparedness | Crisis becomes framed as a learning point | “The recent drought experienced by Cape Town brought to the fore the need for extensive partnering around water governance” (City of Cape Town, 2019b, p. 36)<br><br>“The City will undertake a responsible new build programme, comprised of a diverse range of water sources, to increase water security and increase resilience.” (City of Cape Town, 2019a, p. 32) |

| | | | |
|---|---|---|---|
| 2020 *Water Outlook* | Caution in relation to future water supply, saving water still important | Scarcity framed as ongoing risk | "the City continues to work hard at conserving water resources and increasing available water supply so we can more easily withstand future droughts" (p. 3) "we need to continue using water wisely" (p. 16) |
| 2025 *Water Outlook* | Long-term water security, diversification, resilience | Scarcity normalised as a permanent governance concern | "planning has begun for the next phase of infrastructure – the Adaptable Programme – which will further diversify the City's water resources and enhance its resilience to future droughts." (p. 29) |

Table 4: Temporal Comparison Table: From Emergency to Permanent Governance Risk

### *5.2 From Behavioural Compliance to Collective Adaptive Governance*

This theme shows a clear shift from crisis-era behavioural compliance. CCT's framing changes through the redistribution of responsibility. It moves from 2018 where residents were framed as responsible for bringing down consumption. To a more collective adaptive governance framework where the responsibility is distributed across residents, institutions, experts, infrastructure systems, and multiple spheres of government. This shift is expressed through continued advocacy for wise water use, the implementation of diversifying projects and collaborative efforts to improve long-term water efficiency and resilience.

Since the drought in 2018 was an emergency in need of immediate action, most of the responsibility of this action landed on the residents of Cape Town, in the shape of reduction of their water use in compliance with the restrictions that the CCT implemented. This is evident in the 2018 *Water Outlook* as it states that the consumption limit of 50 litres of water per person per day is enforced whether the person is at home, at work or elsewhere. Water use at higher volumes will be followed by additional charges to keep compliance with the restrictions (City of Cape Town, 2018, p. 2). Besides these restrictions and tariffs the city has also installed water management devices, especially to households that have not reduced their consumption, in order to restrict household consumption as well as safeguard against potential leaks (City of Cape Town, 2018, p. 2). In addition to this the city is also implementing communication campaigns, water pressure reduction, and providing information to drive behaviour change, "The city has launched numerous communication campaigns to assist people in reducing their consumption /…/ and continues to use radio, print and social media to reach every citizen" (City of Cape Town, 2018, p.2). This framing,

of compliance, restrictions, and demand reduction, individualises the responsibility of the water scarcity crisis and Day Zero, by making the households the key actors to avoiding Day Zero.

Moving into 2019 the responsibility still lies heavily on the residents but have moved to include a more collective approach with language such as “Together we can” reiterated multiple times (City of Cape Town, 2019a, p. -2). Furthermore, it is stated that in order to achieve the “vision of a water-sensitive Cape Town through wise water use will depend on the actions of all the city’s people and institutions” (City of Cape Town, 2019a, p. 4). Taking the responsibility away from purely residents and on to the institutions as well with realisations that demand can be influenced by the city it is the behavioural choices of residents, businesses, and institutions that determine its effectiveness. But also outlining what the city will do to help with building water resilience, and increase water supply (City of Cape Town, 2019a; City of Cape Town, 2019b). The use of collective phrases in the 2019 strategies highlights the shift from individual compliance to shared responsibility of stakeholders.

Continuing to 2020, the *Water Outlook* uses the slogan “Making progress possible. Together.” (City of Cape Town, 2020, pp. 1-15) throughout the report, appearing in the footer of each page, further reiterating the shift towards a more collective approach to change and adaptation. The City’s role becomes more prominent, while residents are primarily mentioned in recognition of their past contribution to avoiding Day Zero, and how “Growth in water consumption coming out of the recent drought has remained relatively benign, due to continued saving efforts by residents and businesses”, especially through “permanent behaviour change” and the "unprecedented adaptation” of residents and businesses during the drought (City of Cape Town, 2020, pp. 3, 12). The City is described as continuing with work regarding conserving water resources, increasing water supply, reducing reliance on rainwater fed dams and commitments the City has made to work more with stakeholders and develop a Decision Support System to assist the City in its work with managing water resources (City of Cape Town, 2020, pp. 2, 12).

By 2025, the *Water Outlook* continues to lessen the role of residents, still advocating for wise water use, “However, we continue to advocate for 'water-wise use' and encourage residents to use water as efficiently as possible”, and recognising their past and current contributions to keeping the water demand per capita down, “The residents of Cape Town should be commended as it appears that growth in per capita water demand has settled”, and once again the slogan is visible on all pages (City of Cape Town, 2025, pp. 4, 5). However, the City’s work, contributions and projects are the primary content of the report. With

mentions of the City working proactively to ensure a reliable water supply system, increasing investments in new water programmes to increase water security, and agreements with the National Department of Water and Sanitation (DWS) to purchase water from a river in addition to continuing to diversify CCT's water supply sources (City of Cape Town, 2025, p. 13). Furthermore, the City has over the last year worked with "the development and commissioning of all three groundwater schemes" (City of Cape Town, 2025, p. 14) the schemes are the Table Mountain Group Aquifer, the Cape Flats Aquifer, and the Atlantis Aquifer. These schemes are executed with quality monitoring and sustainable use in mind by the DWS, with the City as a supporting actor to ensure the fulfilment of the mandates. Besides this, the CCT also provides annual reviews of "the long-term water balance between available supply and projected water demand" (City of Cape Town, 2025, p. 28). This implies that that CCT notes the importance of not overdrawing from these groundwater schemes, but ensuring that the groundwater is used sustainably, while still developing how they should be used, providing annual reviews of the relationship between supply and demand provides an additional way of ensuring the aquifers' do not become exhausted. So, in 2025, residents are still included and water-wise use is continuously encouraged, but the main responsibility moves to CCT planning, DWS cooperation, groundwater management, and infrastructure. This shows that while the main focus shifts, responsibility does not disappear from residents but rather becomes embedded in wider governance frameworks.

| **Document** | **Main actor framed as responsible** | **Type of responsibility** | **Illustrative examples** |
|---|---|---|---|
| 2018 *Water Outlook* | Residents | Reduce consumption, comply with restrictions | "To manage daily demand requires that each person should use no more than the defined volume per day, whether they are home, at work or elsewhere. Reaching the overall demand target is only possible if individual use is curtailed " (p. 2) |
| 2019 Strategies | Residents, businesses, institutions the City | Shared responsibility and collective action | "Cape Town's Resilience Strategy is a commitment to ensure that we thrive in the future regardless of the challenge. It is a commitment to work together, with a common vision, across government departments, spheres of government and with individuals and organisations across the city as a whole." (City of Cape Town, 2019b, p. 8) |

| | | | |
|---|---|---|---|
| | | | "We are all custodians of water and the City is the driver of change." (City of Cape Town, 2019a, p. -2) |
| 2020 *Water Outlook* | Residents and the City | Residents are recognised, City planning becomes more visible | "it was the unprecedented adaptation by our residents and businesses that avoided the taps running dry" (p. 12)<br>"We are committed to significantly reduce reliance on rain fed dams over the planning period and aim at achieving a level of water resilience by 2028." (p. 4) |
| 2025 *Water Outlook* | City, DWS, residents | Institutional planning, investments, water-wise use | "The City is actively working to ensure a robust and reliable water supply system through a proactive approach that identifies and addresses vulnerabilities" (p. 9)<br><br>"However, we continue to advocate for 'water-wise use' and encourage residents to use water as efficiently as possible." (p. 4) |

Table 5: Temporal Comparison Table: From Behavioural Compliance to Collective Adaptive Governance

### *5.3 The institutionalisation of Climate Uncertainty*

Across these documents, climate uncertainty shifts from being in the immediate drought context, to a permanent feature of CCT's water governance and long-term planning. In the 2018 *Water Outlook*, uncertainty is still closely tied to the immediate drought crisis, particularly through references to rainfall, runoff, and dam levels. Mentions of climate change and its consequences as well as unpredictability has shown that CCT's reliance on rain-fed dams is unreliable due to being so dependent on a single water source (City of Cape Town, 2018). However, dam levels are tracked and forecast (City of Cape Town, 2018, p. 5). Uncertainty is still treated as part of the crisis monitoring of dam levels, rainfall, and demand.

There is a significant shift in framing from 2018's *Water Outlook* to the strategies of 2019, with the focus clearly shifted from immediate drought crisis to how to manage this in the future, how to account for climate uncertainty, such as rainfall uncertainty in planning processes. The *Resilience Strategy* points out how drought of 2018 is used as a starting point for the City to "consider what it means to manage a system under stress with an uncertain picture of the future (in this case, the amount of rainfall)" (City of Cape Town, 2019b, p. 118). This line of thinking is followed by further realisations about the possible threat of climate change and the challenges it might pose to the City. CCT has a geographical

disadvantage in the light of climate change, making them increasingly vulnerable to weather events, especially decreased rainfall (City of Cape Town, 2019b, p. 7). This is followed by an increase in likelihood of more intense droughts as rainfall becomes even less predictable. The drought highlighted how severe the impacts of climate change can be, and its impact on a variety of systems within the city, which in turn has highlighted the importance of integrating climate change into planning aspects. The *Resilience Strategy* also points out that scenario planning should be utilised as to "consider a variety of plausible, possible futures" (City of Cape Town, 2019b, p. 132), and how building of resilience calls for adaptive responses to climate change both cross-sectoral and multi-scale (City of Cape Town, 2019b).

The *Water Strategy* reiterates these realisations, concerns, and uncertainties, discussing how climate change will impact CCT and the variability in rainfall patterns and how this can affect the water availability, "Changes in temperature and wind also affect water availability. The development and management of surface water schemes in South Africa take these uncertainties into account" (City of Cape Town, 2019a, p. 3). Rather than presenting climate uncertainty as something that can be resolved, the strategy frames it as a condition that must be incorporated into planning through scenario-based, robust, and adaptable approaches (City of Cape Town, 2019a). To account for rainfall variability, the diversification of water sources becomes key, as reliance on a single water source is no longer framed as viable. This leads the City to prioritise water sources "that can be scaled and have adaptable implementation timing" (City of Cape Town, 2019a, p. 32). The strategies show how uncertainty moves to become a planning condition rather than an emergency variable.

The 2020 *Water Outlook* follows the same theme but with elements of climate forecasting beginning to emerge more clearly, through projections such as: "Findings based on three different climate change scenarios suggest a moderate chance of a 23% reduction in water availability from the six large dams by 2050" (City of Cape Town, 2020, p. 2). The 2020 *Water Outlook* also extends forecasting to future demand, behavioural rebound and economic growth. Showcasing how uncertainty becomes institutionalised through planning assumptions. Utilising scenarios and planning has turned uncertainty into something that can be estimated, incorporated, and governed.

The 2025 *Water Outlook* implements a more cautious and adaptive approach to forecasting after previous seasonal climate predictions proved unreliable, including cases where a dry winter was forecast but extreme flood events occurred instead. The report also adjusts its climate planning assumptions by adopting the 50th percentile of climate change forecasts (City of Cape Town, 2025, pp. 29, 30). This is justified on the basis that the original *Water Strategy* assumptions were highly conservative, while evidence had not yet shown a

major change in climate conditions (City of Cape Town, 2025, pp. 3, 29). This shows how uncertainty is institutionalised through adjustable planning assumptions rather than fixed predictions. By revising these assumptions CCT now frames uncertainty as something that cannot be solved once and then is fixed but rather as something that needs continuous adjustment.

| **Document** | **Form of uncertainty** | **Planning response** | **Illustrative examples** |
|---|---|---|---|
| 2018 *Water Outlook* | Rainfall and dam levels uncertainty | Emergency restrictions and demand reduction | "In the past, the Western Cape Water Supply System has relied almost exclusively on surface water sources stored in dams /…/ However, in the context of a highly variable and unpredictable climate, it is not prudent to be so heavily dependent on a single source of water." (p. 3)<br><br>"Daily individual consumption must be limited to a maximum of 50 litres per person per day (pppd) to be aligned with Level 6 tariffs." (p. 2) |
| 2019 Strategies | Rainfall variability in relation to climate uncertainty | Scenario-planning and adaptive responses | "As climate change intensifies, we are becoming increasingly vulnerable to weather-related shock events, in particular increased heat and decreased rainfall" (2019b, p. 7)<br><br>"Integrate climate change into planning" (2019b, p. 14)<br><br>"Utilise robust scenario planning for improved resilience" (2019b, p. 132)<br><br>"The additional uncertainties associated with climate change now need to be included in future planning, including changes in rainfall /…/ Nobody is able to accurately predict the future climate and water availability, so Cape Town needs to make plans that are robust in the context of this uncertainty" (2019a, p. 3) |
| 2020 *Water Outlook* | Climate change scenarios and future demand | Forecasting | "Findings based on three different climate change scenarios suggest a moderate chance of a 23% reduction in water availability from the six large dams by 2050. This is being factored into our water planning which seeks to increase drought resilience through diversification of resources" (p. 2) |

| | | | |
|---|---|---|---|
| 2025 *Water Outlook* | Forecasting limits and revised assumptions | Adaptive and adjustable planning | "Climate forecasting, particularly seasonal predictions, are inherently uncertain and require cautious interpretation as was evident over the last few years, where seasonal forecasts proved unreliable" (p. 3)<br><br>"planning has begun for the next phase of infrastructure – the Adaptable Programme – which will further diversify the City's water resources and enhance its resilience to future droughts." (p. 29) |

Table 6: Temporal Comparison Table: The institutionalism of Climate Uncertainty

### *5.4 Water Scarcity as a Systemic Urban Resilience Challenge*

Overall, this theme shows the shift from an immediate-response framing focused on dam levels, rainfall, restrictions, and short-term augmentation to ensuring safe drinking water for all citizens, ensuring quality before implementation, maintaining infrastructure, building public trust as well as strengthening long-term governance capacity. CCT's framing is expanded by connecting water scarcity to more urban systems over time.

The 2018 *Water Outlook* mostly frames water scarcity through concern about dam levels, demand reduction, the avoidance of Day Zero, and short-term augmentation measures. While it acknowledges that water demand in Cape Town will continue to increase as a result of both population and economic growth, this is still discussed mainly in relation to pressure on the water supply system (City of Cape Town, 2018, p. 4). In this sense, the 2018 framing remains narrow with scarcity primarily presented as an issue of prevention and maintaining supply during a crisis.

In 2019, the *Resilience Strategy* acknowledges the necessity of strengthening support to local communities and informal settlements, especially in regard to improving water and sanitation management. In addition to this there is emphasis on building urban resilience with benefits including social cohesion (City of Cape Town, 2019b, p. 6). The *Water Strategy* further develops the systemic framing through its emphasis on diverse infrastructure, optimising stormwater use and urban waterways, as well as increasing the efforts to improve living conditions in informal settlements and prioritising "quality of life for everyone in the city" (City of Cape Town, 2019a, p. 3). Simultaneously, safe access to water and sanitation for all residents is one of the five commitments of the strategy, as the City recognises it as a fundamental human right, the strategy puts it as "Having access to a basic amount of water every day is a human right, and so the City provides this basic water allocation for free to

those who cannot afford to pay for it" (City of Cape Town, 2019a, p. 21). Alongside this, free water within daily allowance volumes are provided for those living in informal settlements to ensure equal access (City of Cape Town, 2019a, p. 21). Furthermore, the third commitment of the strategy is to provide sufficient and reliable water from diverse sources in a cost effective and timely manner in order to increase resilience and reduce likelihood of severe restrictions in the future (City of Cape Town, 2019a). Scarcity has become increasingly connected to informal settlements, sanitation, urban resilience, and quality of life.

The 2020 *Water Outlook* continues along these lines, highlighting the need for maintenance of infrastructure to ensure that the efficiency of said infrastructure remains at sufficient levels. It also links water security to public trust especially in regards to new water infrastructure such as water re-use (City of Cape Town, 2020, pp. 9-10). This suggests that water scarcity is no longer only framed as an immediate issue but also as a challenge of institutional credibility and long-term system reliability. Scarcity is no longer being framed as only an issue of water availability, but also as an issue of public trust, whether residents trust the new infrastructure and reuse systems will determine their effectiveness.

The 2025 *Water Outlook* provides insight on the development of the infrastructure, such as the refurbishment of pipelines, water treatment plants, reservoirs, and filters, which all help reinstate plant capacity, in the case of refurbishing the Wemmershoek filters, 30% of the plant's capacity was reinstated (City of Cape Town, 2025, p. 12). It also discusses the plans to engage with issues such as water quality, river health, and the operation and maintenance of infrastructure, as well as seeks to "highlight the delicate balance that needs to be struck between the planning assumptions, ambitious commitments that were made in the Water Strategy, drought resilience, and affordability constraints" (City of Cape Town, 2025, p. 31). This shows that by 2025 water scarcity is framed as a complex governance challenge, not only regarding water availability, but also infrastructure quality, public health, and institutional planning.

| **Document** | **Framing of scarcity** | **Urban systems connected to scarcity** | **Analytical meaning** | **Illustrative examples** |
|---|---|---|---|---|

| | | | | |
|---|---|---|---|---|
| 2018 *Water Outlook* | Immediate water crisis | Dams, demand reduction, short term augmentation | Scarcity mainly framed as water-system emergency | "Every person in the city to realise that this is a crisis." (p. 2)<br><br>"Augmentation will not make a significant difference to dam levels this summer and there is therefore no alternative but to ensure effective demand management during this summer" (p. 2) |
| 2019 Strategies | Broader water security issue | Sanitation, informal settlements, affordability | Scarcity starts being framed as part of urban resilience and development | "The impacts of climate change /…/, have the ability to be amplified by poverty, food insecurity and a lack of social cohesion. These impacts, /…/ will be most severe in poorer communities, particularly informal settlements." (2019b, p. 54)<br><br>"The City of Cape Town will work hard to provide and facilitate safe access to water and sanitation for all of its residents" (2019a, p. 5) |
| 2020 *Water Outlook* | Transitional risk management issue | Water re-use, infrastructure, public trust | Scarcity linked to system reliability | "The Zandvliet Temporary Reuse Plant utilises proven multi-barrier technology to purify treated wastewater sourced from the Zandvliet Wastewater Treatment Works to a quality that exceeds current drinking water standards. International experience has shown that demonstration plants can be an effective way of building community trust" (pp, 9-10) |
| 2025 *Water Outlook* | Long-term governance and resilience issue | Infrastructure, water quality, river health, affordability, public health | Scarcity framed as systemic urban resilience challenge | "The WCWSS Water User Platform has strengthened over the last year and plans to engage and provide a way forward on several key issues over the next year. These include: Water quality, River health, Flooding and dam water releases, operation and maintenance of infrastructure serving users." (p. 23)<br><br>"the City aims to improve catchment intelligence in both natural (WCWSS catchments) and urban catchments (e.g. Atlantis, Cape Flats, Zandvliet), which provide, or will soon provide potable water to the City" (p. 25) |

Table 7: Temporal Comparison Table: Water Scarcity as an Urban Resilience Challenge

### *5.5 Synthesis: The Changing Institutional Framing of Freshwater Scarcity*

The results show that the overall framing of water scarcity has moved from a narrow approach, focused on immediate response, disaster mitigation and demand management in the 2018 *Water Outlook*, to become more integrated into the city's systems (including infrastructure, urban planning, environmental management, and social access) in the 2019 strategies and the 2020 *Water Outlook*, by realising the complexity of the issue and its impact on other parts of society and the city's residents. Normalising scarcity to increase resilience thinking in planning, emphasising the need to diversify the CCT's water resources and realising the importance of a multi-level response. While residents' efforts during the drought are still valued across the reports, the later documents increasingly emphasise the need for the City and other spheres of government to assume greater responsibility for strengthening Cape Town's resilience. The 2025 *Water Outlook* further consolidates this shift by framing water scarcity as a long-term governance challenge, emphasising the City's role in the planning and implementation of diversifying projects, as well as keeping up with their maintenance. Considering the economic impact on its residents, and strengthening stakeholder collaboration and building public trust.

This shows a shift in the discourse used to describe water scarcity over time; the shift occurred in response to a severe drought and climate change, which guided Cape Town's policies, strategies, and outlooks from a narrow crisis-response toward a broader, systemic, future-oriented model of water governance. So, CCT framing has changed in relation to the framings of emergency, shared responsibility, institutionalised uncertainty, and systemic urban resilience. While a shift has occurred it does not mean that older framings disappear, rather they become layered into later documents, crisis framing remains in the background, resident responsibility remains present, uncertainty becomes planned for, and systemic resilience becomes the dominant framing in later documents.

## *6. Discussion*

This section will discuss the findings of the analysis compared to previous literature and examine what could be done further within this research area.

### *6.1 From Crisis Response to Long-Term Water Governance*

The analysis shows a shift from crisis and emergency language used in 2018 toward the later documents' recognition of the need for long-term water governance through increasing resilience and the value of diverse water sources. This shift reflects what Head

(2010) discusses regarding water policy starting off as having a technological and economic approach and then adapting to be intertwined with the more complex issues of ecological and resource sustainability, that has come with pressure to form new strategic directions with focus on burden sharing and trade-offs. While technological and engineering solutions remain important, the findings suggest that they are no longer framed as sufficient on their own for addressing the challenges posed by climate uncertainty and long-term water scarcity.

Water scarcity starts out as mainly discussed as an environmental and hydrological issue, despite this it is seldom only an issue of environmental and hydrological proportions, but is inherently dynamic and intersectional. Meaning that instead of being made out to be a fixed issue of environment it changes with rainfall, population, and economic growth, water demand and climate uncertainty, it also means that people get affected differently depending on social factors such as income, housing, access to infrastructure, and ability to store water. Verre et al. (2026) emphasises the notion that water scarcity is intersectional and mentions variables such as political, economic, technological, and social variables that can influence water scarcity management and governance. Along with the mention of a tendency in traditional water scarcity indices of overlooking the impact of climate change on socio-economic patterns, as well as governance, and policies (Verre et al., 2026).

The shift in CCT's framing was not just a shift in language but also a shift in what kind of response that appears necessary and appropriate. In 2018 water scarcity was something to survive but in later years it became something that can be managed, planned for, monitored, and governed. It was no longer an immediate crisis or threat but rather a resilience challenge or planning condition with clear differences in suggested solutions, in 2018 the solutions were restrictions, reduced consumption, and emergency response, meanwhile later years the solutions became more complex, diversification of water sources, infrastructure planning, adaptive programmes, monitoring, and resilience. Despite this, the crisis language does not disappear, Day Zero remains a warning symbol, but instead of being a threat it becomes a justification for long-term planning.

This reflects the UN *Global Water Bankruptcy* report's argument that 'water stress' and 'water crisis' language may be insufficient in contexts where returning to the previous levels of water availability is no longer straightforward (Madani, 2026a). This does not mean that Cape Town is experiencing water bankruptcy. But it helps explain why immediate emergency framing becomes less suitable for describing the longer-term adaptation and governance shifts visible in CCT's later documents.

### *6.2 Shared Responsibility and the Politics of Water Governance*

The analysis covers how responsibility is framed in regard to water scarcity management during the crisis framing era of 2018 and the shift that happens in the years following. Said shift moved from individual responsibility of the residents of Cape Town to reduce their water consumption to combat the scarcity. To a more collective responsibility language during the transitional period with usage of the phrase ‘together we can’, followed by the City’s own role becoming more prominent in the later years.

The discourse moved from seeing water scarcity as a temporary disruption, where the main idea of mitigation or action is for the residents to lower their consumption levels. Toward an institutionalising of water governance and creation of water governance frameworks, among these, water tariff frameworks that can help avoid the need to implement harsh tariffs out of the blue but instead see the need for smaller tariffs when the situation is starting to shift, but not so late that it is a dire situation. Pro-active mitigation to ensure a situation like the one in 2018 doesn't occur again or at least to see it coming, having a plan on how to handle it already established so as to not have to lay most of the burden on their residents. Furthermore, this realisation on the importance of pro-active mitigation efforts, is also visible in the discourse regarding the reliance upon a single water source, and how that dependency is no longer viable. Developing more, new and diverse water sources to remove dependency on rainfall in times of increasing climate uncertainty, one example of an efficient but costly alternate water source is desalination. Desalination is discussed and cautiously implemented in Cape Town but prioritisation of the dams and groundwater use is still reality.

The UN *Global Water Bankruptcy* report emphasises the dangers of overusing water resources, particularly strategic reserves such as groundwater, which may replenish slowly or, in some cases, not within a realistic human timeframe. The report uses a bank account analogy to explain this: renewable water sources collect into a ‘checking account’, this is the water that re-plenishes fast, such as rivers, reservoirs, and snow. And then there is the ‘savings account’, this covers the very slowly renewable, or non-renewable resources, such as groundwater or glaciers. This analogy is useful for understanding the risks of treating groundwater as more than an emergency reserve during drought. If these reserves get overdrawn, that will say, if withdrawals exceed recharge for too long, the system can begin to lose the natural capital that supports future water availability (Madani, 2026a).

This is where the politics of water governance becomes especially important. While diversification reduces dependence on rain-fed dams, it does not remove the need for careful institutional management. This highlights that alternate water sources cannot simply be treated as unlimited long-term supply sources, and that if groundwater is used too heavily

without sufficient recharge and monitoring they will reach critical levels. This could cause the need for tariffs and restrictions, shifting the responsibility back on the residents. Therefore, diversification of water sources are not just technical solutions but also an issue of governance involving cost, access, risk, sustainability, and responsibility with an important question about the future, who carries the burden of future scarcity.

### *6.3 Climate Uncertainty and Adaptive Planning*

In a time with increasing climate change, weather forecasting, especially in regards to rainfall patterns, has become more unreliable. The analysis shows how CCT documents discuss rainfall uncertainty and institutional responses to it, moving once again from crisis response toward resilience and future planning so as to not be caught off guard by a drought or water-related crisis again. Utilising scenario planning and ensuring the plans are adaptive. While projections of demand and climate assumptions are used to incorporate uncertainty into long-term planning and guide decisions around water security, diversification, and risk management.

This matches earlier research which argues that water governance can no longer rely on historical rainfall patterns or fixed planning, but instead must become adaptive, context-specific, and responsive to uncertainty (Head, 2010; OECD, 2021; Krueger et al., 2025). Uncertainty cannot be combatted, or solved through a single plan, it must be managed through flexible and revisable planning, there is no one-size-fits-all solution for water scarcity management, hence the need for institutions to adapt to changing circumstances (OECD, 2015).

CCT shifted to not only focusing on finding new water sources, but also focusing on demand management, conservation of resources, efficiency, tariffs, and water-wise behaviour. This shows how uncertainty around future rainfall patterns becomes part of water governance, as it is managed through a combination of supply-side strategies, i.e. new water sources, reuse, augmentation, and demand-side strategies, i.e. conservation, water-wise behaviour, and tariffs, rather than one fixed solution (Head, 2010; OECD, 2021).

### *6.4 Water Scarcity as a Systemic Urban Resilience Challenge*

The final theme shows how CCT's framing of water scarcity expands from a water supply problem into a broader systemic urban resilience challenge. Scarcity becomes connected to infrastructure, inequality, affordability, public trust, climate resilience, and

governance capacity. Showing that water is not only shaped by environmental conditions but also shaped by institutions, urban systems, social vulnerability, and political choices (Head, 2010; OECD, 2021; Krueger et al., 2025). Water scarcity is not only about rainfall or dam levels, it also depends on whether the infrastructure can store, treat, distribute, and protect water in an effective manner (Head, 2010; OECD, 2021). While large-scale infrastructure such as dams, diversions, pipelines, treatment plants, and reservoirs can reduce scarcity, they can also create dependency on systems that can become vulnerable during drought (Madani, 2026a; OECD, 2021). Furthermore, larger infrastructure projects could enable urban growth beyond sustainable levels, creating dependence on potentially unreliable water sources, increasing the unequal effects of water scarcity on urban populations (Madani, 2026a). The later CCT documents discuss reservoirs, filters, treatment plants, pipelines, maintenance, and infrastructure stability. However, already in the 2018 *Water Outlook* is technological monitoring discussed, for example through household leak detection (City of Cape Town, 2018). This aligns with OECD (2021) recommendations that innovations such as smart meters and AI-driven systems that can help reduce losses and support efficiency. While infrastructure is necessary it needs to be governed. Maintained, trusted, financed, and made accessible for it to work to its fullest capacity (Head, 2010; OECD, 2021; Krueger et al., 2025).

Public trust is another part of water resilience, as technological solutions such as water reuse, desalination, groundwater, or new treatment systems require the public's trust to be effective. This is why risk communication matters, as besides the physical management of water, institutions also shape how the public perceive and understand risk and solutions (Head, 2010; OECD, 2021; Krueger et al., 2025). The CCT documents do discuss this but especially in regard to water reuse, and not particularly in regard to any of the other infrastructures. This could be due to perceived public concern about the water reuse specifically as this is a system that had not been used in Cape Town before, and concerns treated wastewater.

As stated in the paragraph above, water scarcity affects urban societies unequally, the same can be said for low-income communities, and informal settlements, they will not have the same experience of water insecurity as wealthier households. Hence scarcity remains a complex issue involving unequal access, storage capacity, service reliability, and vulnerability, as poorer communities might experience versions of water scarcity even outside of drought periods (OECD, 2021; Krueger et al., 2025; Madani, 2026a). This means that while the end of the official drought period might be announced, it does not mean that water insecurity has ended equally for all residents (Krueger et al., 2025; Madani, 2026a).

Water scarcity is not only an equality issue in relation to physical capacity but also monetary capacity. As tariffs, desalination, reuse, and groundwater development all can create financial pressure, it becomes an issue of affordability and justice when the solutions increase costs for residents. Hence, long-term resilience does not just mean securing more water but also means ensuring that water remains affordable for their residents (OECD, 2021; Madani, 2026a). This is something that the later CCT documents come to discuss, and provides assurance that everyone will have access to at least 50 litres of water per person per day but that those who exceed this will have to pay for the excess.

CCT's later documents frame water scarcity as something that needs to be planned for long-term, not just responded to when it occurs. The concept of water bankruptcy introduces the idea that crisis language might not be sufficient when water limits become long-term, as 'crisis' can imply a temporary disruption followed by a return to the perceived normal (Madani, 2026a). This is not to argue that Cape Town is experiencing water bankruptcy, but rather that CCT's later documents reflect a broader shift that the concept identifies as necessary for the future of water governance: moving away from reactive crisis management and temporary language toward more adaptive forward-looking planning. In this sense, the concept is relevant to the case of Cape Town as it helps interpret CCT's increasing emphasis on resilience, diversification, adaptive planning, and long-term governance under the conditions of climate uncertainty.

## *7. Conclusion*

This thesis has examined how the City of Cape Town's institutional framing of water scarcity changed between 2018 and 2025. The thesis finds that water scarcity in Cape Town initially was framed as an immediate crisis or emergency but became increasingly framed as a long-term governance challenge. In 2018 scarcity was primarily framed through survival language and focus on behavioural compliance to reduce consumption during the Day Zero crisis. In later documents, however, scarcity is framed through climate uncertainty, infrastructure, diversification of water sources, affordability, and systemic urban resilience. Nevertheless, the shift is not entirely linear, crisis language does not disappear, and neither does resident responsibility but instead they are increasingly placed within a broader institutional discourse of preparedness, governance, and resilience.

These findings provide a starting point for deepening the understanding of how shifts in institutional discourse may affect society. Further research could examine how residents

responded to CCT messaging, or compare CCT's discourse with that of the national government or another drought-affected city to broaden the scope of analysis. Another avenue for further research would be to examine whether institutional framing matches the actual policy implementation. Such research could help clarify whether changes in official discourse are reflected in public experience, intergovernmental coordination, and material water governance outcomes.

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