The Geography of Inequality in Cape Town: A Case Study of Access to Water in Khayelitsha.

University of Cape Town

DISSERTATION

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First, “I bring part of the first harvest from this land that you, Lord, have given me.”

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// Abstract

Section 27 (1b) of the Bill of Rights under the Constitution (1996) of the Republic of South Africa states that: “Everyone has the right to have access to sufficient food and water …” This section is preceded by section 26 (1) which states that: “Everyone has the right to have access to adequate housing.” Violation of these fundamental human rights in isolation may apply to a vast category of people. However, the residents of Endlovini in Khayelitsha find themselves at the intersection of oppressions informed by the simultaneous infringement of both these rights. For these residents, inequality in access to safe clean drinking water is directly informed by their location and informal housing status.

This is a difficult position to be in because the people of Endlovini are neighbours to Litha Park, a recognized formal section of Khayelitsha whose residents enjoy relatively adequate access to quality water, and whose water services are astronomically better than those rendered in Endlovini. This disparity is immediately written off as a class issue. However, this study finds deeper links between geography and water inequality. This study uses John Rawls’ theory of justice to highlight water inequality in Cape Town. The study uses qualitative research methodologies through fieldwork conducted in the formal settlement of Litha Park and the informal settlement of Endlovini in Khayelitsha, to illustrate that there are inequalities in how people within the same township access water, but both settlements are still marginalized, compared to the wealthy suburbs of Cape Town.

Interviews were conducted with the residents of both settlements, as well as officials from the City of Cape Town’s Water and Sanitation Department to gather data and address the research question: “How does the City of Cape Town’s response to the water crisis further perpetuate water inequality in the impoverished communities of Khayelitsha?” Key findings revealed that water inequality in Khayelitsha may have been created by apartheid spatial planning, but is sustained by the disregard for poor communities by the local government through unequal, anti-poor service delivery that continues to disenfranchise residents who live in informal settlements through poor water services.

The study, whose main objective is to highlight the disparities in water access and services received by the different locations within the township, adds to the body of knowledge on inequality in water access by providing a focused comparison between different kinds of settlements within the same township; to highlight the difficulties in applying Rawls’ justice theoretical framework where existing research focuses on comparing townships as a monolith to the suburbs.

Keywords: water inequality, informal settlements, justice, Khayelitsha

List of Abbreviations and Acronyms

CoCT - City of Cape Town

DHS - Department of Housing and Settlements

DWA - Department of Water Affairs

DWAF - Department of Water Affairs and Forestry

DWS - Department of Water and Sanitation

EPWP - Expanded Public Works Programme

EWS - eThekwini Water and Sanitation nit

IEC - Electoral Commission of South Africa

IMF - International Monitory Fund

JMP - Joint Monitoring Programme for Water Supply and Sanitation

L - Litre

MDGs - Millennial Development Goals

NGOs - Non-Governmental Organisations

OHCHR - Office of the United Nations High Commissioner for Human Rights

RDP - Reconstruction and Development Programme

SDGs - Sustainable Development Goals

UDL - Urban Development Line

UN - United Nations

UNEP - United Nations Environmental Programme

UNICEF - United Nations Children's Fund

WASH - water, sanitation and hygiene

WCWSS - Western Cape Water Supply System

WHO - World Health Organization

WMDs - water management devices

WSAs - water services authorities

WSS - water supply and sanitation

WWF - World Wide Fund for Nature

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Chapter 1: Introduction

1.1 Background of the Study

Water is one of the most important natural resources that sustain life and is recognized as a fundamental human right by International Law (UN, 2010). Securing access to clean safe drinking water for all is pivotal to the sustainable development agenda and Sustainable Development Goal 6 seeks to: "Ensure availability and sustainable management of water and sanitation for all" (UN, 2015). This mandate guides many countries' water policies. However, global water scarcity limits governments' abilities to protect their citizens' basic rights to water and sanitation.

Water in South Africa is a politicized resource that is often used as a social and political tool by politicians and community leaders to increase their political power (Ntobeko & Mpahla, 2000). The power to decide who has access to water and the level of access one has is negotiated through a network of actors at the local, provincial, and national level. The basic human right of all citizens to safe clean drinking water is enshrined in the Constitution of the Republic of South Africa (1996) and implemented by the Free Basic Water Policy. These instruments address the racial injustices that reserved basic services for white South Africans under apartheid laws and overlook the economic inequalities that made water a privilege, allocating 6 000L of free water a month to poor households (DWAF, 2001). This allocation, however, is vulnerable to water scarcity and does not mean continued access when there are droughts, even though high-income areas are accommodated.

There are two main categories of water scarcity, being physical water scarcity and economic water scarcity (Chitonge, 2020). Physical water scarcity occurs in areas without natural water resources like deserts and is often the result of prolonged dry periods (Chitonge, 2020). Economic water scarcity refers to a state in which there are sufficient water resources that are being poorly managed and vulnerable to contamination and diseases due to pollution, overuse, and conflict (Chitonge, 2020). Many peri-urban communities do not have a healthy relationship with water because they have never experienced consistent water management from their local governments. Damaged pipes and malfunctioning sewage infrastructure in informal settlements are not responded to with urgency, if at all; thus reducing the importance of saving water in the communities' eyes. Water scarcity forces poor people to source water from alternative and often unsafe sources for domestic use because of a lack of natural capacity.

In addition, investment in water infrastructure and human capacity to meet the demand for water in low-income areas is not prioritized, exacerbating the effects of scarcity (Santos Pereira, Cordery & Iacovides, 2009).

Sub-Saharan Africa holds about 9% of the world's fresh water but this is not relevant, as the region is still regarded as water poor because the unmitigated availability of water is very little as compared to water infrastructure and management; including the ability to store, convey and allocate water across competing uses (Calow & Mason, 2014:6).

South Africa is a water-scarce country with a highly commercialized water provision framework in which the national government sells water to the local municipalities, who then have the autonomy to decide which households qualify for Free Basic Water provisions, and this comes with a host of problems. Firstly, municipalities draw up their own water governance policies, and because of historic racial and spatial inequalities, these policies are not inclusive and do not provide for the basic water needs of the most impoverished (Wilson & Perret, 2010; Cooley, Ajami, Srinivasan, Morrison, Donelly & Christian-Smith, 2013; Sutherland, Hordijk, Lewis, Meyer & Buthelezi, 2014).

Secondly, these water governance policies are geared towards cost-recovery and conservation. This model treats water as an economic good and creates more inequalities compared to the rights-based model that views water as a social good. During water-related disasters, these inequalities become pronounced and most residents then have curtailed or no access to basic water services. South Africa experienced the worst drought in a century in 2015-2018, and this put an enormous strain on water resources, especially in the Western Cape province. The effects thereof were felt disproportionately by the residents who live in informal settlements on the Cape Flats. The water crisis highlighted how water inequality can take on diverse manifestations in the seemingly homogenous informal settlement communities of Khayelitsha, as residents were subjected to water shortages when they were receiving less than 4% of the City's residential water budget even before the drought.

Khayelitsha is home to some of the biggest informal settlements in South Africa and was created by the apartheid state in 1983 as a low-cost housing development project for black working-class South Africans who served predominantly as the domestic labour pool for white city dwellers (Seekings, Graff & Joubert, 1990). Ndingaye (2005) defined informal settlements as, "places where people live informally in generally irregularly shaped shelters made of

corrugated metal sheets, used scrap metal, and plastic". The City of Cape Town defined them as "unplanned settlement on land which has not been surveyed or proclaimed as residential, consisting mainly of informal dwellings (shacks)" (Housing Development Agency, 2013: 7). South Africa's National Housing Code defines informal settlements as characterized by illegality and informality, inappropriate locations, restricted public and private sector investment, poverty, vulnerability, as well as social stress (DHS, 2009). Khayelitsha checks all the boxes and the residents have challenges accessing services as basic as clean safe drinking water because of the implications of these definitions of informality on the treatment they receive from the local government.

1.2 Study's Approach to Water Inequality

Water inequality is framed as inequity in access to water and sanitation resources and services (Calow & Mason, 2014). This access is considered in two dimensions that are treated separately even though they are interlinked. The first is access to water for essential uses of drinking, hygiene and sanitation and access to "water for life", which requires small volumes of water (Calow & Mason, 2014:2). The second dimension is access to water for economic purposes and large-scale production: access to "water for livelihoods" which demand larger volumes of water (Calow & Mason, 2014:2). While there is no single definition for water inequality, it can be described as the unjust and unequal distribution of opportunities of access, services, and water resources. Global discourses on water inequality are concerned with the quantity of available water resources and not how these resources are distributed disproportionately and who is on the margins of this unequal distribution. As such, priority choices lead to the challenges of access to water for livelihoods as greater access leads to economic gains because larger players are the people present in policymaking processes and they hold power over socio-political life because of their contribution to economies.

The South African government, as is the case in many developing nations, cannot achieve universal access to water due to an array of limitations; hence, there is still the issue of inequality in access to water for life. One of the ways to measure water equality can be by the number of people with piped access within a certain distance of their homes, and Cape Town has far too many people who do not have direct access to piped water. Statistics South Africa's (2017) latest household report reveals that 3.7% of South African households do not have access to a reliable water supply and have to fetch water from streams, rivers, and stagnant bodies of water.

This is significantly lower than the 2016 report by the World Wide Fund for Nature which found that at the national level, 8.8% of households did not have access to piped water and this percentage was made up of people in rural areas and informal settlements, with 37% of the water supplied by local municipalities in these areas being lost to leakages as a result of old infrastructure (WWF-SA, 2016:64). In 2011, 0.9% of the residents of the Western Cape had no access to piped water and were living below the 25 L per person per day provision made by the Free Basic Water Policy (WWF-SA, 2016:88). Improving access to water would reduce water inequality. However, this is not happening in the city because improving access would mean an increase in demand which would prove too costly to meet; thus it falls outside the cost-recovery scope of the city's water governance.

The inequality in water services experienced by the residents of Khayelitsha expresses itself in more ways than limited access to water. The conditions in which the residents source their water are also unfavourable and this undermines the quality of the water they can access. The lack of regular maintenance of the aged water conveyance system that services Khayelitsha means that there are frequent pipe bursts which lead to water running to waste. This wastage is then used as an excuse to justify the local government's water shortages targeted at informal settlements. In addition, the City of Cape Town also cited this wastage as the motivation behind the installation of water management devices across various sections of Khayelitsha, forcing residents who would otherwise qualify for free basic water to pay for water because they live in high wastage areas.

Moreover, the department responsible for water services is jointly responsible for water and sanitation services in the city, and as such, these two divisions negatively influence each other where a backlog in water services means a backlog in sanitation services. Water inequality has a direct impact on the daily lives of the residents beyond their volumetric access to water, and shapes community life.

1.3 Problem Statement

The Western Cape province of South Africa experienced its worst drought in over a century in the period between 2015 and 2018, with 2017 receiving the lowest rainfall on record (Wolski, 2018). The effects of this drought were felt across the whole province, but especially in Cape Town as the City of Cape Town had to implement water restrictions to encourage water conservation in an attempt to ensure that the city did not run out of drinking water as dam levels

drastically dropped to unprecedented levels (Wolski, 2018). The people who suffered the most were the residents of the informal settlements who were already marginalized. There was unequal prioritization of residents when it came to water service delivery and maintenance, and the water restrictions meant that the poorest members of society had minimal, if any, access to safe clean drinking water, even though they were consuming far less water than households in the middle-income areas. The water crisis and the inequalities it exposed received significant media coverage, and there is a plethora of literature on water scarcity and access from different parts of the world. However, the theoretical assumptions and proposed solutions do not fully appreciate the experience of informal settlements with water scarcity, and thus water inequality.

The mitigation and adaptation efforts to avert the infamous Day Zero[1] fostered even more inequality in an already unequal society. The city remains divided according to apartheid spatial planning which maintains the barriers between the developed well-serviced areas and the informal settlements, fostering the geography of inequality. Moreover, the residents who made up the population of the areas regarded as unrecognized informal settlements were not able to engage with the municipality's campaigns that attempted to explain the implications of the crisis because this communication was framed in language that was inaccessible to most residents, excluding them from the important discussions about the city's water situation. This further hindered the residents' access to water and led to inequality in access to water in areas that were most vulnerable because of historic spatial inequality.

This study sought to theorize these disparities and make meaning of how spatial design facilitates water inequality through inadequate water conveyance infrastructure; and interrogated how access to knowledge affected access to water for residents in informal settlements. There is a disjuncture in how residents of both the formal and the informal settlements relate to water, and this is informed in part by the spatial planning system that renders some parts of the informal settlement as recognized with some kind of service delivery framework, while other parts are still unrecognized with no services at all. The study is important because it offers a new reading of the historic problem of water scarcity in the city by considering geographical location as the site of inequality.

[1] For the City of Cape Town, possible Day Zero refers to the day when most of the water supply system is switched off. Residents will need to collect 25 litres of water per person per day from points of distribution (PODs) located across the city.

Central to the study's framing of water inequality is the use of legislation and instruments by the various national and local departments to provide water to poor households in particular. Informed by the verdict in the *Mazibuko* court case (2009), this study recognizes that the Free Basic Water Policy set unrealistic goals and the monthly allocation of 6 000L is inadequate. A critique of John Rawl's theory of justice illustrates how the principles of justice do not promote equity in access to water in Cape Town's townships and informal settlements. This study proves that distributive justice as a theoretical framework does not promote equity in the allocation of water in Cape Town, and this is useful, as much of the research conducted alludes to one dimension of justice or another, in attempting to address the water situation in the areas that form the Cape Flats.

1.4 Focus and Scope

This study investigates water inequality in Khayelitsha by comparing the fact and level of access to adequate water resources and services in the formal settlement of Litha Park against the informal settlement of Endlovini. Water inequality is often conceptualized in terms of differences between suburbs and townships. However, this study highlights the importance of recognising that inequalities also exist within the townships and affect people in close geographical locations differently. The study began in 2018 at the end of one of the worst droughts in the history of the Western Cape province and analyses the residents' experiences with water in the aftermath of a water crisis and a national state of disaster. The communities investigated have similarities in that the majority of the residents migrated to Cape Town between the 1980s and early 2000s from the Eastern Cape, in pursuit of opportunities and a better life; thus most are black people of Xhosa ethnicity. Some have moved around Cape Town before settling in Khayelitsha, and when Litha Park was formalized, they were able to build or buy homes with adequate water and sanitation infrastructure in areas that are regularly serviced.

On the other hand, some of the residents live in informal settlements because they were unable to attain the opportunities they had hoped for, and thus found themselves without permanent homes and without the option of going back to the Eastern Cape. Many had been living in other informal settlements in Khayelitsha before 1997 when Endlovini was founded. They created communities in these informal settlements and cemented their presence as residents of the city, who were as fully eligible for the basic services as all the other residents who are receiving these services.

This study argues that the water situation in Endlovini is deliberately being ignored by the local government because the majority of the residents cannot and do not pay for water services. Apartheid spatial planning is the reason why water infrastructure in Khayelitsha is poor, and the communal taps installed in the informal settlement of Endlovini have not been fixed since the initial installation in 2000. However, the emergence and subsequent formalization of sections with good infrastructure like Litha Park is evidence that the geographical inequality the local government cites as a hinderance to service delivery is not insurmountable as it is clearly possible to upgrade the infrastructure. The residents of Litha Park receive better water services and access to water resources because they pay for water, while the city neglects the residents of Endlovini because they live in an informal settlement and are not paying for water services.

1.5 Research Questions and Objectives

The available theoretical assumptions and proposed solutions to water inequality do not fully appreciate the experience of informal settlements with water scarcity. Considering this assertion, this study's objectives are to:

- explore the unique relationship the residents of Khayelitsha have with water, especially during periods of scarcity.
- identify and evaluate the social dynamics that foster the unequal distribution of water resources that maintain oppressive structures and systems in the City of Cape Town. This is crucial for the study to add nuance to the unilateral discussion of the water crisis in Cape Town, using distributive justice as a framework. Lastly, the study seeks to:
- highlight the disparities in water delivery caused by the people's different locations in Khayelitsha, with the intent of starting the conversations that can lead to the establishment and adoption of alternative policies concerning water distribution, to equitably benefit all people living in the city, regardless of their location and social/economic status.

1.6 Research Questions

The study is guided by one main research question, and four sub-questions whose answers will come from the interviews to be conducted, as well as observations from fieldwork.

Main question: How does the City of Cape Town's response to the water crisis further perpetuate water inequality in the impoverished communities of Khayelitsha?

Sub-questions:

- How do the residents of the different settlements of Khayelitsha make meaning of, and experience water scarcity?
- Why is there unequal distribution of water across the different residential areas of the City of Cape Town?
- What roles do spatial and income inequalities play in sustaining unequal access to water in informal settlements?

To answer these questions, the study deploys qualitative research methodologies to understand and explain the level of access to water resources and services residents in informal settlements have, compared to their counterparts in the formal sections of Khayelitsha. Semi-structured interviews were designed to enable the participants to narrate their own experiences and recollections, and were later analysed thematically, to present these experiences as empirical data. The researcher's observations and informal conversations with the participants were also used to understand the spatial inequality that was difficult to put into words by most of the participants. A qualitative research approach was chosen as the methodology best suited for this study because the approach reinforces an understanding and an interpretation of meaning as well as the intentions underlying human interaction. It was crucial to conduct fieldwork for this study with care and sensitivity to prioritize lived experience over theoretical assumptions; to amplify the participants' narratives and analyse concepts from this experience instead of forcing personal narratives to fit neatly into preconceived notions of informal settlements' experiences of water.

1.7 Rationale

This study proposes a grassroots experiential knowledge-based approach to the study of water inequality in peri-urban spaces; in a way that will express the voices of communities that have always been overlooked and, in some instances, stifled. The local political environment has no room for the marginalized residents of informal settlements, and their plight for dignified service delivery is only heard around election time, and never really addressed. The informal settlements are perceived and treated in terms of informality and illegality, and these biases

compromise the quality of services the residents receive, despite the existence of provisions by national government to ensure that all residents receive free access to basic services.

Informal settlements are a permanent feature of the urban space, and the post-colonial, post-apartheid South African city offers us a unique story of formation and a more nuanced observation of this global phenomenon. As such, one would expect government dedication in uplifting informal communities, with the ultimate aim of upgrading, but that is not the case.

Fully valid and dignity-worthy human beings continue to live lives defined by illegality and informality. Not only do their living conditions deny them the full human experience, their citizenship and belonging in the country is ridiculed as they are excluded when it comes to service delivery. Their most fundamental human rights of access to adequate clean water and sanitation services are constantly being violated, and they are made to feel like an anomaly in their own birth country.

It is this paper's position that water inequality in informal settlements is perpetuated by the local government but is maintained by the whole community. Residents in neighbouring settlements who have unrestricted access to water treat and speak of their neighbours without access using the same terms of informality that the government has defined them by.

This study addresses this gap in literature in water inequality in Khayelitsha, which is arguably a similarly experienced condition across most townships and peri-urban areas in South African cities. The study is centred around the lived experiences of the participants in the water inequality debate by focusing on the spatial planning of Khayelitsha as a point of inequality access to water resources and services. This study identifies spatial inequality, coupled with the exclusion of poor communities from water provisions and services by the municipality as the biggest contribution to water inequality. Additionally, the study was conducted in both Litha Park and Endlovini to highlight the internal differences that sustain water inequality. Existing research tends to compare and contrast Khayelitsha's experiences with water to the experiences observed in the suburbs of Cape Town, and while this is useful work, that approach often portrays the township as one big monolithic entity, and this study specifically challenges that notion.

The study goes further and notes some of the marginalization faced by residents of Endlovini in how their neighbours in Litha Park speak about them in the same tones of illegality whereby the city portrays and treats them. There are clear disparities in the way that the local

municipality responds and reacts to the complaints lodged by the residents of Endlovini, where there already exists the challenge of basic access to clean drinking water, in comparison to complaints from Litha Park. This inequality is masked as a class disparity because residents in Litha Park pay for water while those in Endlovini do not. However, this expression of water inequality is rooted in the questioning and undermining of legitimate citizenship that informal communities are subjected to.

There exists a growing body of work on water inequality in Khayelitsha, and this study builds on the works of Enqvist and Ziervogel (2019), Kongo (2019), Mahlanza, Ziervogel and Scott (2016), Rodina and Harris (2016) and Rodina (2016), by providing a localised and nuanced study of inequality in access to water in Khayelitsha and surrounding informal settlements. The main findings speak to the cost of water and the neo-liberal practice of commodifying water through the installation of water management devices in low-income areas (Harvey, 2007). For many households, water is purchased on a prepaid basis, and when the households run out of water, they often cannot top it up until they have the finances to do so. Drawing from case studies from Soweto in the City of Johannesburg (Harvey, 2007; Dugard, 2009; Maphela & Cloete, 2019), and Dunoon in the City of Cape Town (Mahlanza *et al.,* 2016), this study incorporates the discussion of the commodification of water in the debates around the water governance policies that affect Khayelitsha. The primary contributing factors to the problem of access to quality water in South Africa is the underlying economic inequality that has left the black majority population without the financial means to afford to pay for water as well as local governments that provide water services on an economically motivated basis where cost-recovery and sustainability outweigh the rights-based social and environmental justice motivations for water provision.

This study unpacks the value and power of conducting research within a single seemingly homogenous study area to denounce the presumption of townships as monolithic spaces. By keeping both bases of comparison within Khayelitsha, this study highlights how the experiences of people in informal settlements such as Endlovini are aggravated by their exposure to their wealthier neighbours who enjoy access to water resources despite the fact that the city claims that water services in Endlovini are poor as a result of the location of the settlement. Moreover, the residents are not represented in policymaking, and conversations around water occur in spaces that are inaccessible to them. The disregard of the residents of Endlovini is echoed in Litha Park where their neighbours also perceive them as illegitimate

residents. This is particularly problematic as the people who represent Litha Park at the local government cannot relay the problems faced in Endlovini because they are not their own lived experiences, and thus are neither relatable nor relevant.

1.8 Choice of the Study Area

Khayelitsha lies on the Cape Flats, a geological area characterized by predominantly unconsolidated sand, and thus is prone to flooding and an inability to retain rainwater (Turok, 2001). This makes Khayelitsha vulnerable to infrastructure challenges that prevent the efficient supply of water and sanitation services. This coupled with the legacy of colonialism and apartheid has left Khayelitsha with archaic apartheid spatial planning, which has had the worst effect on the most impoverished residents living in the unrecognized informal settlements of Khayelitsha. While water is unequally distributed across the City of Cape Town with the wealthy residents in the suburbs being prioritized over the residents in poor areas, inequality also exists among the low-income areas and that is why this study identified Litha Park and Endlovini as the study areas. Litha Park is a recognized formal settlement of Khayelitsha that is home to the middle class of Khayelitsha. Endlovini, across the main road from Litha Park, is an unrecognized informal settlement, founded in 1997 by residents, coming from already saturated formal settlements, who then settled into shacks.

Both Litha Park and Endlovini are supplied with water by the City of Cape Town but have contradicting experiences regarding access to water. Access to water in Litha Park is through a network of taps in each home, with an absence of street taps because each household has at least three taps whose usage is monitored by water management devices. Water in Endlovini is supplied through street taps and standpipes that are shared amongst the households with no less than ten households relying on one communal tap. In addition, households in Litha Park purchase water through several billing plans while the residents in Endlovini do not pay for water.

In this context, the residents in Litha Park are privileged; predominantly because of their social capital in the community which means that they are also treated with respect and urgency when they lodge complaints with the City's Department of Water and Sanitation, while their counterparts in Endlovini have to wait weeks or months for a routine concern such as a malfunctioning standpipe to be addressed. However, all of Khayelitsha, including the wealthy neighbourhoods of Litha Park fundamentally experience unequal access to water and services

from the city, compared to their counterparts in areas such as the Southern Suburbs and the Atlantic Seaboard. The installation of water management devices in low-income areas like Khayelitsha was an expression of this inequality because these devices were used during the water crisis to curb water usage in the low-income areas but not in the wealthy areas where water consumption was high, even with water restrictions in place. Water restrictions and water cuts are also only experienced in low-income areas.

1.9 Overview of the Structure of the Study

The study is divided into seven chapters, with the first three exploring the theoretical and conceptual considerations of the topic. These chapters weave together social theory and existing literature on the study topic and conceptualize water inequality, in order to enable the researcher to extract meaning from the data collected. The fourth chapter acts as a bridge between the theoretical chapters and the empirical chapters. This chapter sets the parameters for conducting meaningful research and outlines the design and suitable research methods for data collection. The last three chapters are empirical in that they revolve around the collection and interpretation of data. These chapters first deduce meaning from the results, and through analysis then derive meaning from the results. They also place the results in the broader debates on water inequality globally and at the case study level. These chapters translate empirical data into knowledge and illustrate why this research is of value. An overview of the individual chapters will follow.

Chapter 1 introduces the general topic and goes into the specific focus of the study and then provides contextual background to the study and frames and addresses the research questions and objectives, the justification for the study and states its significance. Lastly, it declares the parameters and limitations of the study, as well as providing an overview of what the study entails.

Chapter 2 reviews the existing literature and situates the study within the broader debates on water inequality at the global, national, and local levels, zoning in on access to water in the informal settlements. The chapter measures water inequality by examining the accessibility of clean safe drinking water, and the affordability of water services. This chapter identifies the difference in water services experienced by poorer communities as opposed to their wealthy counterparts. This disparity, caused by spatial inequality inherited from colonial and apartheid

city planning, is an important factor that results in other inequalities that maintain water inequality.

Chapter 3 outlines the theory of justice and the concept of inequality together, to answer the research question. This chapter critically analyses John Rawls' (1971) theory of justice against the water inequality in Khayelitsha and develops a critical interpretation to the theory of justice that explores the ways in which Rawls's principles of justice can be applicable to Khayelitsha.

Chapter 4 details the methodology and profiles the case study areas (Litha Park and Endlovini) to investigate the residents' level of access to water and water services. In this chapter, the points of divergence that create the inequalities in terms of access to water, water infrastructure and water service delivery in both Litha Park and Endlovini are identified. The chapter outlines and justifies the qualitative research methodological approach to this study and details how data collection occurred using in-depth interviews with the chosen residents of Litha Park, Endlovini, and the City's Water and Sanitation Department representatives, at their offices in Belville.

Chapter 5 presents the data for analysis. The data was then analysed thematically to contextualize the participants' experiences of water inequality. The chapter incorporated observations and field notes made by the researcher and structured interviews conducted with participants from the study areas; as well as officials employed by the City of Cape Town's Water and Sanitation Department to arrive at the findings. These findings were then linked to the main themes from the literature and the conceptual framework, in preparation for the discussion chapter.

Chapter 6 begins with the research questions in mind. It derived meaning from the findings and explored the works of other researchers in the study field to locate the study and establish the significance of the findings. This chapter placed the findings in the context of the discourses on water inequality and explained the recurring themes and emerging perspectives in the water inequality discourse within the South African context set against the backdrop of the wider continental and global discussion of water inequality.

Chapter 7 summarised and concluded the study, acknowledging new questions emerging out of the study and the potential future research around these questions. The chapter then offered recommendations for tangible changes that could be adopted to begin the just redistribution of

water resources and services in the City of Cape Town as far as informal settlements in townships are concerned.

1.10 Limitations of the Study

The scope of the study began and ended with identifying points of inequality in access to water by the residents of Endlovini and Litha Park and it did not concern itself with other neighbouring settlements. As such, the small sample size is identified as a methodological limitation to the study, as well as a lack of prior research in the case study area, given how "young" Endlovini is. The biggest limitation of the researcher was access to the study area. However, the researcher relied on key informants who were known and respected in the communities to serve as the pathway to the other participants. The study overlapped with the deployment of the military in the general Cape Flats area, and while there was no military presence in the specific case study areas, the presence of the military on the Cape Flats did exacerbate crime across the Cape Flats as a whole, affecting the level and flexibility of access to the study area.

The second limitation was the language barrier between the researcher and the participants. The researcher did not speak fluent isiXhosa and the majority of the participants were older women who did not speak English or any other language the researcher is fluent in. However, the researcher was assisted by a resident who served as a translator and introduced the researcher to the key informants.

1.11 Conclusion

Unprecedented population influx leading to overcrowding, underdevelopment, and poorly maintained basic water and sanitation services and infrastructure are not unique to Khayelitsha. However, there is an assumed homogeneity when research is conducted in "informal settlements". Communities in informal settlements are marginalised and have, due to the violent ways in which the settlements were formed, always had challenges with access to basic services (OHCHR, 2018:14). Informal settlements are the othered spaces that are contradictory to the developed suburbs and other parts of the city with efficient public services and infrastructure. The narrative of informal settlements is that of lack and hopelessness, as such; the research does not engage with the location-specific problems of each area because, as researchers, we think all informal settlements present the same characteristics because of the theoretical models we use to study poverty and other social ills.

Poor water supply in Khayelitsha is not solely because of the shortage of natural water bodies in and around the City of Cape Town. Backlog in service delivery prevents the city from meeting its water demands and this disproportionately affects the residents in informal settlements who do not get preferential treatment because they cannot avoid paying for water services. Recognizing the deliberate and systemic mechanisms of exclusion that are in place highlights the water inequalities that exist between the various communities of Khayelitsha, this research's case study being the most explicit example. The inequalities in access and quality of available water are firmly rooted in spatial inequality and exist primarily, while not exclusively, because of colonial and apartheid city planning. However, these inequalities are being sustained by negligence from the local government, and this has a profound influence on community perceptions and attitudes towards the residents in informal settlements and their right to free basic water.

In focusing on the diversity-thus inequality- in the neighbouring settlements of Litha Park and Endlovini, this study denounces the packaging of Khayelitsha as a monolithic experience and offers nuance and contrast to the debate on water inequality at street level; looking to show that neighbours can have contradictory access to water in informal settlements. The idea is that the title of informal settlement carries with it connotations of informality, illegality, temporality, and indiscriminate justice and water infrastructure and services, and ultimately access, due to these disparities. All of these aberrations are not immediately visible at first glance, and that is exactly why this was the ideal case study area.

Chapter 2: Theoretical and Conceptual Framework

This study weaves the theory of justice and the concept of inequality together, to answer the question "how does the City of Cape Town's response to the Cape water crisis further perpetuate inequality in Khayelitsha?" The theory and concept will be used to aid the analysis of the data collected; in order to show that historic spatial planning continues to prevent the City's poorest citizens from accessing water. The chapter offers a critique of Rawls' (1999 [1971]) theory of justice, to argue that applying his conceptions of justice would not lead to equitability in access to water in the City of Cape Town. Drawing from Bentley's (1973) reflections in *John Rawls: A Theory of Justice*, as well as Berkey's (2016) critiques in *Against Rawlsian Institutionalism about Justice,* this study offers a critical interpretation of Rawlsian justice that may be applied in the study area to promote equitable access to water. The chapter will end with a discussion of spatial inequality to highlight the factors that make Rawls' conceptions inapplicable in the case of Cape Town.

2.1 Introducing 'A Theory of Justice'

John Rawls' (originally written in 1971 and with a 3rd edition in 1999) theory of justice deals with distributive justice, which is founded on socially just distribution of goods in society. Rawls utilizes a variant of conventional social contract theory and draws from the philosophy of John Locke, which makes it a political theory of justice as opposed to other theorizations of justice. Rawls asserts that "justice is the first virtue of social institutions" (Rawls, 1999:3). As a theory, however, it cannot be treated as absolute and needs to be rejected if it fails to explain this assertion. Justice sets a precedent for the inviolability of every member of society that cannot be overridden, even by the collective welfare of the society (Rawls, 1999). By this means, justice prevents the loss of freedom of some for the greater good of the others. In a just society, the majority does not get to enjoy certain privileges at the expense of the minority. Justice is uncompromising and the liberties of equal citizenship and the rights secured by justice are not subject to political bargaining or negotiation on, grounds of social interest.

Rawls (1999) looked at the principles of justice to assess the theory of justice in line with what he had identified as the role of justice. To do this, we ought to take a society as being a self-sufficient association of persons on a cooperative venture for mutual gain. Despite the mutual recognition for cooperation, there will always be an identity of interests and a conflict of interests. The identity of interests exists because those belonging to a particular grouped

identity have a better chance at gain/benefit than those operating individually. The conflict of interest arises out of the inherent indifference in the distribution of benefits. The principles of social justice provide a way of assigning rights and duties in society and defining the distribution of benefits and burdens of social cooperation.

The principles of justice are not linear and because societies are not ideally ordered, there is seldom a public conception of justice in which everyone accepts and knows that everyone else knows and accepts the same principles of justice, with social institutions that are known to satisfy these principles in place. In addition, what is just and unjust often compete and individuals do not always act in unison. However, individuals have a conception of justice that determines the appropriate distribution of rights and duties, as well as their benefits and burdens. Therefore, the principles of justice single out the similarities and differences that are relevant for determining distribution of benefits.

This is a challenge for a society as polarized as Cape Town, where we can go so far as suggesting there are multiple societies that exist because of the contrasting racial, economic, and political displacements. The problem is that these societies are governed by varying principles, yet are subject to the same set of regulations when it comes to water services. These regulations and trends of provision favour the white, wealthy self-proclaimed liberals, while leaving the black and coloured majority economically and politically marginalized, without having a similar level of access to basic water provisions.

2.1.1 Rawls' Principles of Justice

The principles of justice that Rawls introduces form a tripartite system, with lexical preference given to which principle comes first, because the order in which they are chosen is of significance in understanding the theory of justice. It is also important to understand under what circumstance each principle is relevant. This is determined by the Original Position which is a hypothetical bargaining situation from which people choose the principle(s) that will set up the basic structure of society. In this position, people are assumed to either be behind the veil of ignorance, or that they possess rationality, and are able to reach unanimous agreement on a principle. The veil of ignorance "excludes the knowledge of those contingencies which sets men at odds and allows them to be guided by their prejudices", making the conditions fair (Rawls, 1999:17). Under these conditions, Rawls argues that the people will rationally and impartially choose just principles that are general in form and universal in application, thus,

his principles prevail, because "the parties start with a principle requiring equal basic liberties for all, as well as fair equality of opportunity and equal division of income and wealth" (Rawls, 1999:130). If there are inequalities that yield the greatest satisfaction for the least disadvantages, the people would accept the inequalities. These principles will be critically examined individually against access to water in Cape Town.

2.1.I.1 Equal Liberty **Principle**

The Equal Liberty Principle guarantees equal basic or constitutional liberties for all citizens (1999). Rawls argues that certain liberties are more important than others, thus requiring to be protected such that not even governments may disregard, amend, or remove these rights and freedoms. This study posits that the right to clean safe drinking water for all is one such liberty. Hence, it is enshrined in the South African Constitution, and the realization thereof as implemented through the Free Basic Water Policy. This is also regarded as a human right by all relevant international bodies and intergovernmental organisations, as well as prioritized by the United Nations Environmental Programme (UNEP), as one of the Sustainable Development Goals (SDGs). The Equal Liberty Principle takes lexical priority over the equality principles.

2.1.I.2 Fair Equality of Opportunity Principle

The Fair Equality of Opportunity Principle is the first of the equality principles and holds lexical priority over the Difference Principle. Rawls (1999) justifies this by stating that inequalities cannot be arranged to maximize the share of the worst off, without allowing access to positions and offices for all. The Fair Equality of Opportunity Principle holds that social and economic inequalities are to be arranged so that they are attached to offices and positions open to all, under conditions of fair equality of opportunity (Rawls, 1999). This should be such that same scenarios of success in the competition for positions of advantage that distribute primary social goods are equally present (Arneson, 1999). Arneson (1999:78) argued that the Fair Equality of Opportunity Principle can be regarded as an extension of the ideal of non-discrimination which, in the civil society realms, overcomes "bigotry, race hatred, misogyny, class division, and similar evils". Not only should individuals have the right to opportunities they should have an effective equal chance, regardless of their social background or race, sex, and gender.

Arneson's (1999) critique of the Fair Equality of Opportunity Principle starts by interrogating the role of socialization by inviting us to imagine a society in which access to positions of

advantage such as jobs and places in schools satisfies Fair Equality of Opportunity. However, this society has also been socialised to subscribe to the ideology that it is inappropriate for women to aspire to positions of advantage, thus exclusively affords these opportunities to men. While any man and woman with the same natural ability and ambition may have the same prospects for success, socialization unfairly supresses the ambition of the woman, tilting success in the favour of the man (Arneson, 1999:78). Arneson (1999) argued that removing discrimination by ambition does not solve the problem, instead proposing that Fair Equality of Opportunity be amended to demand that (a) any two individuals with the same natural talent and ambition should have the same prospects of competitive success, and (b) that the education and socialization processes that influence the formation of individual ambitions are not prejudiced against or in favour of a particular type of individual.

Drawing on examples in which discrimination by race and gender yielded higher profits or following for certain organisations, Arneson (1999) illustrated how a society might satisfy the Fair Equality Principle even though opportunities favour racism, sexism, gender-based oppression, and many other oppressions. If we apply this thought in the context of water access in Cape Town, we can see that the immediate oppressions are racial in nature but express themselves through spatial and economic inequality.

The distribution of water follows the racist and anti-black apartheid infrastructure and thus does not adequately service informal settlements. These areas are also low-income areas, in a city whose water governance policies are geared towards cost recovery. The commodification of water makes it an economic good, and because of capitalism and socialization, those who cannot afford to pay for water are led to believe that they do not deserve water. Thus, in supplying “paying customers”, the city has provided fair equal opportunity to access of water for those with the same ability and ambition; in this case being favourable geographic location and economic privileges.

Arneson (1999:81-82) then rejected the lexical prioritization of the Fair Equal Opportunity Principle over the Difference Principle. The Fair Equal Opportunity Principle equalizes skills levels amongst individuals having the same natural talents, to allow equal opportunity to those in advantageous positions, given that they have the same ambition. If the worst-off individual is untalented, as Arneson (1999) stated, prioritizing the Fair Equal Opportunity Principle over the Difference Principle as the latter practises injustice on the untalented individual. Fair Equality of Opportunity should not trump the adjustment of provision mechanisms that ensure

that the worst-off members of society have access to social goods and economic benefits. Arneson (1999) took this argument further and rejected the Fair Equal Opportunity Principle entirely, because it came into conflict with the Difference Principle. Arneson (1999) proposed that we view the Fair Equal Opportunity Principle as a means to improve on the Difference Principle that should only be accepted, provided that its satisfaction fulfilled the Difference Principle also.

2.1.I.3 Difference Principle

The most widely studied of the principles is the Difference Principle which holds that the only instance where injustice is tolerable is when that injustice is the only way to avoid a greater injustice (Rawls, 1999). The Difference Principle regulates and maintains inequalities in the distribution of certain social and economic benefits if the inequalities improve the conditions of those worse-off; whose circumstances would not have changed under strict equality (Rawls, 1999). Under the Difference Principle, a marginal benefit for a "single worst-off person should be preferred to an enormous gain in wellbeing that would be enjoyed by many better-off persons" (Berkey, 2016:84).

Rawls was concerned with the absolute position of the worst-off and not their position relative to the well-off. As such, the Difference Principle does not call for material equality, but rather for a society in which everyone has access to basic liberties, and fair access to opportunities; according to their specific contexts without domination by any group (Knight, 2014). Ultimately, the inequalities permitted by the Difference Principle cannot contravene fair political liberties.

Rawls' first objective is to secure equal liberties, and Knight (2014) argued that by complying with the Constitution (1996), political liberties in South Africa are secure. However, Knight (2014) questioned state power and the militarization of police during (service delivery) protests. The final objective is to ensure that distribution of benefits maximizes the income and wealth of the worst-off, which is realized through the Difference Principle (Knight, 2014). Knight (2014) asserted that South Africa has made notable progress in achieving this, citing access to clean water and electricity in rural areas as a marker of this progress. However, if we consider the size of the population that falls under the worst-off category, this progress is less apparent. As such, the Difference Principle is criticized as counteractive because the weighting Rawls assigned to the worst-off is too strict (Berkey, 2016).

The Difference Principle calls for economic adjustments to improve the material reality of those in the worst-off groups, and in South Africa, these are in the form of free basic municipal services, including water and electricity to poor households. The Free Basic Water Policy provides poor households with up to 6 000L of free water per household per month. To qualify for this, households must meet their municipality's means test to be classified as indigent, and the individual municipalities provide either 100% or a fraction of the free basic services, based on the individual households' levels of need and the criteria set by the municipality. To be regarded as indigent, a household's total income must be R4 500 or less per month, and the market value of the property must be R300 000 or less (Ouweneel, Winter & Carden, 2020).

The Free Basic Water Policy works in low-income households that are part of the municipality's grid, for water, electricity, and sanitation services. Even if we assume that these economic adjustments will allow people free access to basic water, the principle still does not afford people in informal settlements any or better water services because they still live where they live and, although water is free, it is not always easily accessible, as many households rely on communal taps which are far from their homes and are not well maintained. In applying the Difference Principle in this context, it is implied that the only way to ensure fair distribution of water would be to begin building houses in informal settlements in their current location, that are equipped with efficient water and sanitation infrastructure, or to move them to a new location with existing efficient water and sanitation infrastructure. Both these options, and the various forms thereof, have been rejected because the state simply does not have the capacity to deliver them (Knight, 2014).

2.1.2 Critique of Rawlsian justice

Rawls' principles of justice have been used widely. However, they have also been criticized for various reasons. Focusing on the institutional nature of Rawls' theory of justice, this study applies the principles of justice to water distribution in Cape Town, to illustrate the limitations of the principles in real life application, outside the imagined ideal society in which Rawls developed the principles. Rawls's "veil of ignorance" protects and facilitates a questioning of how we arrive at which principles of the moral contract, so as to ensure the delivery of principles of justice that are deemed correct. This is "fairness as justice" in practice and illuminates two important features of Rawls's theory. Firstly, justice according to Rawls, can exist without rightness or righteousness, and this is apparent in the Difference Principle's quest to foster inequality, which may not feel fair to the privileged group upon which the burden of

compromise falls. Secondly, he is only concerned with describing the ideal social arrangements that would be engendered by adherence to his principles of justice. This feature is the most contested element of the theory because it cannot, and perhaps should not, be adapted to the real world, because people are not necessarily rational, free, or just. Effectively, the theory is imaginary, and this raises the question of applicability. Berkey (2016) concurred with Bentley (1973), that Rawls ignored existing societies and focused on creating hypothetical ideal institutions which do not yet exist, such that the theory cannot be applicable in real life. In addition, the "veil of ignorance" means there is no clarity as to what would they have been offered to agree to the terms.

Rawls's theory argued that the principles of justice apply only to the institutions of the "basic structure of society," and do not apply directly to the conduct of individuals (Berkey, 2016). Berkey's critique bases itself on the problematic characteristics of institutionalism, as he states Rawl's principle of justice as Rawlsian institutionalism and draws on the impacts well-off people living in unjust societies with unjust basic structural institution have on society. Institutionalism, according to Berkey, prescribes that individuals are guided by the principles of justice blindly, when they are in a position to contribute to the establishment of institutions without too much cost to themselves, wherein their voting behaviour has no consequences for them. To arrive at this point, Berkey (2016) first considered the reasons Rawls placed so much importance on institutions and weighed those against the positions of other scholars in favour of institutionalism, as well as providing some criticisms of institutionalism.

Institutionalism limits the demands that can be made on individuals for the sake of justice. For Rawls, this is important, as individuals in these structures can achieve their ends with the security that the social system is protected from exploitation (Berkey, 2016). This approach to justice has been argued to be concerned with limiting the demands made on the well-off to make sacrifices for the redistribution of resources (Berkey, 2016). However, this stance is contested by the argument that the presence of institutions is not to cushion the well-off but is simply utilized because no individual (including the well-off) has the capacity to oversee justice. Therefore, just institutions are necessary to ensure that there is "background justice" and to afford societies the means to coordinate the adjustments necessary to achieve the just distribution of benefits and duties (Berkey, 2016:711). In the case of water service delivery and access, it is important to have centralised systems of distribution to avoid the targeting of low-income areas in the cutting of water supplies during water crises. More specifically, a city like

Cape Town can enforce indiscriminate water cuts across its different settlements in order to match consumption and ensure fair distribution of the responsibility of water conservation, as opposed to the current trend of limiting the water supply to the Cape Flats where the larger portion of the population is already consuming less water.

Borrowing from Küng's (1984:237) Marxist critique of Rawls' Difference Principle, "… in a just society somebody's being better off than others can be justified only as far as his being better off simultaneously improves the lot of the worst off." The Difference Principle calls for inequality when it is beneficial for the greater good. This principle creates inequality by improving an individual's circumstances and not necessarily by decreasing access for those who have what is needed in abundance.

Contextualising justice in terms of inequality is problematic because the idea of a "worst off" and a "well off" are subjective, and this would result in further marginalisation of the people whose experiences of the informal settlement is not typical. For example, some people managed to install taps in their homes, however, they are still affected by the periodic cuts to water supply even though their access to water can be argued to be better than most. If the City of Cape Town improves the availability of water, the greatest benefit goes to the people who already have taps in their homes and not to the whole community. As such, there can be no inequality that is acceptable, even in the event of redistribution of resources, unless it is facilitated by institutional transformation.

If the acquisition of positions in institutions follows the Equal Opportunity Principle, then the presence of the institutions does not serve the worse-off because they are not able to compete for these positions; thus their interests and needs are not represented, and this is apparent in the City of Cape Town. To be able to run for public office in South Africa, one has to be nominated by one's ward to serve on the Metropolitan Council, the Local Council, or the District Council. While any ID-bearing citizen of South Africa can be nominated, these elections are highly politicized and candidates running under the flag of a political party stand a better chance than independent nominees because party politics stifles the democratic process.

As such, the candidates who end up being elected are known and respected members of the community, and because of the divergences this research has highlighted between formal and informal settlements, these elected leaders cannot come from the informal settlements. The researcher argues for a reimagination of Rawlsian institutionalism, in which the means used to

set individuals' eligibility to compete for offices and positions would be redefined at the grassroots level. By doing so, the communities that make up individual settlements get to be represented in localised institutions. In addition, there is no need for these localised institutions to form part of larger centralised institutions or to be absorbed into national institutions as this has been the norm that has sustained inequality by favouring certain groups.

The fact that water is recognized in the Constitution (1996) as a basic human right means that if we were to apply Rawls' principles of justice, all the local municipalities in South Africa would meet the conditions for the Equal Liberty Principle. The Free Basic Water Policy obligates the government to provide free access to water, to meet the most basic water needs of most impoverished households. However, implementation of the Constitution-mandated provision of water is poor and favours the predominantly white wealthy residents. Thus, the local government in Cape Town is not doing enough to ensure that every single citizen enjoys their constitutional right to water. The main reason water inequality in Cape Town thrives is because of spatial inequality, coupled with unbalanced distribution of water between informal settlements and the rest of the city. Both of these issues can only be addressed by the local government, and there is apparent negligence and a reluctance to prioritize the city's most vulnerable, based on the technical understanding of what constitutes a formal, legal human settlement, thereby further infringing on people's liberties.

To correct this, the representatives would have to be members of the very communities with limited access because the current community leaders are and represent people in formal settlements and are so far removed from the lived experiences of the people in the informal settlements that they cannot address the needs of these residents. The politics of electioneering means that the conditions for running for public office are not fair and just; and thus they interfere with true representation within local governments, and this skewed representation makes its way to the national parliament. The institutionalism advocated for by the Fair Equal Opportunity Principle does not account for socialization and the weaponizing of human rights into electioneering tactics.

As such, the principle would not engender equality in access to water. Applying the Difference Principle to tilt the distribution of water in favour of the people who live in informal settlements would not mean equal distribution because the spatial limitations would still exist. The government can increase the amount of water that is allocated to the informal settlements, but this would not change the circumstances especially for poorer people; because even though

they would then have unlimited water supply, their carrying capacity would remain the same as each household can only collect a limited amount from the communal standpipes.

2.1.3 Limitations in the application of Rawlsian Justice

While keeping with the notion of justice separate from utility, Bentley (1973) reflects on the distinction Rawls draws between the concept of and the conceptions of justice. Rawls proposes a conception of justice, meaning the principles that determine what rational and free persons would accept as correct/right in pursuing their own interests, while ensuring equality. According to Rawls, two such principles exist. The first principle requires equal distribution of basic rights and duties, the second calls for fair equality of opportunity to be secured, and the third principle holds that social and economic inequalities are only just if it means providing benefit to the least advantaged. This is the conception Rawls terms "justice as fairness" (Bentley, 1973).

Following their critiques of Rawls's theory of justice, several thinkers have proposed modifications to our understanding of justice as a theory. Bentley (1973) suggested we plot Rawl's position against utilitarianism because the "defence of truth and justice" lies in the hands of the utilitarian. As a moral theory, utilitarianism is concerned with ensuring the greatest good for the greater number of people. Bentley (1973) then acknowledged the possible implications this stance might have had on the conceptualization of justice in relation to morality, and on whether justice is governed by the principle of utility. Drawing from Hart (1961), Bentley asserted that it is possible to be driven by utilitarian ideals and still strive for justice. Hart (cited in Bentley, 1973) carefully distinguished fairness, (pegged to justice by Rawls (2001), from morality, and asserted that fairness covers justice.

Utilitarianism calls for the maximization of all society (Knight, 2014). To achieve this, the existing inequality in the volumes of water distribution across the different parts of the city would have to be overcome first. This particularly is a challenge because the amount of water that provides utility for a household in Khayelitsha is not the same amount that provides utility to a household in Newlands. However, applying utilitarianism at a micro level could produce a different outcome. If the targeted area is Khayelitsha and the aim is to bring the volumes of water distributed in all of Khayelitsha to an equal level, a more favourable result may be observed because the amount of water that provides utility to a household in Litha Park is not

that far off from the amount of water that provides utility for a household in Endlovini because the familial structures, and thus the rates and levels of consumption, are similar.

Knight (2014) contextualized data sourced from the South African Institute of Race Relations post-apartheid in the framework of distributive justice and noted that black households had an average expenditure of R45 000 per annum while white households' average expenditure was R235 000 per annum, with white personal income on average eight times higher than black personal income (Knight, 2014:1). Viljoen's (2016) comparative analysis of water consumption in informal settlements, low-income areas, and middle/high income areas studied the water consumption trends of these areas to identify the water needs of households in the same income category across different geographical areas. Data from Endlovini and four other informal settlements indicates that each household uses up to 41 L of water per day (Viljoen, 2016). Average daily water consumption in low-income households was up to 56 L and households with WMDs installed used 5% less. Medium/high income households consumed up to 55 L or 65 L a day, with the presence of WMDs installed, and 29% more if there were additional buildings in the property (Viljoen, 2016). While these statistics do not reveal the personal usages by the individuals living in the households, it is clear that people in informal settlements use up to 20 L less than households in high-income areas, to accommodate approximately double the number of inhabitants.

Viljoen's (2016) study found that depending on the income category, the households had varying levels of access to alternative sources of water. In the informal settlements, 8% of the participants reported using rainwater, and 25% used grey water (Viljoen, 2016). Almost half of the participants in low-income households (40%) had access to alternative water resources, including spring water and ground water, in addition to rainwater and grey water, and the households using ground water consumed up to 79% less than those using other alternative water resources. Only 30% of the medium/high income households had alternative water resources, with 14% using rainwater and 13% groundwater (Viljoen, 2016). These disparities led to the conclusion that there is no reason for households in the medium/high income areas because access to water is guaranteed because service delivery is consistent in these areas, and if the municipality fails to provide water services, the residents can afford to buy bottled water in large quantities. In the low-income households, the biggest incentive for exploring alternative water resources is to reduce water bills because some of the residents cannot afford water, as service delivery in these areas is mostly unreliable. Most households in informal

settlements need alternative water resources because they cannot rely on the municipality to provide water, and it is safer to have options closer to their homes than exposing themselves to danger, when walking to fetch water from communal taps.

Viljoen's (2016) findings, like Knight's (2014), exposed water inequalities that are fundamentally racialized from the level of access to water, to the affordability and quality of water services; especially when comparing low-income households with medium/high income households. Viljoen (2016) recommended that WMDs be monitored closely, especially in low-income stands that have backyarders so that this is taken into account when calculating water usage strictly per "household"; and for these stands to have additional standpipes so the cost of water is distributed fairly. One of Knight's findings was that the existing racial affirmative action policies need to be replaced with affirmative action that benefited the poor (Knight, 2014). Following this line of thought, this study argues that these adjustments, particularly in the distribution of public goods like water, need to be at the micro level where racial and geographical inequalities are not a factor.

2.1.4 Rawlsian justice in Khayelitsha

In theory, the Difference Principle would yield success in redistributing water resources in Khayelitsha to ensure that the worse-off households of Endlovini benefit. However, applicability of the principle destabilizes the current social arrangement of the city, which consequently would not be popular or agreed to by the structures that benefit from the current order, even if they would not be disadvantaged. Rawlsian justice does not promote equity in water access in Khayelitsha because the greatest good does not lie with the greater population but rather with an elite minority that effectively monopolizes resources in the affluent parts of the city.

Rawls's theory perpetuates the prioritizing of the minority elite, whereas utilitarian principles would mean that the poor would be favoured and that meeting their water needs would generate the greatest good. The distributive nature of this theory inherently calls for a redistribution of resources and with water, this would mean ensuring that every household, regardless of geographical location and legality status, would receive the basic 6 000L per household per month, as stipulated by the Free Basic Water Policy before large consumers are allowed to buy 'additional' water. Given the finite availability of water, this may result in the curtailing of

consumption in the areas that are able to buy more water, to ensure that the basic needs of all people are met first.

The initial spatial planning of the Western Cape, much like the rest of South Africa, did not have equity as a goal of development. Hence, the distribution of water in the City of Cape Town remains unequal because it follows the model of service delivery which made resources available to white and affluent coloured residents who historically lived on the West Coast, in the Northern Suburbs, Helderberg, the Southern suburbs, the City Bowl, the Atlantic Seaboard, and the South Peninsula.

Furthermore, the policies and frameworks that informed the city's future development remain ignorant to the historical role Khayelitsha was created to play in the politics of segregation. The city is working towards sustainable development, but it is within the problematic universal notion of urbanization, which is an aggressive approach that is anti-poor. As such, the current development model does not leave room for any form of redistribution that the Difference Principle would achieve.

However, the dismantling of apartheid and the subsequent redistribution and development programmes by a new democratic government and Non-Governmental Organisations (NGOs) provided the city with the opportunity to begin phasing in inclusive water distribution models. Instead, the local government maintained the segregation by "developing" informal settlements with the intention of eventually upgrading them to formal status, without trying to incorporate people living in these areas into the core economic and political life of the rest of the city.

The effectiveness of justice as a principle relies on morality and that is the entry point for Bentley (1973), who argues that Rawl's theory of justice can be read through the ethical theory of utilitarianism. Adopting a utilitarian approach to service delivery in the City of Cape Town is unjust because the utility is afforded to the economic "majority", and this is not the true majority in terms of the numbers. Institutionalism allows the wealthy individuals in the city to exploit the institutions at a cost to the poor, but with no consequences.

In its original form, Rawls' theory is concerned with a hypothetical social contract for a hypothetical world where people are rational, free and just; and this is not applicable in the real world because disobedience exists and therefore there can be no absolute adherence to the principles of justice. However, considering both Bentley's and Berkey's positions, this chapter illustrates the inapplicability of the principles of justice if we consider them as functions of

utilitarianism and institutionalism that could foster justice and manipulate inequality to secure basic water provisions for all, in the City of Cape Town.

2.2 Conceptualizing Inequality

Inequality as a concept is at the centre of all social theories and is commonly presented either as an economic measure of living conditions, or as a rights-based framework that measures people's political and legal influence. Geographic apartheid, or spatial inequality presents itself in multiple dimensions, and the most impactful is the physical dimension. The physical arrangements, hindrances, and piping infrastructure maintain water inequality at a deeper level than physical barriers preventing residents from accessing water.

For example, in Endlovini people have to share a tap with up to ten other households, yet just across the road is a settlement of bonded properties where each house has a minimum of three taps installed in and around the house. This is a unique expression of spatial inequality where an assumption is made by service providers and government that a monolithic situation prevails. Services such as water are distributed on a hybrid model that combines rights-based principles of justice while being aware of the financial implications of commercialization. These models create inequality in access to water as income plays a fundamental role in where people are placed or choose to settle and what kind of services they will receive.

Spatial inequality in the City of Cape Town is a direct result of efforts to alleviate poverty by providing low-cost housing on the periphery of urban spaces (Maylam, 1995). These housing projects follow the city layout model that was created by the apartheid state that reinforced segregation, not only in racial terms but also in the distribution of natural resources and general service delivery, including water. Within the historically named Non-White racial category, disparities exist on the grounds of ethnicity, which is often disregarded because there is a tendency to homogenise the various peoples who make up the category of people of colour.

The exclusionary use of language when communicating the water crisis in Cape Town was the main reason why there was a separatist mode of understanding when it came to what the residents of Khayelitsha were expected to contribute to relief efforts. Because almost all the residents of Khayelitsha do not speak English as either their first or home language, many do not understand it at all. For those who do speak English, the use of hedging techniques and scientific jargon to explain water scarcity was and remains a tool used to exclude residents

from discussions, which increases inequality as people cannot question what they do not understand.

While the city does engage community leaders, this is done in ways that leave the "average" citizen unaware of the important decisions made on their behalf. Mahlanza *et al.* (2016) found that many residents clearly did not understand the implications of having water management devices installed, but the city officials did not explain it to them adequately and made them sign for the water management devices even though they failed to understand how they would affect their access to water.

In addition, the residents adopted the same language that the city used when referring to them (Rodina & Harris, 2016). The residents of Litha Park are seen as paying customers, and this is reinforced in the relatively swift attention they get when there are problems. They in turn, see themselves as legitimate residents entitled to services because they pay for them, and they view their counterparts in Endlovini in the same lens of illegality and illegitimacy that the city perceives them. The city's response to water-related problems in Endlovini is characterised by temporary actions, and this is evident in the installation of communal taps and toilets instead of attempting to issue a tap to each individual household, as was done in Litha Park, or increasing the number of existing taps, in order to minimise the number of households dependent on each tap; as well as the distance – and thus exposure to danger - residents have to travel to fetch water.

Rodina and Harris (2016) found that the people who lived in shacks in the informal settlements of Khayelitsha perceived themselves as "'less-than' full citizens", due to the fact that water provision in Khayelitsha followed the formalization of housing processes, which were characterised by Reconstruction and Development Programme (RDP) houses being equipped with water and sanitation infrastructure. As such, they perceived the state as neglectful because their most basic needs were not being met. This argument was used to support the findings of this study, specifically in the case of Endlovini.

The conceptions of inequality discussed in this chapter directly contribute to water inequality, the most impactful being the inequalities that are engendered by living in an informal settlement in the "Global South", particularly in a sub-Saharan country; a region known for droughts and poor infrastructure. There is far less water allocated to the informal settlements than any other area of the city, in periods of abundance and the residents of Khayelitsha are

among many who have to carefully ration their water even outside of periods of scarcity and crisis. They are also the first to be placed under water restrictions in crisis periods with prolonged and irregular water cuts, while their counterparts in the affluent parts of the city who consume much more than they do are not as heavily affected by water restrictions. This inequality expresses itself in a unique way when we analyse the treatment people in formal settlements receive; compared to those in informal settlements. When comparing the townships and the Southern Suburbs, one would assume that with the passing of time, there would be fewer points of oppression, but that is not the case. While structural racism affects both formal and informal settlements, class differences are responsible for the disparities in people's access to water.

2.3 Conclusion

This chapter critically analysed John Rawls' theory of justice against water provision trends and patterns in the City of Cape Town in order to assess water inequality in Khayelitsha. Foregrounding the theory of justice is the idea of utilitarianism, and with this as the middle ground between justice and inequality, the chapter went on to offer a critique of Rawlsian theory that better explains the water situation in the area of this study. Bentley's (1973) reflections in *John Rawls: A Theory of Justice*, as well as Berkey's (2016) critiques in *Against Rawlsian Institutionalism about Justice* were used to critique the theoretical soundness of Rawls' principles of justice, because the current conceptualization of Rawls' principles of justice do not promote equity in access to water between the informal settlements and other areas of the City of Cape Town.

Rawls' motivation for introducing inequality in order to attain the just distribution of (public) goods does not apply in Cape Town. However, the critical interpretation of Rawlsian justice may be useful in illustrating how the historic spatial planning of the City of Cape Town continues to prevent the city's poorest citizens from accessing water. The chapter ends with a discussion of the concept of inequality to deduce the impacts of spatial inequality and the deployment of language as a tool of exclusion on water inequality in the City of Cape Town.

Chapter 3: Literature Review

3.1 Introduction

The purpose of this literature review is to present and interrogate the body of literature on water inequality. It begins by performing a pragmatic analysis of water inequality, starting with global perspectives and examples, and ending with the literature on water inequality in Khayelitsha. For the purpose of this study, water inequality will be measured by the accessibility of clean safe drinking water. However, the literature reviewed uses various benchmarks for measuring water inequality, including poor water governance and scarcity.

3.2 Global Water Inequality

In 1990 the World Health Organisation (WHO) and The United Nations Children's Fund (UNICEF) established the Joint Monitoring Programme for Water Supply and Sanitation (JMP) to monitor and regularly report estimates of global, regional and national progress on drinking water, sanitation and hygiene (WASH). The JMP was responsible for tracking progress towards the 2015 Millennium Development Goals (MDG) target 7c and is also responsible for monitoring the 2030 Sustainable Development Goal (SDG) targets 6.1 and 6.2. Target 6.1 of SDG 6 aims to "by 2030, achieve universal and equitable access to safe and affordable drinking water for all" (UN, 2015). WHO (2008) stipulated 25 L per person as the minimum daily water consumption requirement for basic needs and is working with states globally to ensure that this is met. The MDGs and SDGs brought the global water crisis to the forefront of environmental and social discourse by presenting water as a social good. However, the initial literature emerged from a scientific perspective, and literature about the political ecology as a multidisciplinary field is relatively new. As such, the available literature on global water inequality does not present the global water crisis as a socio-political crisis, but rather as a socio-economic crisis.

3.3 Framing Water Inequality through Scarcity

The latest UN World Water Development Report (2019) proved that 2.1 billion people globally do not have continued access to clean drinking water (UNESCO, 2019). The report, aptly titled *Leaving No One Behind,* highlights that poor and marginalized people still do not have adequate access to water and sanitation. The findings of the Report expose the error in the thinking that people in slums do not have access to water because they cannot afford it. The

Report (2019:12) finds that half of the global population without access to water is in Africa, with 42% of sub-Saharan Africa still without access to safe clean drinking water. The report quoted a member of UNESCO Germany's board who touched on the relationship Germany has with global water supply, highlighting that although Germany had successfully secured water rights within its borders, the import of beef and cotton from other parts of the world had contributed negatively to water usage in those regions because the production of those products was water intensive and directly contributed to the deprivation of many people of basic human rights (UNESCO, 2019).

The effects of global water inequality are increasingly felt disproportionately, as cost-recovery models are implemented universally and states fail to modernise infrastructure to keep up with global trends. Moreover, failure to adopt country-specific water policies results in countries with efficient water and sanitation services charging their citizens less for water than countries with poor water and sanitation services, making access to clean drinking water even more difficult for those living in low-income areas. This failure in water governance is the reason for the "day zeros" Sarni (2019) noted that occurred in Australia, India, and South Africa.

Sarni (2019) concludes that there is no gap between the supply and demand of water, "only poor choices around allocation." The wealthy always have access to safe drinking water, regardless of the state of the water supply in any given country, while the poor pay far more for water of poorer quality. According to Sarni (2019), combating global water inequality demands consolidated global action. All stakeholders need to bring together best practice in securing a human right as sensitive as access to clean safe water. Moreover, Sarni (2019) argued that we need to adopt new ways of speaking about water scarcity; instead of centring on droughts, the discussions should be about the broader problem, which is the disparate allocation of water to businesses and the wealthy, as compared with the poorer element in our society. Lastly, access to actionable information, water data, and information on the quality of water should be democratized, so civil society is encouraged to participate in securing safe water and driving changes in public policy across the world (Sarni, 2019).

Chitonge (2020) mapped out the disaggregated orders of scarcity approach (OSA) to assess the nuanced and often overlapping factors that lead to water scarcity in South Africa, Uganda, and Zambia, to deepen our understanding of water resource dynamics. This approach breaks down water scarcity into four tiers or orders, to illustrate that water scarcity is the result of more than merely a shortage in the natural reserves of water but additionally, is directly influenced by

human and social causes. The approach comes out of the realisation that current global indicators of water scarcity often reduce scarcity to "physical absence of water resources in the natural environment", overlooking the anthropogenic factors that lead to water scarcity, many of which are tied to existing systems of inequality (Chitonge, 2020:2). The orders of scarcity can be further categorized into two groups, with first order scarcity being due to the natural absence of water resources, while the second group (orders two up to four) which refers to human-induced scarcity caused by factors including but not limited to inequality and poor governance. Chitonge (2020) concluded that disaggregating the orders of scarcity is crucial to thoroughly exploring the varying dimensions of water scarcity, to understand the political, social, economic contexts that scarcity arises from, in order to respond to water challenges globally.

Chitonge (2020) argued that the research and policy intended to mitigate current and the projected water scarcity challenges focused on the volumetric supply of water against the demand for freshwater, without much consideration of the dimensions of water scarcity. Using the example of the Democratic Republic of the Congo (DRC), Chitonge (2020:5) illustrated how a country with an abundance of renewable freshwater meeting the volumetric water demand can be 'economically water scarce' because it lacks the infrastructure to "make the available water accessible". By taking this into account, global indicators of water scarcity acknowledge *second order scarcity,* where scarcity arises out of inadequate infrastructure and not the physical shortage of water (Chitonge, 2020:5). However, the indicators of water scarcity do not go beyond infrastructure to include water scarcity as a result of ineffective institutions and this is identified as *third order scarcity*. Lastly, the *fourth order scarcity* frames scarcity as a result of social relations and political processes (Chitonge, 2020:5). All forms of water scarcity, especially the orders of scarcity that are human and socially induced, cause water inequality in informal settlements as the local government prioritizes the affluent areas when there is a restricted water supply.

Drawing on experiences from Kutch in western India in a study on water scarcity, Mehta (2013) assessed the inequality in how water scarcity is defined, and how it affects people from different parts of the world. Water scarcity has temporal and cyclical dimensions and there is a natural oscillation between periods of abundance and shortage (Mehta, 2013). Arid and semi-arid regions naturally experience water availability as uncertain and irregular, while tropical and Mediterranean climates may experience scarcity as a result of poor infrastructure, even if they

receive adequate rainfalls. The study places Kutch on the precarious intersection of both natural scarcity as a result of its climate, and scarcity as a result of poor water management. Mehta (2013) then discussed the inequality in access to and control over water resources, using an example of how people in Kutch consume and average of 10 L per day, while the average American consumes over 700 L a day. This analyses inequality in access to water across different states introduces a new dimension of water inequality at the global level, where citizens of more developed nations have a steady supply of water despite their countries experiencing severe scarcity, while those living in poorer countries have less control and access to water, even during periods of freshwater abundance.

We may draw another example from Nepal which, like many other countries, aligned its energy consumption and production outputs with the SDGs, and is striving to fulfil SDG 6; "achieving universal and equitable access to safe and affordable drinking water and provide access to adequate and equitable sanitation for all by 2030." (UN, 2015). To accomplish this goal, Nepal has to overcome geographical heterogeneity and the inequalities in its drinking-water supply and sanitation (WSS), to optimize disease control and resource allocation (He, Lai, Karmacharya, Dai, Hao & Xu, 2018). He *et al.* (2018) estimated spatial heterogeneity of access to improve WSS in Nepal and explore inequality within and between the relevant administrative levels to identify the specific areas that may require policy reform.

He *et al.'s* (2018) study is important because it pioneered geographical heterogeneity and inequality in water supply and sanitation in Nepal, with higher disaggregation than the administrative level, making it the most accurate way to deduce areas that need urgent attention. Their study found geographical heterogeneity and inequality of access to improved drinking water supply, which were not shown in existing national statistics (He *et al.*, 2018). Geographical heterogeneity in access to improved WSS can be the result of natural physical features such as mountains, population density and urbanization.

He *et al.* (2018) found that inequality is most pronounced between districts and within provinces and recommended district-level policy as most suitable in addressing these inequity issues and accelerating the achievement of SDGs. Their recommendation prioritized the most vulnerable populations and came at a time of decentralization in Nepalese administrative decision-making, which may be useful for policymakers and other stakeholders to address the issues of unequal access to improved WSS, ultimately aiming for universal coverage (He *et al.*, 2018).

There is an urgent need to deepen the contexts in which water inequality is discussed, in order to emphasize the need for correction of the inequality. For Mehta (2013) and Sarni (2019) this starts with rethinking ways of speaking about water scarcity because universal and essentialist definitions of scarcity do not encapsulate global experiences with water scarcity. In periods of dearth, scarcity is not felt universally as there is inequality over the access and control of water resources. Mehta (2013) argued that scarcity is socially and politically constructed as permanent when, in fact, by definition it is merely a cyclical period of dearth, temporal and predictable in the case of water scarcity. It is essentialized as a natural phenomenon to legitimize the construction of large dams in some countries, and to remove accountability for poor infrastructure from states in other countries.

3.4 Water Inequality in Africa

The continent of Africa is seemingly naturally abundant in freshwater with some of the largest rivers and lakes in the world found on the continent. However, there is an uneven distribution of this water where there is sometimes more water where fewer populations are, and fewer water sources where the bulk of the populations are. An example of this is the Congo Basin where 30% of Africa's water is found in land inhabited by only 10% of the continent's population (Naik, 2017:329). Individual countries also experience this uneven distribution of water, and water governance is used to redirect the flow of water to ensure that there is as much coverage as possible. However, water scarcity threatens this and is experienced across the continent.

The World Wide Fund for Nature (WWF) predicts that by 2025, almost 50% of Africa's population will face water stress (WWF-SA, 2016). Inequality in access to water in Africa is a result of scarcity and poor water management. Many African countries depend on water sources outside of their boundaries, and dams and water infrastructure are constructed to ensure that countries can share water, accelerating environmental degradation that leads to droughts and floods (WWF-SA, 2016).

This section will focus on Sub-Saharan Africa as a considerable amount of literature attributes the water inequality in the region as in part being due to climate change, issues such as the mismanagement of water infrastructures and resources, as well as a lack of commitment from political leaders to provide safe clean water for all (Chitonge, Mokoena & Kongo*,* 2020). Chitonge *et al.* (2020) found that many southern African countries are still dedicating much of

their efforts to improving water access in urban areas, as opposed to rural areas and this is one of the contributing factors to water inequality.

The growth of peri-urban populations and rapid urbanization means that states dedicate more of their resources to cities while they leave behind the most vulnerable communities in the rural areas. The allocation of resources to urban populations is still riddled with inequality as peri-urban spaces such as informal settlements are overlooked. This is due to the lack of government commitment characterized by institutional arrangements that redirect the allocation of water resources and services to the urban elite, ensuring that some marginalized groups live in scarcity, even in countries with abundant natural water resources (Chitonge *et al.,* 2020; Chitonge, 2020).

Ziervogel (2017) observed similar trends in Botswana and drew on experiences from the capital city Gaborone, one of the many Sub-Saharan cities that experienced a water crisis in 2015. As a semi-arid country, limited rainfall contributed to the drought in Botswana, however, urban population growth, poor water-demand management and infrastructure have also been cited as some of the main underlying causes (Ziervogel, 2017). The cities of Johannesburg and Pretoria also source water from the Lesotho Highlands Water Project through five dams, some of which are in the neighbouring Free State province (Piper, 2014). Gaborone, Johannesburg, and Pretoria are where the primary industrial activities occur and are predominantly home to the wealthy, hence they are priority areas for water supply. In addition, these arrangements mean higher water bills for the residents of these cities, thus making access to water minimal for those who cannot afford these increased water rates (Piper, 2014). However, the people who experience water shortages and overall poor water quality are those who live on the outskirts of the cities or, in the South African case, smaller countries like Lesotho where the water is sourced from.

3.5 Framing Water Inequality through Water Governance

Cooley *et al.* (2013) outlined the evolution of water governance and noted that despite water scarcity being a global issue, dimensions of water governance at the global level remain limited. Cooley *et al.* (2013) described the key elements of global water governance and defined the pathways through which stakeholders in the water sector operate. Their discussion concluded with recommendations after identifying the shortcomings of global water governance, that will ensure that the major water problems of the 21st century are addressed.

Effective and equitable water governance has the potential to address water inequality and ensure that water resources of the same quality reach all people, despite their socio-economic standing and location. One of Cooley *et al's* (2013) recommendations is the engagement of local communities in the decision-making process, and to develop transparent processes that ensure that inter-governmental actors are held accountable and consult with local governance structures.

Global water resources are experiencing pressure from climate change, population growth, and many other challenges. While the endowment of the planet's water remains the same due to the earth being a closed system, the quality of this available water is continuously declining, demanding costly treatment and jeopardizing ecological and human health (Cooley *et al.*, 2013). These challenges facing the water sector are complex and exceed national and regional ability to control them. Cooley *et al.* (2013) posited that water issues have become globalized, and thus require global and diverse stakeholders. The groundwork has been laid with physical infrastructure such as the construction of large dams and reservoirs to secure water supply. However, these efforts were still met with the challenge of access and many other socio-economic and political challenges, leading to the emergence of the discourse on water governance in the early 1990s (Cooley *et al.*, 2013). Following the first Water Development Report in 2003, the UN declared the global water crisis a crisis of governance, wherein states are faced with political, economic, and social challenges preventing them from governing water effectively (Cooley *et al.*, 2013). This shifted the scope of water governance significantly.

Early notions of water governance were primarily concerned with the role of government in water management through centralized systems (Cooley *et al.*, 2013). This has shifted to a more flexible approach that considers different levels of society, as the scope of water related challenges is increasingly becoming a global one.

Being aware of the negative impact of dams on society and the environment, stakeholders in the water sector began moving towards improved management of available water resources instead of securing new water resources. This led to the emergence of Integrated Water Resource Management (IWRM), a widely used theoretical framework that defines coordinated development and management of water, land, and other resources to maximize social and economic prosperity while preserving environmental systems (Cooley *et al.*, 2013). This framework, along with other policies has been formulated through regional and international summits and forums. Historically, most of the meetings have been UN-convened and framed

around the MDGs, which paved the way for the 2030 Agenda for Sustainable Development.

Citing examples from Uganda, Naiga, Penker, and Hogl (2015) highlighted the impacts of national-level institutional disturbances on local communities' ability to access safe drinking water. Their study followed a 1990 policy shift in Uganda from a supply-driven approach to a demand-driven approach to water provision in the rural areas.

They needed to track the impacts that the institutional framework had on collective action for long-term access. Naiga *et al.* (2015) noted that reported water coverage is actually much lower, due to the fact that there are dysfunctional water sources that are not accounted for, and the hypothetical nature of the statistical procedures followed in deriving coverage. This creates a water supply deficit that is attributed to a water governance crisis (Naiga *et al.,* 2015). Water governance is defined as the "range of political, social, economic, and administrative systems that are in place to regulate the development and management of water resources and provision of water services at different levels of society" (Naiga *et al.,* 2015:238).

The Constitution of Uganda (1995), through the Uganda Water Action Plan (1995) and the National Water Policy (1999), protects the development of water resources and recognizes the socioeconomic value of water in the water management policy, in line with the UN's declaration of sustained access to safe drinking water as a human right. However, Uganda's policy reform destabilised the local collective action that is necessary to maintain sustainable access to water. Naiga *et al.* (2015) attributed this to the inconsistencies and incompleteness within the decentralization process.

Local water governance in Uganda is disturbed by the expectations, conventions and structures of the supply-driven approach that the democratic state carried over from the colonial rulers (Naiga *et al.*, 2015). The supply-driven approach placed all responsibility on the state, and the sudden decentralization that comes with demand-driven supply distributed responsibilities to the local communities on the assumption that collective action at the local level had the desire and capacity to take over the supply and management of water informed decentralization; but this also created an unclear separation of roles and responsibilities (Naiga *et al.*, 2015).

The water governance crisis is due to insufficient public budgets, corruption, and public mismanagement and is managed differently across the various sectors. Naiga *et al.* (2015) argued that due to challenges in water provision technology, the high costs of water, and possible regulatory weaknesses, private water utilities evidently performed better than state-

owned utilities. However, privatization was contested due to the anticipated conflict between privatization and equity and the ambiguity of the roles of the state and the community ((Naiga *et al.,* 2015). Thus, community-based water management, or the demand-driven approach sits at a complex intersection between privatization and state provision. Hence, Naiga *et al.* (2015) noted that the bulk of the literature on water governance advocated for the inclusion and participation of local communities. They then interrogated this, raising the question of willingness to participate in public affairs or collective action, which is then contrasted with best practice reports from the literature on Costa Rican, Ghanaian, and Zambian local communities who have successfully operated and maintained local water infrastructures.

Demand-driven approaches operate through complex networks of actors and scopes and in Uganda, Naiga *et al.* (2015) argued that because this approach was initiated by the state, there were various actors with the goal of ensuring sustainable provision of safe water and bearing financial and policy responsibilities against a set of outcome indicators. Water user communities, mostly villages, had a significant role in the building and maintenance of point water sources which, according to Naiga *et al.* (2015) encompassed boreholes, protected springs, shallow wells and gravity flow systems. The water user community made monetary contributions towards the initial capital cost, provided the land on which the water sources were located, and were responsible for the maintenance and the operation of the infrastructure. Point water sources were wholly owned by the communities. However, the amount of subtractable water was limited, creating a competition over water usage.

Moreover, it was difficult to exclude any users, and this made the infrastructure vulnerable to misuse and overuse and some people benefited without contributing either to the installation or to the upkeep of the facilities. Naiga *et al.* (2015) therefore proposed that collective action was necessary to ensure fair use through mobilizing resources for operation and maintenance, as well as setting up and enforcing rules of usage. However, they cautioned that this method might not be realistic for many communities, and that water reforms are not always successful, as was the case in Uganda, due to decentralization. Community-based commitment and investment at the local level is an example of water governance practices that can curb water inequality when applied and regulated properly.

3.6 Water Inequality in South Africa

Cole, Bailey, Cullis and New (2018) performed an in-depth analysis of per capita water use across South Africa, to map water inequality across the country using piped water access, water use, and water stress as indicators. South Africa's official development indicator for sufficient water access is "households with at least 25 litres of potable water per person per day within 200 meters of a household, not interrupted for more than 7 days per year" (Cole *et al.*, 2018:39). Their findings showed that 45% of the population had access to piped water in/around their homes but this ranged from 0.07% to 100% at ward level. At national level, per capita water use is 208 litres per person per day on average but ranges from 8 to 2,414 litres per person per day at town level (Cole *et al.*, 2018:37). This shows a high level of inequality. It is a recurring observation as each of the indicators of inequality at local level is analysed and compared with national findings (Cole *et al.*, 2018).

Spatial disaggregation of social data such as income and access to water is particularly useful in South Africa as spatial inequality was established in the 1900s by the entrenchment of segregated development in the apartheid government's homelands and low-income urban and peri-urban areas which has been sustained ever since (Cole *et al.*, 2018). They conclude that social factors such as access to water and income have greater influence on per capita water use than biophysical factors such as rainfall and runoff.

Cole *et al.'s* (2018) finding is crucial to this research because it provides an in-depth analysis of water inequality in South Africa. Disaggregated data reveals inequalities that may not be fully reflected in aggregated data and this research examines the nuances of water inequality at the local level in Khayelitsha. What is not expressed in the literature is the residents' attitudes and perceptions to water and there is an opportunity for the study to fill this gap in knowledge on the social factors that entrench water inequality in South Africa.

Redefining water governance in the eThekwini Municipality in KwaZulu-Natal began with the rescaling of the responsibilities of local government in water service delivery in the low-income areas in and around Durban, which ultimately inspired the development of the Free Basic Water Policy. Sutherland *et al.* (2014) explored the discourse on four water governance issues that shaped water and sanitation provision reforms undertaken in the eThekwini Municipality post-apartheid. However, only three of the issues are reviewed in this study. They adopt a spatially differentiated approach in order to highlight the role played by apartheid

policies in how different parts of the municipality access water. This approach is also useful to capture the complex transformation of the city whose fast growth is shaped by the interactions between multiple social, economic, political, and environmental relations.

Cole *et al.'s* (2018) conclusion necessitates a discussion on inequality in water consumption. Different residents consume different amounts of water due to supply reliability (Howard & Bartram, 2003). Citing Zerah's (2000) study in New Delhi, Howard and Bartram (2003:20-21) asserted that low-income households experienced a more unreliable supply of water and that this was exacerbated by the fact that they did not have the resources to store large volumes of water at a time when disruptions in supply occurred frequently. Consequently, households in low-income areas consume less water. Discontinuity in water supply is not always predictable, and this inequality in consumption occurs in African cities where residents in low-income areas are forced to collect water at unsafe hours, due to the frequent and unpredictable interruptions in water supply (Howard & Bartram, 2003).

Howard and Bartram (2003:21) referred to a study in Ghana where consumption of lower volumes of water in lower income areas was directly attributable to over-consumption in higher-income areas. Thus it is evident that high consumption patterns in affluent areas can have a direct and detrimental impact on the volume of water available to poorer communities, thus reinforcing and maintaining water inequality.

Sutherland *et al.* (2014) began their discussion by providing a comprehensive history of water services in the eThekwini Water and Sanitation Unit (EWS) and the challenges faced there; including the argument by civil society and other stakeholders that the EWS did not adequately uphold "the right to water" enshrined in the Constitution of South Africa. Sutherland *et al.* (2014) noted a "pro-growth and pro-poor agenda" that left both national and local governments at odds when it came to a decision on whether service delivery is a rights-based discourse, or a neo-liberal cost-efficiency discourse.

Water is considered a social good at the heart of transformation and development in South Africa; so much so that it was enshrined in the Constitution as a basic human right a decade before the United Nations (UN) declared it a universal human right. This was implemented through the Free Basic Water Policy (2001), whereby each householder was entitled to 6 000L of free water per month. However, there is inequality in water and sanitation services provision because the rights-based distribution of water services clashes with the neo-liberal cost

approach. Sutherland *et al.* (2014) problematised the commodification of services and pondered on whether the focus of service delivery was on cost-recovery or on social and environmental justice.

The first two discourses that frame eThekwini's water governance and water service provision that speak to this study are juxtaposed to illuminate the inequalities municipalities engender when they try to provide free basic water in a sustainable way. The discourses of water as a human right, and as an economic good emerged in the early years following the dismantling of apartheid and have been institutionalized in the policy and practise of the eThekwini Municipality (Sutherland *et al.,* 2014). In the first five years post-democracy, the water supply programme was driven by the national government, through the Department of Water Affairs and Forestry (DWAF), and this responsibility was shifted to local governments in 2000 with the establishment of new local government institutions. Under the Municipal Structures Act (1998, Act 117), the responsibility for service provision was delegated to water services authorities (WSAs), which in most cases were municipalities tasked with the responsibility of progressively ensuring efficient, affordable and sustainable provision of water. The national government remained the provider and custodian of water, while the local governments were water users (customers). In 2008 the National Water Services Regulation Strategy was put in place, shifting the role of national government from "provider to regulator and referee, in an attempt to close the regulatory gap in the country where water systems and water delivery were not being adequately regulated and managed" (Sutherland *et al.,* 2014).

Sutherland *et al.* (2014) navigated the complex pressures that the EWS found itself under as the commodification and commercialization of the bulk water that the municipality received threatened to undermine the human rights discourse. Sutherland *et al.* (2014) argued that by referring to citizens as customers, the EWS draws ordinary people into the language of capital. Water governance is then shaped by the balancing of the two discourses as government attempts to address the inequalities of service provision from the past and simultaneously meet the growing demands in financially responsible and sustainable ways (Sutherland *et al.,* 2014). Sutherland *et al.* (2014) concluded that by significantly addressing backlogs in water provision since 1994 and leading the nation in free basic water provision, the EWS has shown commitment to the human rights discourse. However, they warn that the tension between free basic service provision and the need for cost-recovery is still present in water governance in the eThekwini Municipality (Sutherland *et al.,* 2014).

Out of the entanglement of the discourses of water as a social good, and water as an economic good, Sutherland *et al.* (2014:470) identify "the spatial differentiation of service provision" discourse which highlights the spatial patterns of inequality.

The influences of both apartheid and a demarcation process in 2000 are still felt in the social geography of the city today. Racial zoning plans produced by the Durban City Council in 1944 gave rise to the development of the large townships of KwaMashu, Inanda and Umlazi on the periphery of the city, designated for black people (Sutherland *et al.*, 2014). The national municipal demarcation process of 2000 led to the reconfiguration of municipal administrative boundaries aimed at reducing socioeconomic inequalities by spatially integrating underdeveloped and poor rural areas with better resourced cities and towns to allow for cross-subsidization (Sutherland *et al.*, 2014). This led to the formation of the administrative area of the eThekwini Municipality and an inherited new 60,000 households without access to the city's basic services. The Urban Development Line (UDL) was put in place to cope with the mixing of topology by promoting a smaller sustainable urban form that is sensitive to the spatial limit of development, based on infrastructure availability, while protecting agricultural resources and environmental services many households in the rural periphery rely on (Sutherland *et al.*, 2014).

Sutherland *et al.* (2014) stated that the residents of eThekwini Municipality "aspire to an in-house, full pressure water supply and flushing toilets linked to waterborne sewerage and wastewater treatment", provision of which the EWS argued is not feasible across the municipality, including the rural periphery as a result of technical, financial, environmental and political constraints (Sutherland *et al.*, 2014). However, the EWS has developed a spatially differentiated model for service provision to ensure that all citizens within the eThekwini Municipality get access to safe and affordable basic water supply and sanitation services. Residents within the urban core and the UDL receive full pressure water services and have flushing toilets linked to bulk wastewater treatment or privately installed septic tanks. Rural communities receive free basic water of 9 000L per month per household. However, informal settlements receive unlimited (unmetered) water provided through communal taps, and sanitation is either absent or is provided through state and community-built pit latrines and communal ablution blocks. In the event of absent sanitation facilities, residents use open land around the settlement (Sutherland *et al.*, 2014).

The eThekwini Municipality offers a unique South African experience where some peri-urban

areas were successfully integrated into the urban space. While the topography and city planning concepts have been transformed, the provision of water services still follows the apartheid city model that, like in Cape Town, leaves residents in informal settlements with none of the benefits of being regarded as urban or peri-urban dwellers. Sutherland *et al.* (2014) recorded high levels of mistrust of the local political system by the rural communities, who did not trust their elected councillors to address their basic needs, because of their awareness of the inequality in access to water services between the urban core and the peri-urban areas. Sutherland *et al.* (2014:485) concluded that the national government "empowers and co-opts communities through material provision but disempowers them in its engagement with ordinary citizens through the ward committee system," as the system has failed to facilitate participatory democracy.

Maphela and Cloete (2019) conducted a study to assess the domestic provision and consumption of water in Soweto, a township in the south of the City of Johannesburg. The study was conducted across three different suburbs to establish the water use perceptions and practices across different socioeconomic realities. The study took place in Region D of Soweto, which was designated as a mixed-income housing development where different socio-economic realities could be observed in households grouped into three categories: "the apartheid four roomed matchbox houses, the post-apartheid RDP houses, and bigger mortgage houses" (Maphela & Cloete, 2019:7). Johannesburg Water, owned by the City of Johannesburg, is the company that provides water and waste management services for the region with water purchased from the provincial bulk supplier Rand Water.

Maphela and Cloete (2019) problematized South Africa's water urban policy by arguing that the current conceptualization of the White Paper on National Water Policy is informed by the Water Act of 1956 which enforced racial segregation. The Water Act was drawn-up within the ideological framework of apartheid, and as such, the fundamental framework of the policy did not treat black communities and white communities equally. The implementation of the National Water Act in 1998 under the first democratically elected government was an opportunity to correct this and design an explicitly corrective policy that rigorously sought after improving the socio-economic rights of all, sanctified in the Bill of Rights of the Constitution (1996). The immediate post-apartheid years were crucial for the securing of basic services such as access to free basic water for the previously disenfranchised black population through instruments such as the Water Services Act of 1997 (Maphela & Cloete, 2019). Acknowledging

the role of public officials and politicians in the implementation of policy meant a concerted effort across the water sector to ensure sustainable water access for all, given the projected water shortages in South Africa's future. Maphela and Cloete (2019:1) argued that the aridity status of South Africa and the implications of climate changes on the availability of water should be considered when policy is drawn-up, to secure and manage sustainable water resources because water shortages are our present reality.

Maphela and Cloete (2019) found that households in Soweto resisted the implementation of the National Water Act because residents and the municipality had different expectations regarding water access and responsible usage. The study revealed that the residents in the mortgage households were reluctant to engage with the municipality because of the historical tensions between the apartheid government and the community. Additionally, Maphela and Cloete (2019) assert that these households did not pay for water because non-payment for services was an effective strategy that undermined the apartheid government. The residents of Region D believed that the municipality made and implemented decisions without consulting the communities affected by those decisions. Drawing from the Phiri court case, residents did not believe that the installation of water meters was lawful. However, councillors argued that there was no way of monitoring how each household used the free monthly 6 000L as per the Free Basic Water Policy, except through the water meters.

The study found the RDP households to be more receptive to the municipality, with the residents confirming that they received a monthly 10 000L of free water per household, which is the National Water Act's provision for RDP houses where other households are entitled to 6 000L of free water per month. However, Maphela and Cloete (2019) cautioned that there was no conclusive evidence that the residents understood the implications of the installation of water management devices in their homes. Maphela and Cloete (2019:11) noted that this observation contradicted the perceptions recorded in the apartheid matchbox households and the mortgage households where residents were struggling to understand that the installation of the water management devices was a mitigation strategy to curb "wasteful consumption of water." Maphela and Cloete (2019) concluded by calling on all residents across the different socio-economic realities to assume co-responsibility, compliance and cooperation with local governments' water management policy. This will improve the relationships between the residents and the municipality, leading to sustainable solutions to the water management challenge.

On the backdrop of the *Mazibuko* case, Dugard (2009) investigated the tensions between a rights-based model, and a commercialized model of water provision. The former is a progressive approach that treats water as a public good and service, while the latter treats water as a commodity and source of revenue.

The City of Johannesburg installed prepayment water meters in 2004 as part of a cost-recovery strategy (Dugard, 2009). Dugard (2009:176) argued that this aggravated an already irregular water supply system with supply problems and general inhumane treatment. The meters in Soweto's poorest communities have an 'automatic disconnection' feature which Dugard (2009) highlighted as unusual because other parts of Johannesburg had water meters that supply water on credit if households use more than the free 6 000L.

This is worsened by the fact that in wealthier suburbs, households have protections in place that notify them when they are in arrears and allows them to make payments before their supply is disconnected, a courtesy that is not extended to the residents of Soweto. Moreover, despite being aware that the largest water consumers were not the poor residents, the City of Johannesburg implemented water management devices in townships and informal settlements to "conserve water", while there were no plans to install restrictive devices on the institutions and companies that were consuming way above their allocation.

The inequality fostered by water meters went beyond water disconnections after a household had exhausted its Free Basic Water monthly allocation. Dugard (2009) discussed the social dynamics in townships where multiple families live on one stand. There is one meter installed per stand, regardless of how many households depend on that one stand. Dugard (2009:176) narrated the experiences of homeowners who leased additional dwellings on their stands to backyarders to illustrate how water meters did not take social arrangements into account as all the households on the same stand relied on the same 6 000L on the twelfth day of every month, irrespective of whether only one family lived there or more than one. Households in poor areas like Phiri are forced to go without water for extended periods because many cannot afford to purchase additional water once the prepaid water supply has run out.

Dugard (2009) used the *Mazibuko* applicants' iterations as an opportunity to frame water provision as a rights-based model. The applicants argued for a sustainable water supply and a management strategy that pursued social equity and guaranteed affordable tariffs to provide safe and affordable water to all, and revenue security by increasing tariffs for the consumers

who can afford them, such as businesses and high consumers (Dugard, 2009:177).

The *Mazibuko* case exposed municipalities' failure to adjust Free Basic Water Policy allocations to local realities and contexts, and the refusal of well-resourced municipalities like the City of Johannesburg to increase their provision from 6 000L as recommended by national policy. Dugard (2009:191) concluded that the *Mazibuko* water rights case presented local governments with a unique opportunity to implement a progressive rights-based equitable approach to water service delivery that encouraged social good and public participation. This approach took local contexts into consideration, tailoring existing policy provisions to best serve the communities; driven purely by the prioritization of ensuring a safe, sustainable and continuous supply of water to all, regardless of location and socio-economic status.

3.7 Water Inequality in Cape Town

When water inequality is measured, it is across obviously contrasting types of settings that have already been compared, where researchers tends to compare the township[2] to the suburbs, negating the complex inequalities that exist between the formalised section of the township and the informal settlements within the same township. This research posits itself on the intersections of geographic and spatial inequality to highlight this, and to argue that we need to redirect our focus towards the nuances that make the informal settlements a difficult place to implement effective water management systems. This research begins the debunking of informal settlements as a monolith riddled with lack and dysfunction by exposing the spatial and class disparities that afford some residents better access to safe drinking water, while others do not enjoy the same privilege, despite being practical neighbours. This brings into question the lack of commitment from local governments to provide a steady supply of clean drinking water to people who live in informal settlements, by exposing the disparities that exist in water provision services within peri-urban spaces.

Lack of service delivery, particularly in South Africa's townships is largely due to "logistics, cost and affordability, and national policy being to upgrade or replace informal settlements with formal settlements, which is a slow process" (Cole *et al.*, 2018:44). Cole *et al.* (2018) argued that rapid population growth which has increased the number of households reliant on the municipal water supply grids and internal migration (inter-provincial and rural-to-urban) are some of the other challenges to achieving universal service delivery, particularly water

[2] Residential spaces formerly officially designated for black South Africans by apartheid legislature.

delivery. The dimensions of inequality discussed in this section express themselves in the City of Cape Town as well, and while each city is different, post-apartheid cities are founded on the same fundamental principles of urban planning. Spatial inequality excludes people living in informal settlements from participating in forming part of the city's plans, and service delivery reflects this. Of the 70.1% of the water that the city allocates to residential areas, approximately 5.1% goes to the informal settlements which make up more than 80% of the city's households (CoCT, 2018).

While the City of Cape Town built and owns three of the "big six" dams in the WCWSS, the national DWS has full ownership and regulatory control over all dams. As a designated water service provider, the City of Cape Town treats and distributes water received from WCWSS and is required by national legislation to oversee water management. This separation of roles and responsibilities was blurred with the 2015 drought, as the city tasked itself with the responsibility of solving the crisis of mismanagement in a time of prolonged dry periods, despite not having legal ownership over any of the water in the city. The water restrictions, increased tariffs and penalties were all decided on by the city. To match this, the DWS enforced restrictions in the agricultural sector in 2018 (Enqvist & Ziervogel, 2019). Heavy campaigning warning of *Day Zero* and the effects it would have on people's lifestyles was preliminarily cited as the reason for the decline in water consumption, and not the strong official recommendations to save water (Enqvist & Ziervogel, 2019).

This blurring of roles in urban water governance means that municipalities are not held accountable for failing to supply water to all equitably because ultimately, it is the national governments' responsibility to purchase enough water and this is still a challenge for South Africa.

Enqvist and Ziervogel (2019) suggested that urban South Africa adopts a supply-driven approach to water provision where the state (through local and national bodies) is responsible for all water provisions and management. As such, collective action is not expressed through mobilisation to build and maintain communal water systems but through protest action when the residents feel failed by the government. In Cape Town, residents of Khayelitsha have been protesting for water services for more than a decade, yet in 2017 about 10% still had no access to either running water or sanitation facilities (Enqvist & Ziervogel, 2019). In an effort to address inequality in access to water, the DWA proposed the Free Basic Water Policy to the government and the policy was passed in 2001. However, in 2007 and 2014 DWA revised the

policy because municipalities lacked the capacity to implement it. The DWA then introduced block tariffs to fund poor communities' water needs. However, failure to consider the social dynamics that make up many South African black homes ended up costing these communities more for water (Enqvist & Ziervogel, 2019).

To correct the effects of a poorly implemented water policy, another programme was initiated to install water management devices in low-income areas, and the ignorance about household arrangements triggered the restrictions on the water management devices when a household "overused" water, despite the fact that the water management devices operate on the naïve pre-set assumption that each household has no more than four inhabitants (Enqvist & Ziervogel, 2019). Enqvist and Ziervogel (2019) concluded their discussion on justice and water inequality by problematizing the ways in which residents in low-income areas were made to sign the forms accepting the installing of water management devices without understanding the consequences and the restrictions that would clearly not work in black households. They also noted how the installations of water management devices targeted high-income households only when the water crisis became severe. Lastly, the poor quality of water infrastructure characterised by frequent leakage meant that the water management devices would register the violation of restrictions, risking punishment.

This study is important because it places water governance in the City of Cape Town in the context of the water crisis, highlighting the layers of inequality caused by water scarcity. The multifaceted nature of water necessitates water governance, and depending on the role of this governance, there may be conflict between addressing injustice and increasing efficiency or cost recovery. Drawing from the Cape Town experience, Enqvist and Ziervogel (2019) explored what happens when institutions put in place for the provision of water services have failed to adapt to structural and natural changes and this will always be worthy of investigation, as long as South Africa continues to use unrefined apartheid infrastructure to deliver water services through a supply-driven approach.

Rodina (2016) investigated the lived experience and material dimensions of water access in Khayelitsha to demonstrate how these approaches to studying people's experiences with water are powerful analytical tools for a context-specific understanding of water inequality, which can be instrumental in informing policy around the human right to water. This study takes place in the context of post-apartheid South Africa and adds to the literature on the growing discourse around redressing past injustices and inequalities to improve the quality of the lives of the

marginalized people who live in urban areas. Rodina (2016) began by outlining the ways in which South Africa has progressed towards equitable access to water for all, by citing the Free Basic Water Policy as a means to ensure that citizens receive sufficient water, and the Constitution (1996) which guarantees water as a basic human right. Rodina (2016) further cited social movements, resident-led protests and court processes, as some of the ways through which this progressive democratic legislation is challenged to redefine the implementation of the right to water. Referring to the 2011 census published by the City of Cape Town (2012), Rodina (2016:58) stated that the City of Cape Town had made progress in delivering clean safe drinking water within 200 meters of over 96.6% of the households in the city; however, stressing that “these numbers look very different in many informal and peri-urban townships”.

Rodina’s (2016) observations attest to the efficacy of social movements and protest action as drivers of dialogues, in some instances being the force behind significant change. Protests specifically draw attention to poor service delivery and makes the problem difficult for governments to ignore. However, social movements are derailed when it becomes clear that multiple struggles are at play. Communities mobilize around the common need for water, but the level of access the individual people require differs considerably and is pre-determined by the politics of identity. The discourse on access to water in social activist spaces is driven largely by women, and this was evident in this study as the narratives explored were predominantly those of the women of Khayelitsha. This suggests that the realities of people living in impoverished areas are too different to fall under one movement and no social movement has been able to capture the people’s struggle fully because their overlapping struggles are perceived as competing.

In this study conducted in Khayelitsha Site C, Rodina (2016) argued for a more critical exploration of the processes that led to policies around water provision and the practicality of these policies, measured against the right to water. Centring lived experience and the material conditions of water access in research offers insights on the practical implementation of the policy and allows us to interrogate the “on the ground realisation” of the right to water (Rodina, 2016:65). According to Rodina (2016), understanding the experiential and material dimensions of different levels of access to water helps policymakers to assess the uneven distribution of water services in Khayelitsha, and this is crucial to the reconfiguration of inclusive and equitable policies; matched by consistent implementation on the ground. This approach to studying water inequality revealed the impact of uneven implementation of access to water on

the material and symbolic aspects of human life in Khayelitsha and provided the first point to consider in how the right to water can be actualized. Rodina (2016) emphasized that these interventions informed by experiential focus on access to the right to water revealed inequalities that would have otherwise been overlooked if only service coverage statistics and water policies had been considered.

Rodina (2016) was significant to this study because treating access to water as a human right compels the stakeholders in the water sector to honour the obligation to provide safe and affordable water to all, as mandated by the Constitution (1996), irrespective of one's ability to pay. This sentiment is echoed by this study, which also looks to lived experience because the reports by various components of the water sector at the national and municipal level report progress on water provisions that is not corroborated by the experiences of the residents on the ground. The inequality reflects different treatment in respect to different areas of the city and requires targeted investigations considering as many different areas as possible, for us to draw comparisons between access to the right to water in the various areas to be able to put this inequality in the context of global experiences of water inequality. Cameron and Katzschner (2017) presented how integrated urban water management is stagnated by the lack of physical changes to the city, thus hindering the ability of natural water sources to replenish themselves as freshwater systems in the urban space degrade. They argued that improving water literacy in urban planning can, through ecological alignment, restore water systems.

If this is achieved, a water secure future lies ahead for the City of Cape Town. Their research proposed a theoretical spatial water framework (SWF) that would embrace and encourage restraint towards water use and storage. Moreover, it supported the argument that the inequalities in accessing safe and clean drinking water are the same inequalities that ensured that floods and droughts affected various areas of the city differently, with the impacts being more severe in low-lying areas, which also happen to be where the poorest residents live (Cameron & Katzschner, 2017).

3.7.1 The Cape Town water crisis

Water management experts began raising concerns over the decline in rainfall in their 2014/15 annual report. This decline, coupled with a rapid reduction in dam levels all over the Western Cape Province was enough to encourage provincial government to introduce strict restrictions over water consumption, starting with Level 2 restrictions in January 2016 and Level 3B a year

later (Muller, 2017). Under Level 3B restrictions, residents were expected to use between 70 and 105 litres of water per person per day and large consumers were targeted with punitive measures such as the installation of water restriction devices and heavy fines if they failed to reduce their consumption by 20% (CoCT, 2017). To cope with the 2015 water crisis, the City of Cape Town began curtailing water usage and supply, and these changes were accelerated in 2017 with Level 5 water restrictions. Under Level 5 restrictions, residents across the city were expected to use no more than 75L of water per person per day, and non-essential use of municipal drinking water was prohibited. Less than a year later, the city approved Level 6B restrictions which encouraged residents to cut down from 75 to 50L per person per day. Along with this were punitive tariffs for consumers who did not comply.

Ouweneel *et al.'s* (2020) study analysed how different residential areas in Cape Town responded to water restrictions and tariffs during the water crisis and explored the potential implications for tariff adjustments and other ways to ensure sustained access to adequate water, at an appropriate cost for poor households. Their study conducted across three different socio-economic realities and highlighted how the tariffs were not implemented equitably, with the burden of water conservation during the crisis resting on the urban poor, who were observed to have significantly reduced their demand for water, even after the crisis had eased (Ouweneel *et al.,* 2020). The study illustrated how the socio-economic divisions that exist in the City of Cape Town need to be taken into account when the differences in water demand and the public's response to water-saving campaigns by the city are discussed, by showing the role played by water management and public response in averting Day Zero.

The study found that lower income areas reduced their water demand by 32%, middle-income suburbs by 59% and higher-income suburbs by 58% (Ouweneel *et al.,* 2020:129). Furthermore, middle-income and higher-income areas responded to water restrictions immediately, while the lower income areas were found to be slower in response. However, Ouweneel *et al.* (2020) asserted that this was because water restriction Levels 1 to 5 were targeted at outdoor uses of water such as swimming pools and irrigation systems. Ouweneel *et al.* (2020) noted that a significant decrease in water use in lower income areas was observed with the implementation of restrictions Level 5 and Level 6B. Ouweneel, *et al.* (2020) found that middle-income to higher-income households tended to resume high water usage faster once the water restrictions had been phased out. This may be because these households could afford the higher tariffs that accompanied restrictions. Ouweneel *et al.* (2020) concluded that the water restrictions and

tariffs implemented during the water crisis altered the usage patterns and behaviour of all users, regardless of socio-economic status and state, citing March, Domènech and Saurí (2013), who stated that that behaviour was likely to last past the easing of the drought. Borrowing from Enqvist and Ziervogel's (2019) language, "water conservation, like droughts, was the 'new normal' for the residents of Cape Town". As such, Ouweneel *et al.* (2020) suggested that water management strategies needed to be more equitable and cognizant of poor households' ability to sustain increased tariffs, especially outside of drought conditions.

At a satellite World Water Forum event held on 20 March 2018 by the South African Institute of International Affairs and the International Water Association at the University of Cape Town, Cape Town Councillor, Xanthea Limberg presided over a discussion by various stakeholders on what a water-sensitive city would look like: in response to the water crisis. Addressing the participants, Limberg presented a potential water resilience programme, including three additional possible sources of water to supplement existing sources. These were plans towards desalination, tapping into the Table Mountain aquifer and the Cape Flats aquifer, and considerations being made about making wastewater available for drinking purposes through reticulation. Gatherings of this kind were held across the province to consolidate efforts and expertise from various stakeholders. Notable, however, was the fact that the residents who were invited to participate were limited to those on the city's network of customers. This process limited participants to those expressing suburban experiences and formalized settlements in the Cape Flats but disregarded the needs and contributions of the residents who lived in the informal settlements.

Despite stringent water restrictions and punitive measures in place to encourage adherence, the water situation worsened and by August 2017, overall dam levels were at 28% (CoCT, 2017). With just over 100 days of water left, the City of Cape Town began the countdown to the infamous *Day Zero*. Muller (2017) broke away from the chronological observation of the situation and challenged the passive attitude many residents had towards water shortages. While he agreed that the city's water sources have always been stressed due to the periodic dry spells and very small catchment areas, he argued that low rainfall was neither the main nor the only cause of the water crisis. Muller (2017) cited increased water consumption as one of the important factors leading to the water crisis.

Muller (2017) quoted the Department of Water Affairs' 2007 Western Cape Water Supply System Reconciliation Strategy which predicted that the city would need to redefine adaptation

strategies in 2015, should the region be hit by a drought (Muller, 2017:11). With an above-average rainy season until 2013, Muller (2017) asserted that city policymakers saw no reason for the city to begin taking steps towards securing alternative sources of water, despite having substantial options. This was, according to Muller (2017:16) a “fatal mistake” as the city conducted a feasibility study in 2014 of the possible sources of water but it was based on the miscalculated assumption that no new water would be needed until 2019, or even 2024.

By the end of 2015, a decision was taken to explore alternative sources as the water situation was getting worse and this resulted in restrictions on consumers in the 2015/16 period. However, the agricultural sector was exempt and there was over-allocation to agriculture, as the rainfall level was too low as the summer season had already started. Taking all of that into account, Muller (2017) maintained that it was the increase in consumption that accelerated the Cape’s water challenges towards crisis level.

Wolski (2018) overlooked the debate surrounding the labelling of the water situation as a crisis or not, and offered a statistical analysis that deduced the severity of the drought. Wolski (2018) performed an in-depth reading of data obtained from South African Weather Services' weather stations used to measure rainfall near WCWSS dams, going as far back as the late 1800s. According to Wolski’s calculations, 2017 was “the lowest rainfall year since 1933” (Wolski, 2018:26).

Both Muller (2017) and Wolski (2018) provided a historic analysis of rainfall in the Western Cape, which was focused on Cape Town. However, Muller (2017) performed a more policy-based analysis, looking towards the Department of Water Affairs’ Western Cape Water Supply System Reconciliation Strategy, created in 2007, to trace the point where the City of Cape Town policymakers made what he called a “fatal mistake”. Wolski (2018) looked at the same document, but focused more on the technical findings; tracing rainfall as far back as the 1800s, to observe drought patterns; but explicitly refraining from offering any reasons for the crisis. The main take-away from these papers for this research was the availability of substantial data from the WCWSS that showed that the city’s policymakers were aware of the drought a considerable number of years before the first signs of shortage; which raises the question; why were there no urgent steps taken given that the city was potentially in a position to avert the water crisis, or plan better adaptation strategies before the situation worsened?

If we accept Muller's (2017) assertion that the biggest contributing factor to the water crisis was consumption, then it is clear that the residents in informal settlements were not the most excessive consumers. As such, they should not have been placed under restrictions. Moreover, the city had always been transparent about the fact that less than 4% of its water went to households in informal settlements, while about 67% went to suburban households (CoCT, 2018). The unjust distribution of responsibility in water conservation is an indication of water inequality that highlights the generalised approach with which the City of Cape Town approaches water service delivery. Although it is clear that informal settlements do not access water, and therefore do not experience water crises, in the same way as middle- to high-income areas, they are still subject to the same rates and restrictions as areas that typically overuse water.

3.7.2 Factors that sustain water inequality in South Africa

The democratic government of South Africa inherited its infrastructure from the apartheid government. Like the current government, the apartheid government was not equipped to cope with severe water-related disasters or water crises because all the infrastructures were designed to service a white minority population, concentrated primarily in the cities. Despite being the first country in the world to enshrine the right to water as a basic human right, South Africa has still failed to meet the SDG 6.1 because of what Piper (2014) terms as "South Africa's water apartheid". By the end of apartheid in 1994, 70% of the population had access to only 11% of the country's water and this was expected to have been remedied by the RDP[3] which promised water security for all (Piper, 2014). However, this was not realised and consequently, a series of periodic nation-wide protests for service delivery began. Political analysists cited the monumental lifting of sanctions in 1991 as the beginning of the deterioration in President Nelson Mandela's resolution to provide water for all. The lifting of sanctions meant a re-entry into international trade for South Africa and, following IMF conditionalities, the country began to implement neoliberal economic policies and the government, utilizing outdated colonial/apartheid infrastructures and systems could not keep up and the backlog that exists until today began (Piper, 2014).

[3] Reconstruction and Development Programme was a socio-economic policy framework implemented by the newly democratic South African government in 1994 to address socio-economic problems created by the apartheid government. The main goals were to alleviate poverty and address the massive shortfalls in social services across the country.

Natural disasters related to water not only destroy the physical homes, livelihoods, and social arrangements of poor South Africans, but the recovery therefrom requires large sums of money and the funds often come from international governing bodies or allies that attach conditions to the 'aid', or private donors who have political motives that ultimately cause even more harm. Degradation of the natural environment and increasing populations mean that future droughts and floods will only get worse, as the infrastructure cannot withstand the pressure, and people will demand more funds for adaptation, thus sustaining inequality as the cycle continues.

3.8 Conclusion

Water inequality and water scarcity converge at the complex intersection of accessibility and availability. The literature illustrates how water inequality is an undeniable outcome of scarcity, but it also shows how inequality can lead to scarcity for impoverished communities. Chitonge (2020) highlighted the orders of scarcity to contextualise the environmental, anthropogenic, and institutional factors that lead to scarcity, while Cole *et al.* (2018), and Sutherland *et al.* (2014) looked at the built environment as a cause of water inequality by dissecting the role played by apartheid infrastructure in discriminatory water service delivery. Zerah (2000), and Howard and Bartram (2003) unpacked inequality in water consumption to illustrate that the inability of lower income areas to store large volumes at a time fosters inequality in how much water they consume, compared to their middle-higher income counterparts. Ziervogel (2017), Muller (2017), Maphela and Cloete (2019), as well as Dugard (2009) looked to official documents and reports, including court proceedings and the Constitution (1996) to discuss water inequality as a result of poor water governance that disproportionately affects informal settlements in South Africa. Thus, this literature review delved into the global arguments that water inequality is not exclusively an issue of water scarcity, but of disproportionate allocation of the available water resources. Finally, this chapter identified a gap in local studies on water inequality in informal settlements.

Chapter 4: Methodology and Study Site

4.1 Introduction

The purpose of this chapter is to describe the research process followed in this study. It outlines and provides justification for the methodological approach used. The chapter describes the various stages of the research, including the selection of participants, the data collection process, and the process of data analysis. The chapter then positions the researcher in qualitative research to establish reflexivity. Finally, the chapter concludes with a discussion of validity and reliability in qualitative research and discusses ways in which these two requirements were met in the study.

A qualitative research approach was chosen as the methodology because it reinforces an understanding and interpretation of meaning as well as the intentions underlying human interactions. Data was collected using in-depth interviews and the researcher's observations of the study. The approaches and the methods used in this study were selected after careful consideration of the aim of the whole study and what the results would mean for the various people who would be involved in the study. Qualitative research allowed for concurrent application of both discourse and narrative analyses; namely, the work of deriving meaning from people's circumstances and experiences. The next paragraphs provide detailed justification for selecting the specific approaches and methods used.

4.2 Research Questions and Objectives

According to Denzin, Lincoln and Smith (2008) a research methodology or strategy is determined by the nature of the research question and the subject being investigated. The research format used in an investigation should be seen as a tool to answer the research question(s).

This study aimed to explore and understand the meanings of the data obtained from the participants as they described their own experiences of water inequality. The study investigated the participants way of looking at and deriving the meaning of water inequality in the township of Khayelitsha, without attempting to alter the experiences of the participants as they spoke on behalf of all township communities. The study was guided by the main question "how does the City of Cape Town's response to the water crisis further perpetuate water inequality in the impoverished communities of Khayelitsha?" The supporting questions spoke to the categories

of inequality that affected the residents' access to a clean water supply, and the dimensions of inequality such as geographical location that influenced the quality of water services such as water infrastructure maintenance.

The main objective of this research was to highlight the disparities in water delivery caused by the people's geographical locations in the informal settlement because the prevailing theoretical assumptions and proposed solutions to water scarcity did not fully appreciate the layered experience of informal settlements with regard to water inequality. This study positions itself on the intersections of geographic inequality and water inequality and aims to weave narratives out of the complex social dynamics that sustain the unequal access to water between the recognized and unrecognized settlements of Khayelitsha.

Furthermore, it seeks to start a conversation that can lead to a shift in attitudes and perceptions of water access in informal settlements that will facilitate the establishment and the adoption of alternative policies concerning water distribution, in order to benefit all the people living in the city, regardless of their location and social/economic status.

4.2.1 Appropriateness of the research design

A qualitative study is appropriate when the goal of research is to explain a phenomenon by relying on the perception of a person's experience in a given situation.

This method of research was useful because it allowed the researcher to analyse not only water usage, but also the physical arrangements and the location of the nearest freshwater source in the areas investigated. This is an integral part of the research following the argument that spatial inequality maintains systems showing a lack of infrastructure and oppression in the distribution of water in Khayelitsha. From these interactions the researcher expected to be able to deduce how much water each household received on average and the implications for each home under water restrictions. Personal narratives were also very important for this research as they informed people's perceptions on water and highlighted the misuse of knowledge as an instrument of inequality.

4.2.2 Research design

Firstly, an extensive analysis of the City of Cape Town's archives on water and waste management policies was analysed to deduce how the City's water is distributed, and what the

criteria were for the provision of water per area; both during crisis times and periods of peak water supply. This data was mainly sourced from literature by experts who studied the City of Cape Town's infrastructure and built environment, as well as dam records. The technical data was sourced from the city's database on water service delivery in the informal settlements. The researcher engaged in participatory action research, observing the attitudes and the perceptions people have towards water in an identified household in Litha Park, Khayelitsha. This initial interaction informed the researcher on which specific areas to focus on, and the participants were then selected.

4.3 Setting and Participants: Case Study Area Background

4.3.1 Setting

In qualitative research, the setting is the physical, social or cultural site where the study is conducted in with the main objective of deriving meaning (Denzin *et al.*, 2008). Khayelitsha is one of the biggest informal settlements in South Africa, created by the apartheid state in 1983 as a low-cost housing development project for black working-class South Africans who served predominantly as a domestic labour pool for white city dwellers (Seekings *et al.*, 1990). Turok (2001) classified Khayelitsha as being characterised by hazardous environmental conditions because of its location in the Cape Flats. Geologically, the Cape Flats refers to a low-lying area in the south-eastern area of the Cape Town Metropolitan area, characterized by aeolian sand from the adjacent beaches, and the underlying Malmesbury shale bedrock which means that the sand is unconsolidated and has a nutrient-deficit. The area is prone to both droughts and flooding because the sand cannot retain water. The City of Cape Town uses guidelines which refer to areas of informality to describe various types of settlements and these include, but are not limited to, townships and backyard settlements. On the city's geographic information system (GIS) there are pockets of areas classified as informal and the technical definition of an informal settlement is an unplanned settlement that has developed over a period of time, on land that is either owned by the city or on privately owned land, without any authorization or planning approval. Inhabitants are characterized by having:

(a) Insecure residential status.
(b) Inadequate access to safe water.
(c) Inadequate access to sanitation and other basic and engineering structural services, poor housing, pollution, overcrowding and irregular and unplanned housing not in compliance with current housing regulations.

Khayelitsha comprises both formal and informal settlements and Litha Park falls under the formalized section, while Endlovini is an unrecognized informal settlement characterized by unauthorized housing. Informal settlements are always growing, as more and more people move to certain parts of the city. Therefore, even in Endlovini, there are newer sections where people have settled in the last five years.

4.3.2 Profile of study area: Litha Park and Endlovini

Litha Park is a formal settlement of Khayelitsha consisting predominantly of bank bonded houses and is home to the middle class of Khayelitsha. Litha Park was built around the older settlements in the original formal areas. Litha Park is supplied water exclusively by the City of Cape Town using several billing systems where water management devices (WMD) are used to regulate how much water each household uses, how much they pay, and when and how they pay for the water. Each household has indoor taps in the kitchens and bathrooms, as well as a tap outside and a functional sewage system. The participants chosen from Litha Park were predominantly female, even in households that had men, because the allocation of water in the households is their responsibility. The participants were older because the settlement itself is fairly old.

Endlovini is an informal settlement of Khayelitsha and is relatively young, with the first inhabitants having moved there in 1997, many coming from neighbouring settlements that have been saturated. Endlovini was built across the main road from Litha Park, and the people live in shacks made of whatever material is available. Endlovini is supplied water by the City of Cape Town through street taps, although there were no water services when the settlement was first built. Initially, the residents of Endlovini had to go to the burial grounds in Tafelsig to fetch water and those who knew people in Litha Park could go and ask to fetch water there. The taps and communal toilets were installed in the early 2000s and some residents had the means to draw water from the street taps and pipe it directly into their homes. The participants in Endlovini were only female because usually, the responsibility of allocating water in the households lies with them. The physical arrangements of Litha Park and Endlovini varied significantly and highlighted the various accessibilities to water. The footpaths within the settlement of Endlovini are mostly inaccessible by car, and there is very little room in between the homes to transport large containers of water from the taps closer to households for easy access. The first of these homes, predominantly shacks and mud houses, were arranged as close to Mew Way, as possible for easy access to the main taxi route, but as more people settled in

the area, the settlement grew further inwards. The initial communal taps are located at the back of the original homes, adjacent to Steve Biko Road. Many of the taps are installed in what seems like a random order within the settlement, but this is not the case. It attests more to the rapid growth of the settlement. The oldest street standpipes were installed around the first ever homes directly below Mew Way.

There were fewer people in the streets of the neighbourhoods of Litha Park, and the more affluent the area, the less people there are outside the houses. There is no strong sense of community and cohesion. People keep to themselves and this made it incredibly difficult to find participants, as many people were not close enough with their neighbours to reach out to them. The streets are very clean, and the drains are clearly functional, with neat paving separating the roads from people's driveways. Only one participant in Litha Park knew a neighbour who was having problems with water, but all the participants knew at least one person in an informal settlement who had been complaining about water. Streams of litter fill the streets and footpaths of Endlovini, and all the participants assume that their experiences with water are the same because they do not openly discuss their water problems, because there is no point. The residents also know that they are not welcome in Litha Park and are reluctant to ask for water from their neighbours in Litha Park when their supply is cut off because they are constantly reminded that they do not pay for water and thus have no right to demand that the city should provide them with water.

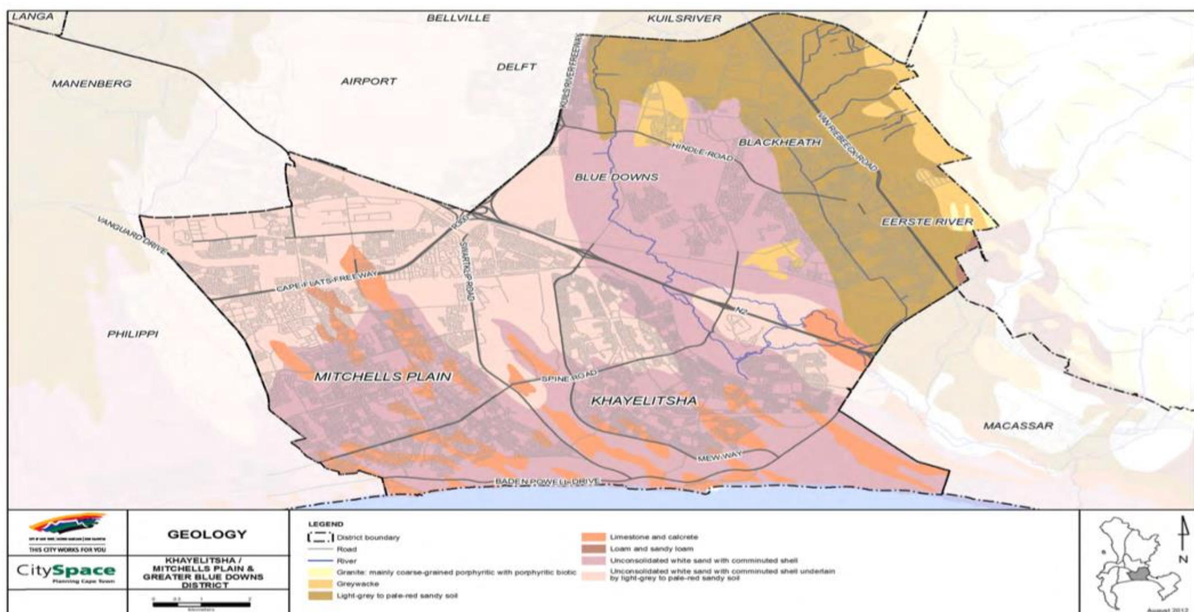

Figure C: Geological map of Khayelitsha (CoCT, 2005).

It is difficult to keep track of the exact numbers of informal settlements and the households within each settlement, due to the sporadic influx of people into the city, which means that the

settlements are constantly growing and branching off into newer settlements. Khayelitsha is divided into about 22 areas consisting of formal recognized settlements and informal unrecognized settlements. The initial settlements were built by the apartheid government and are all formal and numbered as sections from A-J, while the newer settlements comprise both formal and informal settlements. All the new settlements, with the exception of Litha Park, are predominantly informal. As a result, the majority of the residents do not have access to quality water services because they are classified as illegal dwellers by the city.

Figure D: Census 2011 Suburb Profile: Khayelitsha (CoCT, 2013)

4.3.3 Participants

<table>
<tr><th>Participant No.</th><th>Area</th><th>Size of Household (people)</th></tr>
<tr><td>1</td><td>Litha Park</td><td>6</td></tr>
<tr><td>2</td><td>Litha Park</td><td>4</td></tr>
<tr><td>3</td><td>Litha Park</td><td>5</td></tr>
<tr><td>4</td><td>Litha Park</td><td>4</td></tr>
<tr><td>5</td><td>Litha Park</td><td>4</td></tr>
<tr><td>6</td><td>Litha Park</td><td>6</td></tr>
<tr><td>7</td><td>Litha Park</td><td>5</td></tr>
<tr><td>8</td><td>Endlovini</td><td>5</td></tr>
<tr><td>9</td><td>Endlovini</td><td>4</td></tr>
<tr><td>10</td><td>Endlovini</td><td>5</td></tr>
<tr><th colspan="3">Water and Sanitation Department (WSD)</th></tr>
<tr><td>Capacity</td><td colspan="2">Division</td></tr>
<tr><td>Operations & Maintenance manager</td><td colspan="2">IS Basic Services (WSD)</td></tr>
<tr><td>Head engineer</td><td colspan="2">Informal Settlements (IS)</td></tr>
<tr><td>Head of operations</td><td colspan="2">Formal Settlements</td></tr>
</table>

Table a: List of Participants Consulted by the Researcher during Fieldwork

Without creating an "Other", the researcher conducted the research in the participants' homes. While there was a clear separation of roles, this did not translate into a concentration of knowledge and power. The researcher clearly understood and remained critically aware of the fact that she was not the knowledge keeper or the knower and was also a participant in the research, by merely asking questions. There were 10 overall participants interviewed between June and August of 2019, each the head of a household of no less than four people.

The majority of the participants were older women who have homes in Litha Park, and they introduced the researcher to the women in Endlovini. In Litha Park, a participant was chosen in each of the main sections and their homes were significantly far apart to get as wide and yet close observation of the reality as possible. In Endlovini, however, this was not the case, as the participants who were introduced to the researcher all live in the same area. One of the reasons for the proximity of the participants is the arrangement whereby they acquired their plots, and to enable them to also share tap and ablution facilities. The details of sampling are discussed under the *instrumentation* section below.

Having interviewed the residents of Litha Park and Endlovini, the researcher reached out to the City of Cape Town's Water and Sanitation Department (WSD) for operational data and maintenance records. It was also evident that there was a need for a definitive, technical description generated by the city, of what constitutes a formal and an informal settlement. It was also crucial to have access to the city's employees to find out what their perceptions were of service delivery in Litha Park and Endlovini. This was especially important because the study relies on the argument that the city's employees are aware of the various inequalities between Litha Park and Endlovini, and hence the differences in the way they respond to water-related complaints and maintenance in both communities.

The interviews with the employees of the City of Cape Town's WSD took place at their head offices in Belville in December 2019. Two of the participants were employed in the informal settlements' division of the department under which Endlovini falls, and the third participant was an employee responsible for water and sanitation services in the formalized sections of Khayelitsha, under which Litha Park falls. From the informal settlements' division, one employee was in charge of technical operations including, but not limited to, the installation, maintenance and repairing of hardware, such as taps, and sewage outlets and the other employee was in charge of remote operations and for overseeing the overall contact between the department and the community. The employee from the formalized sections was in charge

of all operations, including overseeing the reporting tools, to ensure that all the workers across the different divisions of the department were always up to date on which areas required maintenance. As was the case with the first group of participants, there was an emphasis of the fact that the researcher was not the knower. In fact, the participants themselves were regarded as the experts.

4.3.4 Instrumentation

Initially, the research used purposive sampling to recruit the first participant, *uMakhulu*[4], with the idea that an older woman would be suitable for the study, based on the researcher's pre-existing knowledge of household dynamics in Litha Park. Older women are primarily the ones who acquire and/or allocate resources in the home, especially water. Having established the initial relations in the community through *uMakhulu* and her granddaughter, snowball sampling was then used to recruit the rest of the participants who live in Litha Park.

In instances where the women were at work during the researcher's visits, most of the men did not feel they would be helpful and stated that their wives were the ones who "knew water stuff". However, the researcher came across two single-father homes where men were in control of the allocation of water and this added some nuance to the research as they offered a different experience.

Once the first five participants in Litha Park had been interviewed, the researcher was directed to an older woman in Endlovini who was known as the first resident of Litha Park and the chain then continued into Endlovini.

The majority of the homeowners in Endlovini are younger people ranging between the ages of 20 and 38. The first participant was an older woman in her late 60s like *uMakhulu*, but the other two participants were women between the ages of 33 and 38. Building a new settlement is an intensely laborious task and, without resources and the luxury of time, it becomes even more strenuous, hence the majority of the people in Endlovini are young. A similar trend of men expressing a self-imposed inadequacy in discussing issues related to water was picked up; as the men in the homes the researcher visited immediately delegated their female partners to be interviewed, once again because they were the ones who "knew water stuff". Unlike in Litha Park, the researcher did not expect only women as participants because there was no prior

[4] Direct translation: grandmother in the isiXhosa language, but used by everyone in the community to respectfully refer to older women.

knowledge of home dynamics in relation to the allocation of resources, and because informal settlements are unconventional societies, there was no expectation of conventional gender roles.

The inclusion of Endlovini in the study provides a comparative basis because inequality is relative. It is important to explain the difference in access to water for residents who live in the formalized sections of Khayelitsha compared with those who have not been recognized as formal residents. This intra-community comparison is driven by the participants' perception of their own experiences compared to their neighbours' and this is part of what the study attempts to contextualize. This approach is useful for the study because the inequality is more pronounced in this setting than between any of the affluent areas in the city because the City of Cape Town's response to the water crisis further perpetuated the inequalities unique to Khayelitsha because of its geographical location. In research and literature, there is a tendency to treat all of Khayelitsha as a homogenous entity because all the settlements are in the same geographical category, but as this study will illustrate, there are significant differences in the way that city officials interact with each settlement. Thus a highly perceptive account of water inequality within Khayelitsha is required.

4.4 Data Collection

The primary data collection method was interviewing the head of the identified household in a one-on-one setting and these interviews were recorded with consent from the participant, and the officials in the employ of the City of Cape Town's Water and Sanitation Department. The secondary method was analysing the archival material from the municipality in the form of policy documents, reports, and other relevant electronic data, taking notes from informal conversations relating to the water crisis, and making observations of the social interactions and discussions members of the household have regarding general water quality and accessibility. During the observation phase, it was not always possible to take notes without drawing attention to the researcher and taking photographs of objects/street names at important points was subtle enough since many young people are always using their cell phones. These photographs served as cues for certain conversations/important information that the researcher found profound enough to want to remember. The researcher also took specific photographs of the taps for analysis. All the data collected, including transcriptions thereof was stored safely on multiple media for easy access as the researcher proceeded with the research goals.

4.4.1 Data processing and analysis

The recorded one-on-one interviews and conversations were transcribed, and the fieldnotes consolidated to supplement and corroborate the data collected from interviews. The interviews were grouped by keywords and a thematic analysis was conducted to flash out the apparent themes and make meaning of them. A deductive approach to qualitative data analysis was also used to perform a narrative analysis to reconcile official documents from the city with the lived experiences of the participant. The data extracts and analytical narratives were woven together according to the themes and then contextualized in relation to the literature.

4.4.2 Ethical considerations

The study was guided by the University of Cape Town's code of conduct for research, as approved by both the Faculty of Humanities and the Centre for African Studies. The researcher introduced herself to every participant and fully explained the main purpose of the study and their role in the research. The participants were asked first if they agreed to be interviewed, and upon their verbally agreeing the researcher asked them to sign a consent sheet. Before conducting the interviews, the researcher very clearly and verbally asked for the explicit written (by way of signing the consent sheet provided by the department) permission of the participant, both to ask them questions and to record their responses. The researcher made it clear that their responses would be anonymous and would be treated with the strictest confidentiality. The participants were also notified of their right to retract all/any information and/or overall willingness to partake in the study at any point, and this was very clearly reiterated. The study did not include interviews with persons under the age of 18 years, but parental consent remained open if any of the informal conversations included minors, which they did not. The researcher took photographs of the general environment in a way that ensured that the identities of all the participants and their homes would not be divulged.

There were no issues in breach of ethical conduct at any of the stages of the research. However, the researcher did seek council with the supervisor when there were ethical concerns, to ensure that the researcher acted and reacted in a way that not only protected the participants, but also maintained the integrity of the research. The researcher also referred to the University's guideline on ethical research at every new stage of the project so as to remain within the stipulated ethical boundaries.

4.4.3 The researcher

In qualitative research the researcher plays a fundamental role as an instrument of data collection and interpretation (Creswell, 1994). Qualitative research is an interactive process undertaken by subjective individuals, hence interviews can never be neutral. Guided by the feminist ideal of 'personal is political', the researcher acknowledged this subjectivity and exploited her own experiences with water inequality to design the interview questions and their format.

The researcher remained cognizant of her own biases and narrative in conducting research on the matter as water access is regarded as highly personal and this played a huge role in the analysis of the data and the participants' experiences. Creswell (1994) posited that when a researcher acknowledges this subjectivity, they are able to account for what has led them to investigate the subject.

The researcher is a black woman who was raised in QwaQwa, a former Bantustan in the eastern Free State, created by the apartheid government to contain Sesotho-speaking South Africans. QwaQwa is in a semi-arid area and is prone to droughts. The small town is closely surrounded by mountains and thus enjoys an abundance of natural freshwater sources. However, the biggest dams in the area feed the City of Johannesburg in the Gauteng Province, supplementing the Lesotho Highlands Water Project. Given this background it was easy for the researcher to resonate with and understand the different constructions being presented by the participants, both as a result of having been born into a displaced community which remains disenfranchised by apartheid infrastructure, and due to having experienced multiple water crises in the Free State, with the longest resulting in three years of no tap water in the village the researcher lived in between 2015 and 2018.

The researcher's deep resonance with the complex situation the people of Khayelitsha, particularly Endlovini, find themselves in guaranteed a sensitivity concerning the holding of space, as the participants recounted their experiences of the water crisis. Consideration and care went into establishing trust between the researcher and the participants, and the researcher drew on her personal experiences of living under crisis conditions in QwaQwa, to ensure that human intuition and experiences trumped pedagogic training; which tends to treat participants as subjects and creates a hierarchy of expertise, placing the researcher at the top as the authority and knower. This research was birthed out of the researcher's own experiences of water

inequality, and this informed the key research question. In choosing the participants, the researcher tapped into the relations that had been exposed to upon moving to the City of Cape Town and this automatically determined that the research study area would be Litha Park.

While in conversation with acquaintances in Litha Park about the water crisis, the researcher came to know of Endlovini and the water problems the residents were facing there, and this significantly changed the scope of the research. Through snowball sampling, the researcher was able to recruit participants from Endlovini and begin the fieldwork. Qualitative research is concerned with finding meaning and given the subjectivity of that meaning, the researcher sought to also conduct interviews with employees of the city in the WSD to ensure that the findings were as unbiased and considered many aspects as possible.

4.5 Obstacles

The main obstacle encountered was recruiting the participants, and once the participants had been secured, tracking them was difficult as the majority of them were available when the researcher was not. On two occasions, the researcher met with participants at their places of work because that was more convenient for both parties. Additionally, because the researcher does not live in Khayelitsha, access was a challenge. The researcher had to rely on assistance from a fellow student who lives in Litha Park, and coordinating the times was a big challenge to ensure that the researcher never placed herself in danger by staying in Khayelitsha after dark.

In addition, the second round of fieldwork happened at the Department of Water and Sanitation in Belville and the researcher was not familiar with the area, hence caution went into ensuring that the researcher was not vulnerable to any danger while commuting between the campus and Belville. Much effort went into ensuring the safety of the researcher and participants.

The second obstacle was the language barrier, particularly in Litha Park as the majority of the participants were older women who spoke isiXhosa and very little English. While the researcher fully understands isiXhosa, she found it useful to employ a translator who was a native isiXhosa speaker, and this also allowed the participants to be comfortable and they engaged fully; thus bringing far more to the discussions than they would have done if they were speaking in English. Even though the researcher understood the language when sorting through the interviews later, the translator was still useful in the transcribing of the recorded interviews to ensure that no important information was lost or distorted in translation.

4.5.1 Research limitations

The findings of this study should be evaluated in light of the small sample size and the lack of previous studies on the topic, - as limitations to the study. While this is a focused study, its findings speak for a wider population size than was investigated here. With a population of 4,618,000[5] in 2020, the City of Cape Town is the second most populous city in South Africa and 81% of the population comprises black and coloured people, the majority of whom live on the Cape Flats. The circumstances around the emergence of informal settlements in and around the Cape Flats are unique to each settlement; and while we can make astute generalisations about life in the informal settlements, we can never fully appreciate the narratives unless we interview every single person who lives in every informal settlement.

This study investigated water access and usage in three households in three different sections of Endlovini, and although the participants had been in conversation with their neighbours about water-related problems they had been experiencing collectively, they could not speak for the whole community.

Lastly, there is a plethora of literature on water scarcity in the study area, and on the implications of poverty on water quality. Similarly, many studies have been done on the impact of apartheid urban planning on water and sanitation services in Khayelitsha. However, until the water crisis, these studies were limited to either political or public health perspectives. There is limited literature that examines the links between spatial inequality and how that affects water provisions and causes water inequality. This was a limitation this study had to navigate while filling the knowledge gap.

4.5.2 Validity

The researcher ensured the accuracy of the data collected and correctly cited all information received from all sources. Multiple research methods and approaches were considered and the most favourable one was chosen. All interviews were conducted with transparency and integrity, with follow-up interviews considered where necessary.

[5] Estimated urban population of Cape Town (Population Stat, 2020).

4.6 Conclusion

This chapter described the research process in detail, followed by the completion of the project. It outlined the research methods used to understand water inequality in Litha Park and Endlovini. The study area was briefly profiled to reflect on the historical forces at play that perpetuated some of the challenges the area faces, and the chapter provided justification for the methodological approaches used in this study. The chapter also described the various stages of the research including the selection of participants, the collection and processing of data, the challenges experienced during fieldwork and the ethical considerations that were discussed

The chapter then established reflexivity by explaining the researcher's positionality in the research. It positioned the researcher in qualitative research before concluding with a discussion on validity and reliability and the ways in which these two requirements had been met in the study. Throughout the chapter, an emphasis was placed on the importance of projecting and preserving the participants' narratives and this was the principle that underpinned the selection of the research methods and approaches.

Chapter 5: Dimensions of Water Inequality in Khayelitsha

5.1 Introduction

In this chapter data collected from field work is presented and analysed thematically to contextualize the participants' experiences of water inequality.

5.2 Categories of Inequality

Apartheid spatial planning is a key factor that both propagated and has sustained water inequality over the years in Khayelitsha. This inequality expresses itself in diverse ways and this study identifies three broad categories of inequality. The physical arrangement of the township was designed to fulfil the apartheid agenda of separate development and limit the quality of life for the people designated to these areas. As such, the water delivery infrastructure is not as efficient as in the more affluent parts of the city, although it has been slightly improved in the formally recognized areas such as Litha Park. The infrastructure deteriorates even further in the lower income areas of the township due to lack of maintenance, often with no infrastructure at all in the informal sections. Endlovini is no exception and access to water is irregular, with residents going without running water for days at a time while their neighbours enjoy relatively better services. The informal settlement is a contested space in the South African urban landscape and serves as a living museum of the effects of apartheid on ordinary people whose grievances are not met with the same care and urgency as those of the residents in the neighbouring formal settlements or suburbs. The City of Cape Town's response to water-related issues in Endlovini and other informal settlements reinforces the notion that people living in informal settlements are not as legitimate citizens as their counterparts in formal settlements and this study explores these discrepancies.

5.2.1 Infrastructure

The majority of the respondents in Litha Park reported having more than one tap on their premises. Most of the homes have taps outside and inside the house. All of the water needs are fulfilled using various taps; for example, drinking and cooking water is primarily sourced from the taps inside the house, specifically in the kitchen, while other chores and activities such as cleaning and laundry are reliant on the outdoor taps or bathroom taps, depending on the proximity.

All the participants had metered taps and paid a certain amount towards water every month. This amount changed every month based on usage which was determined by the billing system specific neighbourhoods use. There are two billing systems used in Litha Park, both of which are regulated by the water management devices. There is no clear classification of which neighbourhoods are billed using which system, and it is common to find households on the same street being billed differently. The common billing system in the bond houses is a prepaid system where each household purchases water units from either the city or approved resellers and loads the units onto the water management devices, which would then cut the supply once these units are used. Some houses use a monthly billing system based on usage if there is a meter and fixed rates for unmetered users. The majority of the privately built houses are billed after use, where they have unlimited water supply and the water management devices calculates how much the household should pay to the city, depending on how much water they would have used in that month. This amount depends on each household's monthly water use and is generally charged at R61 per person in a household of four.

Litha Park

The participants in Litha Park were aware that they received free water every month, but they did not know how much of their water was free and how much they were paying for, because this was not clearly explained to them.

The households that have prepaid water meters have more flexibility in terms of how much water they can use, and they are in control of how much they pay for water. However, participants are not sure how the billing works, particularly in the neighbourhoods where they only pay after use because they often do not get billed for months and then they receive a bill ranging anywhere between R500 and R30 000, as one participant stated. On the issue of billing, a participant in Litha Park said: "The people who live in the bond houses[6] in Mandalay get billed more but that is because they are earning more". She went on to explain that in her neighbourhood, each household's bill depends on their level of income.

The City of Cape Town introduced fees called "fixed basic delivery charges" based on the size of a household's water management devices. Most households have meters ranging between

[6] Bonds are the security banks need to ensure that the client pays off their home loans. The bond means the house belongs to the bank until the full amount of the home loan has been repaid, and the bank can repossess the house in the event of failure to pay the installments.

15 and 20mm and this means a fixed monthly charge ranging from R64.40 to R115 (CoCT, 2018).

This system charged households residential water tariffs per person, and in 2019 residents were paying as little as R17.15 for up to 6 000L of water, and as much as R76.04 (CoCT, 2018). Residential sanitation tariffs range from R15.07 for up to 4200L of water and R57.72 for up to 35 000L. These were three separate charges that added up to the same water bill, hence there was confusion on the part of the residents because even if a household used less or up to 6 000L, they still had to pay the fixed basic delivery charges, along with the sanitation tariffs.

Since the water crisis, households with four people have been charged up to 20% more than a household with two people, which is problematic because it is a widely studied and a known fact that households in the Cape Flats have more people per households, while already receiving less water than the rest of the city.

Overall, most of the participants believed that water infrastructure in their neighbourhoods was better than in the neighbouring sections of Khayelitsha and two of the participants directly referred to these sections as "informal" or as "settlements", implying that they associated their own neighbourhoods with some form of formality and permanence. When asked whether she thought the infrastructure where they lived was better, the fourth participant from Litha Park said: "Yes, we have better infrastructure compared to the settlements. In the suburbs of Litha Park there is better water infrastructure than Harare, Endlovini, and Site C". The fifth participant said: "There are no street taps in my neighbourhood, but if you go to the informal settlements there are street taps everyone has access to". This illustrates how the sharing of facilities is seen as an indicator of informality and reinforcement of the temporality of informal settlements. Many of the participants believe that they have better water infrastructure because, unlike their neighbouring sections, they pay for their water. The first participant to be interviewed from Litha Park stated that: "Water is cut in the poor areas only and where the rich people live there is always water because they pay for it".

Endlovini

The water situation in Endlovini is different from Litha Park. Each section of Endlovini shares a communal street tap between about ten homes. Some participants have connected their own pipes to draw water into their own homes. For people who do not have the means to do this, the water they use for all their water needs comes from the same communal tap. For those who

have installed taps in their homes, there is some relief as they can use the water for household chores like cooking and drinking. They only fetch water from the communal taps for water-intensive chores like the washing of clothes and, in the case of one of the participants, for washing their car. Although the participants have piped water directly from the communal taps into their homes, they lack the space to perform tasks that require a lot of water because their houses are too small to wash blankets indoors for example, hence they need to go to the communal tap to do these chores. The participants believe that areas like Litha Park have better water infrastructure because the residents there pay for water. The physical arrangement of Endlovini means that some homes are closer to the taps inside the settlements, while most have to walk to the back of the settlement to the communal taps.

"That pipe (across the road) has been burst and flowing for two years now. We have gotten used to living with the water flowing," says the second participant from Endlovini, emphasizing the point that the infrastructure in Endlovini is not as well taken care of as in Litha Park. Furthermore, the quality of the pipes and taps is not the same as materials used to make the taps is below par so it cannot be stolen and sold because of theft and vandalism which is more prevalent in Endlovini than Litha Park.

An immediate observation made was that the sewage conduits in Litha Park are properly closed and properly covered, making them safe and hygienic. In Endlovini, sewers were open and overflowing, often disturbing life as the people rush past them going about their daily lives. The smell bothered one participant so much that she poured household disinfectant into the conduit to try and make it more hygienic and less smelly. Not only do the exposed sewers cause health hazards in terms of sanitation and hygiene. they also pose a danger to children, as they might fall into the sewer while playing in the street.

5.2.2 Quality of the water

Most of the participants in Litha Park said that they felt that they needed to boil tap water before drinking it because they did not fully trust the quality of tap water. In addition, some respondents resorted to buying bottled water for drinking and then using tap water only for house chores.

There is no clear understanding of what constitutes clean and safe drinking water, primarily because of a lack of educational campaigns to convey water-saving and health information. Water-saving campaigns assume that people know what clean water looks like, and such

campaigns are only communicated to people who pay for water because saving water also means the residents and the municipality save money (Kongo, 2019). However, this is evidently not always the case as all but two participants in Litha Park said they boiled their water before drinking it.

Boiling tap water before drinking it was mandatory because, as one participant said, “Sometimes the water comes out dirty, so we have to boil it and store it in the fridge”. By ‘dirty’, the participant meant that the water had a yellow/brown colour. Residents with multiple taps, drink water straight from the kitchen tap, whether treated or not because they expect that the water from the kitchen taps would be clean, despite there being one plumbing system for the whole household. During the water crisis, particularly in 2017 and 2018, most participants reported observing “colour” in the water. Consequently, most residents resorted to buying bottled water for drinking and cooking.

In Endlovini, two of the three participants had installed taps inside their homes and drew water from a communal street tap. Thus the quality of the water depended on the tap each resident drew water from. People who collected water from the street taps near the communal toilets reported dissatisfaction with the water, as they had to boil the water before drinking it. The water drawn from the standpipes that were a distance away from the communal toilets, was assumed to be clean. However, the last participant interviewed said that although she had installed her own tap, the water quality was not consistently good. She stated that: “… sometimes when we fetch water from the taps by the toilets the water would have a strange smell. Now that I have installed my own tap it does not smell as much but sometimes it still has that lingering smell. We boil the water first because of the children”.

The participants whose water came from a standpipe in the middle of the settlement could drink the water without boiling it and the first participant reported: “I haven’t encountered any problems or heard anyone say they have had diarrhoea. The water is good.” There was a similar response from the participant whose home was closest to the main road and Litha Park, who said when asked if she drank the water straight from the tap without boiling or treating the water, “The water is always clean.”

5.2.3 Response from the municipality

Two of the seven participants in Litha Park had never engaged with workers from the City of Cape Town on water-related issues. One participant sent their query to a WhatsApp number

that has been distributed for easy access to the municipal workers for various water-related issues. The most common problems for many residents in Litha Park were the drains on the streets that overflowed when it had been raining. One participant stated: "[the drain] makes it difficult to drive out of my yard", … and "faulty meters" record this as a waste of water. The participant went on to say, "If it's an urgent matter like a burst pipe we send a message to the number and they respond based on the problem." When asked if she thought the service in Litha Park was different, another participant stated, "They [the municipality] respond[s] better to us because I know someone who stays in Philippi and the drain in front of her house is blocked and the lid is open, every time she goes to report it to the municipality they don't come."

For the most part, the residents knew who to contact when they had water-related problems, however, because of historic neglect by the city many people ended up not reporting general problems like overflowing drains and instead, just waited for the water levels to subside. In addition, the participants reported that the intervals of the general servicing of pipes, sewage systems, and taps were too long and inconsistent such that there was a constant backlog of maintenance.

All the participants from Endlovini reported that it took the city at least a week to attend to water-related issues. At the time of the interviews there was a burst pipe along Mew Way and a blocked sewer that all the participants spoke about, saying that they had had such problems for almost a month. The participants' reported experiences differed slightly depending on which section of Endlovini they lived in. The first participant reported that there was no sense of urgency coming from the municipality to fix faulty taps or sewers. "Since the taps were installed there has been no additional work done on them or new taps installed. If there is a burst pipe, we sit with it until the municipality comes to fix it whenever they come," said one resident. However, the participant who had poured disinfectant into an open sewer said, "About two months ago there was a tap that was vandalised by youth on drugs who take the parts to sell. We saw a lot of water come out, and the municipality sent people to repair the tap and replace it with components that cannot be sold." This speaks to the city's level of prioritization of water conservation over the general maintenance of the infrastructure.

The households closer to Litha Park still received relatively better service when the city responded than their counterparts in the newer section, close to the communal toilets. However, because of past failure to act with urgency, the participants reported a reluctance to report any

problems because they knew they would not be fixed. Moreover, the residents continued using the defective taps or sewers because they had no choice. As the last participants said: "If the drains are full, it takes a very long time before it is fixed. There is currently a blocked drain on the other side, and it is overflowing, and we have nowhere to discard dishwashing water. People with their own toilets use them in their homes then discard the sewerage into the drain, leaving it overflowing."

5.2.4 Engagement between residents and municipal workers

One participant in Litha Park who had engaged with municipal workers via the WhatsApp number dedicated to communicating urgent water-related problems, reported a satisfactory response, saying, "They were very helpful when I reported a problem with my meter box."

The participant went on to say that the municipal workers who came to help them were friendly, very swift and fixed the problem efficiently, and with a positive attitude. According to the participant, this could have been because of the area they lived in, where it is well-known that they pay for water. This assumption is based on the respondent's interaction with residents from neighbouring sections who had been reporting similar problems for a long time with no help from the City of Cape Town. One participant went so far as to say that different neighbourhoods within Litha Park had different experiences. "We are not getting the same treatment and they [workers from the municipality] check where you live before you can be helped."

One participant in Endlovini communicated with workers from the municipality coming to respond to a maintenance-related call. The participant stated, "When they [the workers from the municipality] arrive, they will ask questions like how long the tap has been leaking and then fix the tap." Another participant stated having been able to reach the DWS in the past to report an overflowing sewer but having never engaged with the workers who came in response to her call. "I have only seen them [workers from the municipality] from afar and have never interacted with them."

Most of the residents in Endlovini had no expectation of services being provided. They believed that because of the fact that they were not paying for services, they had no entitlement to service delivery. Hence, they did not think that they had a right to engage with or ask the maintenance workers from the municipality any questions because they were doing them a favour by showing up.

This speaks to the apparent lack of awareness of the right to basic water provision enjoyed under the South African constitution as a human right. Moreover, although the residents do not pay for water, they were unaware that they were entitled to free water as stated in the Free Basic Water Policy, which stated that each household was entitled to get 6 000L of free water per month, irrespective of whether it came from a communal standpipe or taps within their private property.

5.3 Dimensions of Inequality as perceived by Residents in Khayelitsha

5.3.1 Historical

Six of the seven participants in Litha Park were not born in Khayelitsha, or in the Western Cape Province and most were migrants from the Eastern Cape who came to Cape Town in search of opportunities and "a better life". Due to the fact that most people came from rural areas in the 1980s and early 1990s when piped water was far less accessible than it is today, Cape Town even in the townships, had already been developed as taps and piped water were available, which was a new convenience for the area. When asked to reflect on water access in the past 25 years, most participants reported no significant changes. Litha Park has always had unrestricted access to water and the residents had always had access to piped water in and around their homes. While this was good for the residents, it meant that the same water infrastructure had been carried over from apartheid spatial planning. As a result, most of the newer settlements would not have been accounted for as the services followed the 'original' design of the settlements. Additionally, there had never been a need to reimagine new and more inclusive ways of providing water and this is a challenge today, as the population grows which puts additional strain on the existing sources of water.

None of the participants in Endlovini were born there or anywhere else in Khayelitsha, having come from the Eastern Cape. Additionally, none of the participants moved to Endlovini straight from the Eastern Cape. They had been living in other parts of Cape Town for some time before moving to their current homes. One of the participants was born in the Transkei and moved to the Western Cape in 1997 expecting a better life. Commenting on the comparison between her current life and life in the Transkei, she stated, "… We also have communal taps in the Transkei, and there is no difference between the way we live here and there. There is water and electricity. The only thing that I have here that I didn't have there is the means to make money." Two of the participants were under the age of 40 and moved to Endlovini when they met their

partners to start their families there, from Maitland and Khayelitsha A-Section. The last participant stated that before moving to Endlovini in 2006 she "... used to live in Samora when I first moved to Cape Town, and then I moved to A- Section."

There is no record of how the arrival of democracy changed things because the settlement had not yet been built. However, there are accounts of how the quality of water has changed over time, with more people installing taps in their homes.

5.3.2 Geographic

While there are no physical barriers, natural or otherwise, preventing the residents from accessing water, their very location in the city is an enormous obstacle. City officials use the spatial setting of Khayelitsha as a tool of exclusion to continue depriving people in these "inaccessible" parts of the city of basic water services. This can also be seen in how maintenance is carried out, and how the residents' complaints about burst pipes are trivialized.

Two of the participants from Litha Park said that city officials had told them that it was difficult for water to be conveyed to Litha Park through pipes because the area is on a hill, and the incline makes it difficult and sometimes impossible for the water to travel "upward". This would be valid if the same problems with pressure were encountered by residents who live in other parts of the city on hills and sand dunes like Hout Bay. Considering that there are areas more elevated in the Southern Suburbs, this is not a valid reason to deprive people of water because the affluent elevated areas always have water. The only explanation for inconsistent water services in the Cape Flats in general is the fact that the municipality is using poor spatial planning as an excuse to justify their negligence when it comes to making sure that all residents have equal adequate access to clean safe water.

In Endlovini, not only is spatial setting a tool of exclusion there is also the temporal nature of the settlement which lets the municipality get away with not meeting the residents' basic water needs. Lastly, the added element of crime and the notoriety of the area means that whenever complaints are lodged from this part of the city, the response time might be longer than usual, thus potentially leaving urgent matters unattended to until it is "safe (for maintenance staff) to do so".

5.3.3 Scarcity

In Litha Park, the water supply was cut during the water crisis and these periodic water cuts lasted no more than two days each time. Moreover, the participants reported that the water supply was never cut long enough to be a problem, despite being slightly inconvenient. All the participants reported having no form of communication from the municipality to inform them when their water supply would be cut. This information was available on the City of Cape Town's website and there were several online sources circulating the schedule. However, this was not a useful way to reach out, especially to older residents who do not always have access to the internet. The residents had to source information themselves and one participant recalls "… reading in the news that there might be a day when there would not even be a drop of water from the taps". This fearmongering around *Day Zero* was one of the main reasons many residents began changing the way they used and viewed water. The realization that water was finite and could run out encouraged one of the participants to save water, stating that they believed that water supplies had been cut since the drought to "limit water usage as much as possible to make sure we don't run out of water in the long run".

The participants were aware that the City of Cape Town sourced its water from a centralized network of dams. Therefore, there should not be areas that do not receive water while other areas get water, because they are all on the same grid, even though they have different schedules of service. Most participants work in other parts of the city and sometimes noticed discrepancies between where they lived and their places of work, regarding water supply. For example, one respondent was employed by the University of Cape Town, and they noticed how their place of work in the Rondebosch area never ran out of water, even when there were water restrictions in place. Another participant was employed by the Cape Town Science Centre in Observatory, an area less affluent than Rondebosch but with the same consistent access to water throughout the water crisis. This emphasized the argument that despite these areas being visibly on different levels in terms of access to funds and resources, neither of them had ever been subject to water restrictions and that this was the reality of all properties in the Southern Suburbs. The two participants had different levels of access at home as opposed to at work.

For the participants who work in the Southern Suburbs, the disconnection between their access to water at home and at work was observed. The participants living in Litha Park recognized that their access to water resources and services was better than what the residents in the informal settlements like Endlovini experienced, but they were also aware that their own

experiences showed them to be worse off when compared to the residents of the areas they worked in. This inequality went beyond the mere accessibility of water. It was also visible in the urgency with which the municipality responded to complaints about malfunctioning water infrastructure as well as overall maintenance issues. The residents in the affluent Southern Suburbs such as Rondebosch and Rosebank where the University had most of its properties were informed of a routine maintenance schedule ahead of operations, so that they could make alternative arrangements, and because of regular maintenance, there were hardly any problems with the water supply. In addition, there are no water shortages without warning being given in advance, and during the course of the crisis the water cuts in the various areas alternated to ensure that residents were without water for the least amount of time possible. This extended to complaints lodged by residents where the city responded swiftly to calls from wealthy areas which was a very different experience to the water service delivery services in Endlovini.

Two of the participants reported that there was no water on Saturdays and Sundays every week in Endlovini. To cope with this disturbance, they did their water-intensive chores like the washing of clothes during the week, and then stored enough water to last them over the weekend early on the Saturday before the cut-off time of nine a.m. All the participants also cited the low dam levels as the reason for the water cuts, stating that they were also aware when dam levels increased, following a moderately successful rainy season, and did not expect any more water cuts at that time because there was enough water in the dams. The first participant stated, “The water was cut because it was not raining and we were told that the dams were low, now that the dams are full, I don’t expect water shortages.” There was no formal campaign issued to educate people about the water crisis or the drought and most of the information disseminated was through NGOs and the residents taking the initiative to educate themselves. When asked if there was a way of knowing in advance when there would be water cuts, the last participant responded, “No we are never told, but we have now observed that there is no water on weekends.” The lack of a schedule meant that residents had no way of planning for water cuts, and if they experienced water cuts outside of the times, they have observed patterns in, they had no way of securing enough water to last them until water was available again.

5.4 Paying for Water Services

There is an awareness that paying for water immediately improves the paying residents’ experience with, and access to, water. There is an implied contract that exists between the city

and the residents who pay for water and the residents expect to be prioritized in water service delivery and maintenance.

During the water crisis, this contract was breached by the city's failure to inform the residents clearly and constantly about the levels of water available. There was also confusion as to what the residents were actually paying for, as they did not understand their water bills. Two participants complained that the amounts they had to pay were not consistent with their water usage, and this was one of the issues that was raised when they protested against poor service delivery. One participant also said that she believed that each household's income level played a role in determining how much they were charged for water. "We use less than 50L during the week because it is just cooking and personal hygiene, but during the weekend it is more than 50L a day." Despite this relatively low water consumption, the participant stated that they would not be able to afford water if they had to pay for all the water, they used without the government giving them free basic water. While all the participants could not give estimated or exact figures of how much they spent on water per month, they all agreed that their water bills were too high. Only one participant had to pay for water in arrears because she had missed a payment and their water supply was cut.

The participants in Endlovini were aware of the differences in the way they were treated because they lived in a low-income area. Most people in the informal settlement were unemployed and "uneducated" and because the people in the bonded houses paid for water, they felt that they could not claim for the same level of services and access because as one of the participants said, "we are, sorry to use this word, illiterates, who know nothing." According to another participant, the people of Endlovini tried to protest for water and nothing happened, but when the residents of Litha Park protested a high-ranking government official came to address them. "Living in a low-income area means that we do not get the same access to services as people who have incomes. We tried to protest for water, and nothing happened. Then when the residents of Litha Park protested, a high-ranking government official came to address them. When we protest, we are ignored."

These disparities are rooted in the difference in incomes/class and the residents are aware of this.

5.5 Categorizing the Township

Due to the highly technical definition of what determines whether a settlement is formal or informal, different circumstances require different provisions. For example, in the formal sections water usage was monitored by water management devices and there was one device per stand, whereas in the informal settlements there were no water management devices installed on the street taps.

The main reason why there were no water management devices in Endlovini was because it is impossible to allocate a fixed amount of water to each standpipe because there is no way of knowing exactly how many households rely on one tap, and how much water each household uses. Water management devices were introduced in the formal RDP houses, and have since only been installed in "suitable" houses, and houses in Endlovini do not fit this criterion (Mahlanza *et al.,* 2016). Additionally, water management devices are meant to also work out how much each connection needs to pay for the water they have used and since the residents of Endlovini are not required to pay for water, it is not necessary to keep track of how much water they use. Each settlement was only allocated a specific number of assets (i.e., unmetered taps, sewers); although the number of assets provided did not always match the number of fully functional assets in the communities, primarily due to wear-and-tear.

This classification of the township as formal and informal perpetuates the inequality in access to water because the service "customers" receive depends on where they live. Residents of Litha Park range from working class to middle class, as such their complaints are met with more urgency because of where they live. The dismissal of the people of Endlovini as illegitimate residents because they have settled there without authorization is used to excuse the city's blatant disregard for their needs, and defining informal settlements as "without any authorization or planning approval" removes the burden of having to provide basic services like water and sanitation from the city because they did not plan for the residents who have settled there and thus, they are not required to serve them. This is problematic because the city is knowingly refusing to provide for its most vulnerable residents. The participants interviewed in Endlovini were unemployed, with the exception of one participant who sells food on the side of the road, and this is the reality of the majority of the people who live there where they barely earn enough for basic household needs and could not afford to pay for water if they had to.

5.5.1 Maintenance and operations

In the formal settlements (e.g., Litha Park) water supply is not determined by the number of taps, but by the number of water connections the city supplies per stand. Each of the stands would have one water connection and one sewage. How many taps are installed inside each stand is at the owner's discretion, but it gets approved by the city as each connection has a water management device. In Endlovini there is a weekly asset register in which each pocket has a list of how many standpipes or taps there are in each settlement and how many toilets (flush/container/portable) have been installed. This register is also used to record maintenance and removals if the Department of Water and Sanitation condemns certain assets and call for their removal.

Most of the maintenance is conducted on an emergency basis as the customers report defects because the city does not have permanent staff on-site and capacity remains a challenge. However, there is a schedule for the upgrading of toilets, pipe connections, and taps, which is also in part updated through the complaints network. In the formal sections there is a more elaborate plan of frequent maintenance, even though it is both reactive and proactive. This results in less complaints being lodged because maintenance is more proactive than in the informal settlements. The division also depends on calls from consumers and teams are dispatched to check if there are any burst pipes or defective sewers. The statistics from these checks, along with the frequency of complaints lodged by customers often inform projects that can then ensure that assets are always in good condition. This is not done in the informal settlements, with maintenance only being conducted when there are reports of defective taps.

5.5.2 Customer service

There is a shared call station into which customers can call/email to lodge a complaint. They are then directed either to the formal or informal depot, depending on the customer's location whereupon, they are further assisted. There is often confusion as the customers do not know whether their area falls under the formal or informal section. In an interview conducted at the Department of Water and Sanitation's head office in Belville, the researcher raised some of the patterns observed regarding the reporting tools and in response, the head technical expert for the informal settlements' division stated that, "Sometimes people will call in and say the problem is in the informal settlements, only to find out that the problem is on the main road, making it a formal section's issue". There are more complaints from the formal settlements

because the people there receive the relevant contact details along with their bills, while the people in the informal settlements do not readily have this information.

The response time to attend to maintenance issues in informal settlements is generally 48 hours, but complaints are responded to as defects are reported and a defect may require urgent attention. Issues such as blocked gullies can wait for the normal turnaround time because water is not going to waste. Water running to waste is the most common problem in both settlements. According to the head of operations in formal settlements, the biggest problems in Litha Park specifically are "no water" and low water pressure because the water management devices are set at a specific allocation per day. He went on to state: "The city always prioritizes blocked sewers and leaking standpipes because these problems compromise the health and safety of the residents, as well as water conservation." In Endlovini the biggest problem is blocked toilets and broken standpipes which also result in water running to waste.

The city officials reported having sent out a team of workers on several occasions to fix burst pipes at night because it was crucial to stop the wasting of water as soon as possible. Water conservation is particularly critical since the drought and the water crisis occurred. All three DWS employees interviewed agreed that "all hands are on deck when it comes to water conservation."

5.5.3 Interactions with the communities

The community and the city generally have a functional relationship and there is significant interaction between the two entities. The main challenge the city faces is that sometimes complaints come in through the call station but with no complainant contact details. In an area the size of Khayelitsha this can be problematic as it is very difficult to track down the exact location of the defective asset. If there is a contact number, the depot can contact the complainant to get more details before they respond. A secondary challenge is the repeated vandalism of assets (taps and pipes) that are reported as defective soon after they are repaired/replaced. This is only observed in Endlovini and not in Litha Park because the taps in Litha Park are inside homes and private properties; as such, vandalism is not a concern in Litha Park. In Endlovini, however, because the taps are exposed and not protected in any way, they are vandalized more frequently. Vandalism is often cited as the reason why the city does not respond to complaints from informal settlements with urgency, especially after hours. However, Khayelitsha as a whole has been named as one of the most dangerous places in the

country, yet danger is not emphasized as a concern hindering water services in Litha Park and other formal settlements, especially in the wealthier neighbourhoods.

5.5.4 Education and awareness

There are no awareness campaigns led by the DWS, targeted at water conservation in the communities in and around Khayelitsha. However, the Environmental Health Department has been able to disseminate knowledge on WASH by sending their staff members into the community; teaching the people how to save water, wash their hands correctly, what not to flush down toilets, and other relevant information. It was reported during the interviews that the DWS had started developing a poster to put up at each of the toilet blocks in the informal settlements with safety precautions, how to report defects, and important contact details. So far, the DWS has relied on taking the opportunity to engage with the community leadership at new asset installations and meetings. In these meetings, the community leaders are provided with water-related educational content and mandated to take this information to their constituents. This is an inert approach that misguidedly relies on the community leaders passing on second-hand information accurately. The information is often lost in translation and watered down or distorted entirely by the time it reaches the residents.

In the formal settlements, the DWS uses the platforms of the councillors, sub-council meetings, ward council meetings, and has a section at Water Demand Management and Strategy that deals with water conservation and education. They also rely on Expanded Public Works Programme (EPWP) trainees, called foot soldiers, who distribute pamphlets and educate the consumers in low-income areas with high-water usage.

The foot soldiers go to schools with the assumption that if you train a child, they are going to go home and tell the parents what not to do. This worked particularly well during the drought where people were taught not to use water to wash their hands after using the bathroom but to use hand sanitizers instead. They also have a pollution control office at Water Demand Management and Strategy where the foot soldiers go to each house to educate people on what they can put down the drains and what they are not supposed to put down the drains, and the consequences of this. These initiatives are necessary and useful. However, many of them are short-term and are not sustainable because they are in collaboration with various stakeholders that do not necessarily have the same objectives.

There is far more visibility in the Southern Suburbs and the city centre, for example, where there are posters and wallpapers urging the public to use water sparingly. These interventions are long-term and have the objective of encouraging water conservation in the hospitality industry and to continue yielding revenue and building good rapport with the tourism industry. Moreover, restaurants, hotels, libraries, and all other public spaces have switched taps off and installed waterless hand sanitizer dispensers in the restrooms.

The Western Cape province has implemented this water-saving campaign across all its districts. However, the message is only articulated clearly in the affluent areas, with the posters in English, Afrikaans, and isiXhosa where necessary. This is evidence that the city has the ability and the resources to encourage people to save water and that there is an unjust allocation of these resource. There is no official campaign in the informal settlements by the city to disseminate knowledge, with the DWS's head technical experts for informal settlements stating that they are "in the process of revising the poster" which is meant to be an informational poster to be put up in the vulnerable communities when asked what the department is doing to raise awareness about water conservation in informal settlements.

5.6 Conclusion

These findings echo Cole *et al.* (2018) that social factors such as access to water and income have greater influence on per capita water use than biophysical factors such as rainfall and runoff, because the decrease in dam levels did not necessarily change the usage in Litha Park. Conversely, the increase in dam levels in 2019 brought no changes to water access and infrastructure to the people of Endlovini because of the informal status of the settlement. This research made similar observations of the impacts of sustained low-income urban and peri-urban areas created by the apartheid government, on inequality in water access. Furthermore, Enqvist and Ziervogel (2019) explored what happens when institutions put in place for the provision of water services have failed to adapt to structural and natural changes and the result in the case study area has been inequalities within a seemingly homogenous environment. The comparisons drawn are within one township, yet they read like a comparison between an affluent suburb and an informal settlement and it is evident that the unrefined apartheid-inherited infrastructure cannot adapt as the city changes, maintaining inequality in access to water for those not recognized by the city as legitimate residents.

The greater Cape Flats area which Khayelitsha is in was never meant for human settlements

and the apartheid government, through racially biased infrastructure and urban planning, cemented the inequality in access to services between the Cape Flats and the rest of Cape Town. Khayelitsha currently has a variety of income levels across the different sections, however, the informal settlements are still worse off and are low-income areas characterized by poverty and many other social ills. Water inequality in Khayelitsha is a result of the spatial setting of the township, and the City of Cape Town's systematic negligence of the residents who live in the informal settlements of Khayelitsha. This inequality expresses itself in different ways and this study finds two distinct indicators of inequality when looking closely at the experiences of the participants who live in Litha Park, who are seen and treated as legitimate residents because they live in a formal settlement, compared to those who live in Endlovini and are denied legitimacy and basic services because they live in an informal settlement.

First is the inequality in access to water; whereby residents in Litha Park have better infrastructure that allows them to have access to clean water in their homes with many having multiple taps within their private properties, while up to ten households have to share one communal street tap in Endlovini. Second is the municipality's response to water-related problems in Litha Park being swift and proactive with regular maintenance performed on the pipes and sewers in the area, whereas residents in Endlovini have to wait for a long time before any of their complaints are attended to. It was noted during the course of this study that there was a reported burst pipe along the main road leading into Endlovini that had not been attended to for almost a month.

Chapter 6: Discussion

6.1 Introduction

This chapter discusses the findings of the study to consolidate the argument that the City of Cape Town's response to the water crisis (2015-2018) exacerbated inequality in access to water across the different residential areas of the city. This inequality is most pronounced when comparing the level and frequency of water access between informal settlements and formal settlements. The findings are consistent with the findings of other researchers (Kongo, 2019; Mahlanza *et al.,* 2016) who found water inequality in Cape Town to be sustained by apartheid-framed service delivery and miseducation or failure to educate the city's residents about water resources and services. Secondly, the study identifies a lack of commitment from local government structures to develop water governance policies that ensure that people who live in informal settlements are receiving adequate water as all citizens of South Africa are entitled to (Enqvist & Ziervogel, 2019; Dugard, 2009; Maphela & Cloete, 2019). Following a critique of the applicability of John Rawls' (1999) theory of justice, this study offers new insights on water inequality at the micro level, within the same geographical area, by highlighting the differences between the water services residents in the formal as opposed to the informal sections of Khayelitsha receive. The theoretical considerations of this study require a location-specific approach to addressing water inequality in Khayelitsha that may be applicable across the greater Cape Flats area, while acknowledging that water inequality varies as the points of reference change.

6.2 Interrogating Water Inequality

Both Litha Park and Endlovini experience limited water services when compared to the Southern Suburbs, despite the obvious disparities between the two areas. In addition, water service infrastructure in the general Khayelitsha area is not as well maintained as infrastructure in places like Rondebosch. Due to the proximity of Litha Park and Endlovini, it is not uncommon to group the areas as one and to discuss water inequality in the two areas in similar terms. However, this study finds that the residents in the two types of settlements experience water service and inequality differently. The residents in Litha Park are somewhat unaware of the improved access they have because they compare their experiences regarding water services to the services in Rondebosch and Newlands, not Endlovini or any other informal settlements. Moreover, the people in Endlovini look at their experiences with water in

comparison to Litha Park and not Rondebosch or Newlands. This perspective overlooks the fact that there is some level of swiftness in the way complaints from Litha Park are attended to, whereas residents of Endlovini have no option but to go for extended periods with malfunctioning or absent infrastructure. This highlights the reluctance of the residents of Litha Park to view themselves as having better services because in the grand scheme of things, they are still at a disadvantage. This section extracts and contextualises these dynamics from the findings.

(a) Exclusionary civil services fosters water inequality

The findings of this study reaffirms the age-old plight of the many township communities in the Western Cape province where black and coloured South Africans have been protesting for access to water resources and services (Enqvist & Ziervogel, 2019). The residents of Khayelitsha, specifically the informal sections, experience frequent water shortages that the rest of the city is not subjected to.

The residents of Endlovini often have to go several days at a time without access to water from their communal taps and have to ask their neighbours in other sections for water. This unexplained and regular interruption to water supply means that residents must plan around an unpredictable schedule when they are already at a disadvantage in terms of capacity to store water in their homes; given how far the taps often are from most households. While the residents in the formal sections of Khayelitsha have a better and steadier supply, they also still experience water shortages, albeit not as frequently as in informal settlements. This shows that townships are being treated as the experimental zones where the city can cut water supply to mitigate city-wide water shortages, reaffirming the argument that the city does not consider the residents in townships as deserving of the same efficient and consistent water services as the residents in other suburbs of Cape Town.

(b) Poor infrastructure limits access to water

Apartheid spatial planning sustains water inequality by rendering certain parts of the city inaccessible due to historical structural and social hurdles. Employees of the City of Cape Town cite crime as a reason why they fail to maintain functional water service infrastructure in the Cape Flats. However, there is no incentive to overcome this because the people affected are considered illegal settlers because they live in informal settlements. This poor infrastructure coupled with negative perceptions about the people living in townships and informal

settlements means that people in the poorest parts of the city do not have access to clean drinking water and no efforts are being made to remedy this because the current spatial arrangement of the city still serves the affluent areas in similar ways as they were served under the apartheid government. Due to the historical disregard for the people living in informal settlements, there is no sense of accountability on the city's part to maintain water infrastructure in informal settlements because the predominantly black, and coloured disenfranchised population groups have always been considered as inferior citizens.

Water inequality in the City of Cape Town is not only expressed through access to running water in the context of volume/quantity, but also in accessibility to water resources. The installation of water management devices in poor communities, as discussed in this study, is a common challenge faced in many townships across South Africa. The residents of Litha Park have informed the City of Cape Town of the impact these devices have had on their access to water to no avail, much like the residents of the township of Dunoon, as studied by Mahlanza *et al.* (2016). However, differences have been shown in local governments' responses to protesting about water management devices across the various South African major cities. The residents of the township of Soweto in the City of Johannesburg took the city's water company to the Constitutional Court, arguing that the installation of water management devices along with other instruments of the Free Basic Water Policy were unconstitutional (Dugard, 2009). The Constitutional Court ruling was unfavourable to the residents and the City of Johannesburg was not required to adjust the monthly provision of 6 000L per household, as set out by the Free Basic Water Policy.

(c) Punitive water policies marginalise informal communities

The installation of water management devices in the poorest sections of the city and not in the wealthy households in the suburbs is another expression of water inequality that limits what residents can do with water (Enqvist & Ziervogel, 2019). Water management devices are contested because they register water lost to leaks due to poor maintenance as water used. In this way, the government continues to charge poor households for water they did not use and perpetuates this cycle by failing to fix leaking taps in townships. Moreover, Mahlanza, *et al.* (2016) found that the water management devices installed in Dunoon were installed without their true functions being explained to the residents thoroughly, and this was an experience observed in this study in Litha Park, where the participants had not been made aware of the functioning of the water management devices. Additionally, water management devices in

Litha Park were reported to record overuse even with normal consumption because they are designed for households with few users.

Mahlanza *et al.* (2016) argued that residents in low-income areas in Cape Town also do not understand the financial implications of water management devices, because the municipalities do not fully explain what cost-recovery oriented water provision entails, and these deliberate exclusions of knowledge and information amplify the inequalities that prevail regarding water access. Cost-recovery oriented water provision means that the residents are not entitled to contribute to water-related policies and the government autonomously determines the legislature and annual rates for water services in consultation with experts from the water sector. This further translates into a lack of community-based engagement and representation of the various realities at forums and conventions where the important decisions are made.

The City of Cape Town is the authority and they do not consider it necessary to explain anything to the residents, especially in the informal settlements, where engagement is already minimal. The campaigns launched by the city that claim to be educating residents on the importance of saving water were preceded by fearmongering, the most widely researched being the infamous *Day Zero* that instilled helplessness in the people who were and remain removed from the centre of discussions and policymaking.

The City of Cape Town's justification for installing water management devices in the RDP houses in the formal sections of Dunoon Township was to save water by helping residents and the municipality to identify leaks to "have them fixed, which helps households avoid large water bills that they are unable to pay" (Mahlanza *et al.,* 2016).

Mahlanza *et al.* (2016) focused on lived experience to examine justice and fairness in access to water services in the informal settlements of Dunoon. The study concluded that from the residents' perspective, water management devices had restricted them from their right to water access. The monumental *Mazibuko and Others v the City of Johannesburg and Others*[7] case (2009), filed by the residents of Phiri, Soweto, against the City of Johannesburg echoed this

[7] Mrs Lindiwe Mazibuko and four other residents of Phiri, Soweto (the applicants) challenged the City of Johannesburg's implementation of the Free Basic Water Policy's constitutionality, and the lawfulness of the installation of prepaid water meters in Phiri. The respondents were the City of Johannesburg; Johannesburg Water, and the national Minister for Water Affairs and Forestry. Constitutional Court, concluded that it is not appropriate for a court to give a quantified content to what constitutes "sufficient water" because this is a matter best addressed in the first place by the government (Constitutional Court of South Africa, 2009). The Constitutional Court ruled against the applicants on all grounds (Dugard, 2009:177).

sentiment and called into question the City Water Company's commitment to providing free basic water as per the Constitution and the DWAF's White Paper on National Water (Dugard, 2009).

(d) Water is a commodity and not a basic human right; thus, it is cost-driven

The City of Cape Town treats water as an economic good. This commodification of water is in line with capitalist outlooks on natural resources and treats residents as consumers, instead of beneficiaries of the state's provision of a basic human right. By framing residents as consumers and users, the city inadvertently creates a hierarchy whereby the residents who can and do pay for water are prioritized over those who cannot afford to pay for water. In areas like Khayelitsha, this classification is complicated by the problems caused by inadequate infrastructure. In the formalised sections, many households cannot afford to pay for water but are forcefully equipped with water management devices that make access to water impossible without payment. For those residents in informal sections, the commodification of water enforces a culture of complacency where the residents do not feel entitled to services because they are not consumers. As such, the residents in informal settlements do not feel that they can hold the local government accountable for poor water service delivery because they are not paying for these services. Lastly, this study finds a third category of water users who are in the perilous position where they do not meet the FBWP criteria of indigent, and thus cannot qualify for free basic water provisions, as they do not generate enough income to afford to pay for water. For these households, the cost of water is too high, even though they may able to generate some form of income.

(e) Poor, exclusionary communication reinforces water inequality

Lastly, this study finds exclusionary communication and problematic labelling of the people who live in the informal settlements as a significant contributor to water inequality. The ways in which the city speaks to and about people who live in informal settlement cultivates an attitude of disregard in the employees who are supposed to service them and a lack of compassion in the neighbours who live in the formalised sections who are in a position to help when there are water cuts in places like Endlovini. In addition, the residents in informal settlements are a manufactured illiterate "Other" group which means they are excluded from the consultative processes that result in policy around water. This deliberate rejection of their lived experiences means that the water-saving campaigns do not reflect their realities and end

up being harmful to the informal residents. Alternatively, these exclusions mean that none of the city's water campaigns reach the informal settlements; as was highlighted in this study, where the Water and Sanitation Department reported not having any educational programmes and visibility in informal communities educating people on how to save water, even at the peak of the water crisis.

6.2.1 Understanding water inequality

Water inequality is experienced differently across different global contexts. This study finds that there are multiple expressions of water inequality in the case study area that may be similar to most global experiences. However, these experiences are still unique due to the environments they happen in. As such, this study highlights the importance of treating water inequality as a location-specific concept. Water inequality is caused by the unequal distribution of already scarce water resources. Water scarcity is categorized into two main contexts across the global, regional, and national levels, where people experience difficulty in accessing water, due to the lack of availability of the resource, or where access is limited due to affordability issues, despite the resource itself occurring in abundance.

These expressions of scarcity can and often do overlap, and both affect the impoverished far more than those who can afford water, even in relatively water-abundant countries. The study finds that the 2015-2018 water crisis was, as argued by Wolski (2018), a result of both the shortage of the natural occurrence of water as well as a failure in water governance. However, the residents in Litha Park and Endlovini were not educated on the implications of these overlapping conditions of scarcity and hence experienced the most inconvenience. Failure to address water scarcity means that the inequality in access to water is also not addressed during periods of severe scarcity, because the distribution patterns are not revised to account for unusually low levels of available water.

6.2.2 Framing water inequality through the justice lens

Rawls' (1999) theory of justice sets a precedent for the inviolability of the liberties and benefits of every individual in an ideal society that could not be overridden even by the collective welfare of the society. These rights, as they are framed in South Africa, are protected by the Constitution (1996). The government has an obligation to ensure that they are met and protected by all means necessary and are available to the state. This study has identified water

as such a right, and section 27 of the Constitution (1996) through the Bill of Rights, protects this right. As such, one condition of the Equal Liberty Principle is met in Khayelitsha.

This study shows that there is inequality in the level of access in the different parts of Khayelitsha to water resources and services. To remedy this inequality and to achieve equitable distribution of water across the City of Cape Town, Rawls's (1999) theory of justice would call for the Difference Principle to be applied, which calls for inequality as long as it created a fair and just environment for the equal distribution of services. Correct application of the Difference Principle would benefit the residents in low-income areas by fostering a system of distribution that makes sure that they receive adequate free water. The City of Cape Town's water distribution is not justice-framed and does not allow for the application of the Difference Principle. This is primarily due to the current social order that prioritizes affluent areas in public services; and the poor infrastructure left by the apartheid government renders townships and informal settlements insignificant in the distribution of resources in the city.

A justice-centric framework to water supply is possible but requires a shift in the current distribution patterns to involve local stakeholders across all sectors of public life, to ensure fair distribution to all parts of the city. In informal settlements particularly, a robust and innovative approach to making use of the limited space to install taps is necessary to reduce the number of households reliant on one tap. Moreover, changes effected in other parts of the city should be explored as they can also have positive results on the township experience of water access. For example, the pressure and demand created by big businesses and homes that are classified as large consumers of water could be better managed to prevent the frequent water shortages in the Cape Flats, due to "maintenance" issues. The city relieves pressure by water-shedding the informal settlements, while supply to the wealthy suburbs remains constant. Application of the Difference Principle would allow for adjustments to the city's water maintenance schedule, such that if it were absolutely necessary to cut water supply then this would occur in a fair and efficient manner, whereby all residents play a part in saving water.

The adjustments warranted by the Difference Principle also require a shift in institutions and policies. This depends on Rawl's (1999) Equal Opportunity Principle which is tasked with ensuring that the conditions under which people compete for public office in institutions are fair and afford people of equal talents equal opportunity. This is the most difficult principle of justice to attain, especially in the Western Cape. Elections for public office are heavily influenced by party politics which are subject to political bias. As such, people who live in

informal settlements often cannot run for office, because they do not have big political parties endorsing their candidacy, thus leaving their communities without representation at provincial and national governments. Consequently, they are unaccounted for in policymaking processes. Therefore, a city-wide effort is necessary to ensure that the basic human rights of the poorest residents are protected. This means opening up the political processes that result in policy changes to water provisions, to ensure fair and equal representation of all the residents in the City of Cape Town; to make sure that all experiences are considered and catered to in the important decisions taken regarding water services and provision.

For Rawl's (1999) theory of justice to be applicable in this case study, the means used to test individuals' eligibility to compete for positions and run for office in institutions would have to be redefined to ensure that currently marginalised groups such as residents of the informal settlements are able to participate fully in policymaking. The city would also need to shift the water budget to allocate more water than the current 4% to go to informal settlements. Using the Free Basic Water Policy (2001), the city would need to allocate the mandatory 6 000L per month to every indigent household, with a targeted distribution plan for informal settlements, before allowing residents in high-income areas, and high-consuming businesses to buy additional water.

This is not being enforced because there is no way of measuring how much water each individual household in an informal settlement receives because the taps are communal. Without individual standpipes allocated to each household, there is no way to say whether the Free Basic Water Policy is being implemented because every household theoretically has unlimited access to water if we do not consider the practical factors that make access to this water difficult. This targeted redistribution demands real and radical transformation that is evidently not an option as the city's future water plans are unclear; which is alarming because the 2015-2018 water crisis was a result of a failure to pay sufficient attention to experts' forecasts, and a poorly planned water strategy that was only enforced when it was already too late (Wolski, 2018; Muller, 2017).

6.2.3 Locating Khayelitsha in global water governance discourse

The emergence of informal settlements and the subsequent denial of the human rights of the people who live in them is not unique to Khayelitsha, or to South Africa. Drawing from the experiences of the informal settlements of Kibera slum in Kenya, Mutisya and Yarime (2011:198) asserted that people living in informal settlements are trapped in their situations

because they are “excluded from the rest of society”. This exclusion is common in low-income areas across the world, particularly in urban settings, and the residents of these areas are seldom considered when policies are being drawn-up to improve the living conditions in the city. However, in other parts of the world, informal settlements were not created to maintain racial segregation, as was the case in South Africa. The case study area is unique in that the exclusions of its residents prevailed, even when colonialism ended and the apartheid era arose, ultimately becoming a feature of democratic South Africa. Informal settlements are a growing part of the current urban landscape, as more people move from rural to urban spaces. This study highlights the challenges of water inequality that threaten to keep the residents of informal settlements without sustainable access to water, if not addressed.

Municipalities charge residents for water resources and services because the cost of treatment to make available water clean and safe for human consumption is increasing. As such, various actors have come together to define and strive for global water governance. The initial priority was to secure as much drinking water as possible, especially in parts of the world that have always had developmental challenges. However, as more evidence of the detrimental impacts of building large-scale dams on the natural environment and vulnerable societies came to light, global water governance shifted from large-scale dam and infrastructure construction to policy-driven improved management of existing water sources, while protecting the natural environment and impoverished societies. While water scarcity is a universal crisis, global water governance is still limited as states are constantly redefining their national and regional scopes for sustainable development (Cooley *et al.*, 2013). Looking at these limitations, Cooley *et al.* (2013) argued that the current global water crisis is, in fact, a crisis of governance. This is the point at which this study enters the discourse, attempting to locate the realities of the residents of the informal settlements of Khayelitsha in the global water governance discourse, to assess water inequality in Cape Town as a function of failed global water governance.

Water governance in South Africa is outlined and facilitated by the national government, with local municipal water providers being the instruments of the distribution of water within their constituencies. Local governments have few freedoms over their water reserves and the Western Cape province is one of the few provinces where municipalities have set a precedent of autonomy in the distribution of water. This contrasts with the approaches of countries like Uganda to water governance where local communities have a significant role to play in the acquiring and maintenance of water service infrastructure and may be expected to contribute

financially towards the installation of taps and pipes (Naiga *et al.,* 2015). This distinction helps to align this study with Kongo's (2019) argument that residents in Khayelitsha do not have the incentive to save water because (a) they still see water coming out of their taps even during a drought, and (b) they are mostly unaware of the processes of securing water beyond their taps, because they are not involved in any of these processes. This presents them as passive and reproduces the narrative that people in townships rely on the government without taking initiative for themselves, even though it is clear that they are being excluded. The Western Cape province has failed to make water governance a truly inclusive and fully representative element of its urban management strategy, by avoiding the responsibility of having to include poor residents in the policymaking decisions related to water services. This approach treats water as something poor residents are not welcome to discuss and to be grateful for, without scrutiny.

6.2.4 The water crisis and challenges to Free Basic Water Policy

The Free Basic Water Policy (FBWP) was enacted to ensure that all South Africans, especially the poor, have access to basic water. However, the policy has not been able to achieve this with many households who qualify still not receiving free basic water (Farrar, 2014). As such, many households in low-income areas have had to cope with limited access to water since the dawn of democracy. At the peak of the water crisis in 2017, the City of Cape Town was urging its wealthy residents to look to residents in low-income areas like Khayelitsha for insights on how much one can achieve with less than 25L of water per person per day. This is the minimum the World Health Organisation (WHO) recommends as the acceptable amount of water governments are obliged to provide to every person per day under their jurisdiction (UNESCO, 2019). This amount is still not enough given the dynamics of the households in Litha Park and Endlovini where on average, each home has a minimum of four people.

The city's water governance policies, like the Free Basic Water Policy, did not take the average household structure into consideration when determining how much free water each household should receive, applying the same logic that was applicable to wealthy households with fewer people. Applying the Difference Principle suggests introducing inequality into the current water distribution system to ensure that households would not receive adequate water are prioritized and allocated water, according to how many people live in one household. While this does not mean that every single household will be treated differently, a system that acknowledges household dynamics in informal settlements could be adopted.

The city's water governance policy treats water as an economic good, and not as a public good, in order to recover costs to ensure that it can afford to buy and sell water. Treating water as an economic good creates an unjust distribution pattern in which the paying customers are prioritized over those who cannot afford to pay for water. This capitalist outlook on service provision coupled with socialization, reinforces the idea that those who cannot afford to pay for water do not deserve water services. Thus, in supplying the customers the city has provided water to those it has a contractual obligation to, even though this does not comply with the 'citizens as users' perspective which frames access to water as an undeniable human right (Thompson, Masiya, & Tsolekile de Wet, 2013).

To combat this, the eThekwini Municipality in the KwaZulu-Natal province began integrating low-income areas into the metropolitan water supply grid, providing water as both an economic and public good to all, depending on their economic standing (Sutherland *et al.*, 2014). Maphela and Cloete (2019) provided a historical context of the policies that manage South Africa's water resources, to illustrate the origins of the systemic racial inequalities in water services which fostered, and still maintain water inequality. Using the National Water Act (1998) as an adjustment of the Water Act (1956) to redress racial injustice, Maphela and Cloete (2019) analysed the integration of different income level households into the same area, and their experiences with the City of Johannesburg's water services. The system was not perfect, and a backlog remains in incorporating former homelands into the grid of basic water delivery systems, but it was the beginning of prioritizing a rights-based method of water provision, which we can draw from in trying to ensure just and equitable access to water in Khayelitsha.

Municipalities geared towards cost-recovery view and handle water as an economic good, and not as a public good, limiting low-income communities' access to a basic human right. The commodification and commercialization of water follows neoliberal economic practices and suits the wealthy few, while keeping the impoverished along the periphery from accessing water as they cannot afford to buy it (Dugard, 2009). Additionally, the business-friendly tariff policies that come with the commodification of water push up water prices such that even those who earn an income struggle to keep up with water costs (Dugard, 2009).

Households negatively affected by water being an economic good, are in the difficult position between being on the poverty line and being classified as "low-income". These are households that are not classified as indigent by the Free Basic Water Policy, and thus they have to pay for water at competitive rates; and yet they are not earning enough to afford water without

compromising on other household needs. This engenders inequality in their access to water because they are not poor enough to qualify for 100% free basic water but are still too poor to afford to pay for water but are being charged like the rest of the paying customers.

The Free Basic Water Policy frames water as a basic human right that all South Africans are entitled to. Furthermore, it provides a framework and tools to ensure that this is realised through a means test, to determine which households are eligible for free water. As such, it can be a way of implementing the Difference Principle by only availing free basic water to those households identified as being unable to afford water, while the rest of the residents who can afford water are expected to pay for water services.

The policy is not without challenges; the main one being the means test and deciding what attributes are qualifiers. In addition, the status of "indigent" is a blanket category that is applied to a large group with different material circumstances. For example, to qualify, applicants need to be in possession of valid proof of residence and a standpipe. This is not always possible for households in the informal settlements as they rely on shared communal taps and best fits the lived experiences of people in lower income, but nevertheless formalised sections of the township. To fully realise Difference Principle objectives, the FBW parameters need to be broadened to accommodate multiple living situations and consider the challenges that come with living in an informal settlement that may not be felt in other poorer communities.

6.2.5 The implications of spatial inequality on water inequality

The disparities in the physical arrangement of houses in Endlovini and Litha Park are immediately striking. On one side of Mew Way is Litha Park, which is divided into sections comprising a mixture of bonded houses and houses people built for themselves in clearly partitioned neighbourhoods with streets and relatively orderly plots. The yards are spacious and the homes big and of suburban standard. Each home has several taps inside (kitchen, toilet, bathroom), and outside, and often people do not have to step outside their homes to get water. In addition, every home has a toilet inside and good sewage facilities. There are no street taps in Litha Park because they are not necessary, and the only shared water-related infrastructure is the drains and sewers on the streets that, when full because of rainfall or because of a maintenance defect affects all the residents.

The biggest geographical factor that hinders efficient water service delivery, according to the city, is the location that Khayelitsha is in. The underlying geomorphology means that the area

is prone to floods, and that infrastructure is then compromised also. Additionally, most of the participants who live in Litha Park have been told that their area is high up on a hill which makes it difficult for water to flow upwards. Having been in the space, the researcher knows that it is elevated, but certainly no higher than Bishopscourt or Vredehoek, and no sandier than Hout Bay, yet these areas never struggle with water supply. Khayelitsha was deliberately built in an area where it is difficult to provide services because it was never meant to receive any of the services the rest of the city was getting at the time of its inception. However, the formalization process and areas like Litha Park are proof that Khayelitsha's geographic location is not an insurmountable obstacle and that water services can be provided to these areas if the political will is there.

The City of Cape Town's water distribution network and practices follow the apartheid model of service delivery which often leaves people in the informal settlements in sub-human conditions (Cole *et al.,* 2018). However, this is masked as a socio-economic problem, and not related to racial zoning. Nevertheless, it determines the direction of the flow of resources despite South Africa's efforts towards redressing the injustices caused by the apartheid government. Experiences from eThekwini (Sutherland *et al.*, 2014), Soweto (Dugard, 2009; Maphela & Cloete, 2019), Dunoon (Mahlanza *et al.,* 2016) and Khayelitsha (Ziervogel, 2017) illustrated that the remnants of apartheid spatial planning have a direct impact on socio-economic and policy-related decisions that determine who gets access to water. Maylam (1995) argued that class/economic inequalities are racial in origin and stem from the morphing of the apartheid ideology of segregation into "difference", in democratic South Africa. By framing racism as classism, the narrative on access to water resources and services becomes strictly about the means of production, as opposed to questioning who benefits from these means of production.

The impact of crime on access to water in Endlovini is a secondary issue, as the underlying issue is the historic dynamics in the city's spatial arrangement. Structural poverty and unemployment will always present social ills in any society whose urban spaces were designed for segregation, racial or otherwise, as the end goal. The distance between the taps and people's homes leaves them vulnerable to violence after dark. Like millions of societies across the continent, gender roles and norms dictate that the responsibility of fetching water lies with the women and girl children, and they are the most vulnerable to violence. There is a lack of motivation to provide better water access in informal settlements in the form of more

standpipes; and this is evident in the city's apathetic response to broken street standpipes, despite the widely documented occurrences of crime residents fall victim to while fetching water. This inequality is compounded by the fact that many households cannot afford to set up water infrastructure in their homes to draw water from the communal taps directly into their homes. Moreover, the communal arrangement of the taps means that even if there was an individual household with the financial means to fix a broken standpipe or sewage, they cannot do repairs because the equipment does not belong to them.

There is a massive communication gap between the residents and the city officials, and this translates into how the people perceive themselves in relation to the city. This influences the residents' ability to hold the government accountable when they are not receiving adequate quality water services. The residents are referred to as customers and this is also reinforced in the Free Basic Water Policy which frames municipalities as designated water service providers. Even in progressive cities like eThekwini, the national government remains the provider and custodian of water, while the local governments are customers, hence, cost-recovery is the main concern for their water governance policies. This customer/service provider relationship is partially why the people in Endlovini respond to inconsistent services with resignation because they do not belong in the equation of service provision if it depends on payment. The fact that they are not paying for water makes them accept their situation and not demand services from the city and from government in general. Their homes are referred to as dwellings, and those in Litha Park or any other formalized section are referred to as houses. This may be subconscious on the part of city employees, but it can also be a method of socialization to move away from the official viewpoint of informal settlement which emphasizes criminality and temporality.

Interactions between the city and the community are minimal and restricted to finding out what problem a resident has and dispatching a team to fix it, often without post-operational consultation to make sure that the customer is satisfied with the service. This is observed across many sectors of government where civilians do not feel entitled to get information and assistance because there is an authoritative element in the way government officials and technical workers deal with them. This study notes the contrasting experiences felt by the residents of Khayelitsha who worked in affluent areas like Rondebosch when there were water-related problems at their homes, compared to their workplace.

The policing of state resources in poorer areas means that many citizens do not have the confidence to complain if they are unhappy with services because they are not given any encouragement to do so. This passive engagement on the part of the city creates confusion and frustration when customers receive unusually high bills at the end of the month when there would have been ample opportunity for these issues to be sorted out had there been a culture of open communication between the municipality and the residents.

Service delivery protests in Khayelitsha have been happening for more than ten years, with 10% of the residents, predominantly in the informal settlements, still not having access to running water and sanitation facilities (Enqvist & Ziervogel, 2019). When the residents of Endlovini protested for water services to be improved, they recall having had no response from the city. However, when the residents of Litha Park took to the streets in protest about the same issues, they were met with a more engaging attitude, a high-ranking official went to address them, and their concerns were taken seriously. Moreover, the city's departments and personnel are not seen in the informal settlement communities, hence there is very little faith in government structures because officials are not seen doing work on the ground while NGOs are perceived as doing most of the groundwork. There is a greater presence of NGOs in the communities than municipal workers. This trend follows reported experiences from many rural areas in South Africa where NGOs are involved at grassroots level and are more invested in community development than in local government. This further creates a divide between employment and service, and it is difficult to establish good relations between the municipality and the community when they are not visible in the communities, but people know that they were employed to be of service to the residents.

There is a clear separation of responsibilities within the Department of Water and Sanitation. However, this separation is not clearly communicated to the communities, if at all. There is confusion with regard to which division each of the areas is expected to contact for maintenance queries and this adds to the residents' frustration. When complaints are lodged, they are processed through the same call station, and then the caller is redirected to the relevant depot. This means that there is no direct contact line that the residents of either Endlovini or Litha Park can call, hence most of the participants do not know who to contact in the event of a burst pipe or blocked sewers.

The ability to report water-related problems also requires airtime to make the necessary calls and this is something the residents in Litha Park take for granted. For the residents in Endlovini

whose livelihoods are not secure, something as trivial as airtime can be the decider between a week of inconvenience, or a week without food. All the earnings that are made are spent on food and other essential household expenses. Hence it is commonplace to come across people who are inconvenienced by an overflowing drain or a leaking tap but simply do not have the means to report it.

Despite their financial limitations, the people in Endlovini have a more proactive approach to water conservation than the people in Litha Park because their circumstances do not allow them to be wasteful with water. They are also aware of how much water is consumed in the households because they can only store a few 10L buckets of fresh water at a time, due to a lack of water storage infrastructure. In addition to the absence of the infrastructure such as plumbing to allow for the installation of showers and baths, the communal taps are often far from the homes and the people in Endlovini use water sparingly because they have to budget for water that will carry them through the night, because of the crime rate which makes it very dangerous to leave their homes after dark to go to a communal tap. In the same way, the people in Endlovini are more aware of the implications of the water crisis, and while they do not use the same vocabulary as the experts, there is a clear understanding of the basic causes of a water crisis, despite the city's failure to disseminate knowledge about the water crisis and its implications for especially poor households.

The people in Litha Park use more water than those in Endlovini because they can afford to do so, and they have the capacity to do so through the availability of infrastructure and easy access to water in their homes. Their buying power affords them access to water that their counterparts in Endlovini do not have access to. Most households in the more affluent areas of Khayelitsha such as Mandalay have washing machines and dishwashers which use a lot of water, but because the residents there pay for water and thy believe they use what they have paid for, they continue using these water-intensive machines throughout the drought because of convenience. There is also no incentive to save water outside of the crisis period because they have a sense of security because they live in a formal, recognized permanent settlement that will always be equipped with adequate water services infrastructure. During the drought, most of the residents in Litha Park received more communication on the drought, the water crisis, and *Day Zero* through pamphlets and posters than people in the neighbouring informal settlements such as Harare and Endlovini. However, despite the overwhelming presence of information, many people did the minimum, and some effected no changes at all in their lifestyles with regard to

water usage. Many people bought bottled water for drinking because they thought the municipal water was not fit for human consumption, but they continued to wash clothes, cars and perform other household chores using tap water without curtailing the volumes they used. For those on the prepaid water billing system, the presence of water management devices created a false sense of saving water because their water supply was capped.

There seems to be no incentive for the local government to upgrade Endlovini into a formal settlement, and since initial communal taps and toilets were installed in the early 2000s, there have not been any more taps installed so households have to rely on a single tap, and the existing taps have not been upgraded. The City of Cape Town's Water and Sanitation Department's informal settlements division had no long-term plan to disseminate water-related education to the community. Instead they relied on the work done by NGOs and other departments. This meant that any educational material disseminated was not uniform and reached the different parts of Khayelitsha at different times. Areas like Endlovini reported not receiving any awareness material at all, even during the water crisis. This study problematizes this deprivation of knowledge, which further widens the inequality in access to both water resources, and knowledge on how to manage these resources effectively. More importantly, this lack of information makes it difficult for the residents in Endlovini to lodge complaints, as they do not have access to lines of communication to the city as readily as their counterparts in Litha Park have. This study illustrates how biased dissemination of knowledge and the exclusions it enforces can be a function of water inequality.

6.3 Conclusion

This chapter interpreted the main findings from the research process to make meaning of the patterns and perceptions found in the analysis of the data. These findings were then placed in the context of the broader discourse on water inequality in South African townships; drawing from studies conducted in Khayelitsha Site C (Kongo, 2019) Phiri in Soweto (Dugard, 2009; Maphela & Cloete, 2019) in the City of Johannesburg, and Dunoon (Mahlanza *et al.,* 2016). This study illustrated that although the inequalities in water services experienced in the study areas are worth isolating from generic discourses on water inequality, the level of inequality is still even more pronounced when comparisons are drawn between the wealthier suburbs of Cape Town and the informal settlements on the Cape Flats. Guided by John Rawls' (1999) principles of justice, the chapter alluded to theoretical considerations that may be applicable as a way of studying water inequality in Khayelitsha. The insights offered by the study will be

useful in localising research into informal settlements within townships, to highlight the inequalities that exist within spaces that are often treated as one.

Chapter 7: Findings, Conclusion, and Recommendations

Guided by the research question "How does the City of Cape Town's response to the water crisis further perpetuate water inequality in the impoverished communities of Khayelitsha?", this qualitative study sought to (a) explore the unique relationship the residents of Khayelitsha have with water, especially during periods of scarcity; (b) identify and evaluate the social dynamics that foster unequal distribution of water resources that maintain oppressive structures and systems in the City of Cape Town; and (c) highlight the disparities in water delivery caused by the people's different locations in Khayelitsha. These objectives illuminated the water inequality faced by the communities in the study area and exposed the nuances that exist in analysing water inequality within an area that is seemingly seen as monolithic. Noting similarities from the experiences of Soweto and Dunoon, this study brought Khayelitsha into the broader discourse of water inequality; especially in South African urban areas, to argue that water distribution must follow a human rights-based model that prioritises the social good status of water over simply yielding revenue from it, in poor communities.

7.1 Summary of Key Findings

This study made five key findings which are grouped into three categories, namely, infrastructure, civil service, and communication. The infrastructure and spatial planning policies of the apartheid era remain functional in South African cities today, reinforcing discriminatory patterns of service delivery. This study also found the installation of water management devices and punitive water tariffs to be structural causes of water inequality. Moreover, when these limited resources require maintenance, there is no sense of urgency on the city's part because historically, township dwellers were not regarded as worthy of benefiting from state provisions. The civil service plays a significant role in fostering water inequality.

By treating water as an economic good, the city prioritizes paying customers, thus marginalising those who cannot afford to pay for water. Additionally, while this study finds, service delivery in Khayelitsha is not as swift and thorough as it is in Rondebosch, there are disparities even within Khayelitsha; for example, Litha Park receives better services than Endlovini. Lastly, the city's overbearing, overly authoritative language when speaking to and about residents in informal settlements excludes them from the debate on water inequality and frames them as illegitimate residents, because the city has classified them in terms of illiteracy,

illegality and informality, simply because of where they are located. As such, the water-saving campaigns' print materials were deliberately not distributed in the informal settlements, and consultative processes to come up with strategy excluded the residents of Khayelitsha.

The physical arrangement of the City of Cape Town follows apartheid spatial planning which means that water supply infrastructure in informal settlements was poorly planned with no accommodation made for maintenance and upkeep. This is a common feature amongst South African cities, where the majority of the population is left without water resources because of their historic placement in townships. Moreover, when these limited resources require maintenance, there is no sense of urgency on the city's part because historically, township dwellers were not regarded as worthy of benefiting from state provisions. This study found these patterns in informal settlements as well where the lack of service delivery is more pronounced, due to the settlements being in worse conditions than the more formal sections of townships. The study found that the emergence of informal settlements in the City of Cape Town remains a political issue, as water service delivery in the city is still discriminatory, with informal settlements being treated with the same disregard with which the apartheid government treated areas populated by black and coloured people.

This study echoes the findings of numerous researchers in the water inequality discourse in South Africa, who found that the installation of water management devices and the implementation of punitive tariffs to discourage excessive water use during the crisis further marginalized the residents of Khayelitsha and prevented them from freely accessing clean safe water. Water management devices are a highly contested instrument of South Africa's water policy and each city has discretion on the installation thereof. In the case of Cape Town, the city cited water wastage as the reason for not installing these devices; and yet the first areas that were targeted during the crisis were lower income areas where the city repeatedly stated that the lowest volumes of water were delivered. Water management devices were found to have neglected the area-specific context and targeted poorer communities with the same household usage conventions that exist in affluent areas, making water expensive and even more difficult for the average household to access.

The City of Cape Town treats water as an economic good. As such, water service delivery is geared towards cost-recovery and prioritizes the paying customers over the residents who cannot afford to pay for water. Although FBWP insures water provision for all, it is not always possible to provide adequate water for all the households who are poor but do not sufficiently

meet the criteria to be regarded as indigent. This is the position many lower income households find themselves in where the cost of water is still too high, despite them being able to generate some form of income.

This study found that the residents of Endlovini were not met with the same prompt response to water-related queries and complaints as their Litha Park counterparts, but both were still far worse-off than the residents living in the Southern Suburbs. Drawing from the experiences of residents who lived in Litha Park and worked in Rondebosch, it became clear that the city does not prioritize complaints logged in Khayelitsha but similar issues when reported in the Southern Suburbs were responded to with care and urgency. There was also the issue of maintenance where the infrastructure in the Southern Suburbs was well-maintained, while most of the infrastructure in Khayelitsha had been there since the settlement was founded. In Endlovini, residents corroborated this by stating that the communal taps they have been using were first installed in 2000 and have not been replaced or upgraded since then.

This study found communication to be a significant driver of inequality in both the accessing and consumption of water across the city. The use of exclusionary language and labelling when referring to informal settlements exceeds the bounds of policy and is an integral part of the social dynamics that exist between the residents in the formalized sections of townships, compared with those in informal settlements. Furthermore, the way in which the city addresses people in informal settlements removes them from the important decision-making processes by classifying them as illiterate and illegal simply because of where they reside. This study found that the city's Water and Sanitation Department ran no campaigns in Khayelitsha to educate the communities on how to save water despite a "citywide" water-saving campaign being highly visible in all the affluent and prominent areas such as the Southern and Northern Suburbs, the City Centre, and the Atlantic Seaboard. As such, the water-saving campaigns' print materials were not distributed effectively in the informal settlements, and consultative processes to come up with strategy excluded the residents of Khayelitsha.

7.2 Conclusion

This research posits itself on the intersections of spatial planning and access to water services to highlight the water inequality that is created by apartheid spatial planning and maintained by the City of Cape Town's disregard for residents in informal settlements because of their informal status. The study argues that we need to redirect our focus to the nuances that make

the townships a difficult place to implement effective water management systems by taking into account not only the spatial inequalities that exist, but also the dynamics that dictate social life in townships and how these are a product of disregard by the local government.

This argument was presented through a critique of John Rawls' theory of justice, which called for inequality as long as it titled the scale sufficiently to benefit those who would otherwise be worse-off. The application of Rawls' *Difference Principle* of justice to the study area calls for a rethinking of the city's approach to water governance and distribution, such that the poorest communities can be prioritized when provision is made to allocate adequate water as mandated by the FWBP, before the businesses and affluent areas are given the opportunity to purchase additional water. In the likely event of a drought, there should be deliberate efforts to ensure that all residents receive adequate water before excessive consumers are allowed to use more water.

Fulfilment of the *Fair Equality of Opportunity Principle* can be achieved if the residents are fully and justly represented in policymaking structures and processes, without political and socio-economic hierarchies that prevent poor residents from participating. Crucial conversations about the city's present and future supply of water need to be opened up to those negatively affected by the outcomes of these discussions, to allow for context-specific adaptation efforts. This study concurred with Enqvist and Ziervogel (2019), Ouweneel *et al.* (2020) that water shortages in the City of Cape Town are to be expected more frequently in the future, and as such, policy around how to cope with water stresses must be representative of the complete demographics of the city.

This study recognises a rights-based approach to water services particularly in poor areas as the most efficient and viable approach in overcoming water inequality and supplying free water to communities that cannot pay for it. This goes beyond making water available for free but also involves making an effort to protect other human rights tied to water. This means that households that qualify for free water services should be implicitly eligible for free sanitation services. A rights-based approach places people over profits, and as a service delivery strategy invites participation from all sectors to rethink ways of securing the funding to cover the cost of water services delivery without compromising the quality and quantity of water poor communities have access to.

This study concludes that water inequality in Cape Town is propagated by service delivery that follows apartheid-framed definitions of residential areas, effectively disregarding the residents in informal settlements and subjecting those in the formal sections of the township to water management devices that make water expensive for most households. This inequality in access and consumption of water is maintained by the lack of commitment from the local government to develop water governance policies that ensure that people who live in informal settlements are receiving adequate water, which all citizens of South Africa are entitled to. These two factors were especially detrimental during the water crisis of 2015-2018 when the city's responses further worsened the inequality. These findings are consistent with other researchers' contributions to the field of water and water governance debates in South African townships. The impact of the study on these debates is the introduction of a localized approach to research which considers the nuances between the different types of settlements within a township, by focusing the study on the inequality between informal settlements and formalized sections of the township.

7.2.1 The contribution of the study

This study places the lived experiences of the residents of Khayelitsha at the centre of the water inequality debate, by identifying the extent to which their location in the city informs water service delivery. There is inequality in access to water between informal settlements and formal sections of Khayelitsha and this is directly linked to apartheid spatial planning. The residents of Khayelitsha experience poor water service delivery, in comparison to residents in other parts of the city. However, the available literature in this regard treats Khayelitsha as a monolith and dismisses the layered and diverse ways of life in an informal settlement, essentially comparing a *township* to a *suburb*. As this study highlights, Litha Park is still better off in comparison to Endlovini, despite them both being within Khayelitsha, and that internal inequality is what makes the difference in how people in different parts of the township experience water and sanitation services. There are obvious disparities in the way that the local municipality responds and reacts to the complaints lodged by the residents of Endlovini, where the challenge of access to clean drinking water already exists. This inequality often comes across as a class problem, since the residents in Endlovini do not pay for water, but it is rooted in deeper notions of legal residency and belonging.

Another contribution this study makes to the water inequality discourse is the identifying of the roles played by each of the actors involved. Water inequality in informal settlements is

perpetuated by the local government, but the general community plays a role in maintaining this inequality. The residents of Litha Park referred to Endlovini as "the settlements/informal settlements" and found it appropriate to use other areas like Endlovini as their reference, when they were asked if they thought the water infrastructure and quality in their neighbourhoods was better than anywhere else in the city. This awareness of the difference in treatment from the municipality allows people who live in formalised sections to speak about their neighbours in informal settlements in terms of illegality and insinuate they are less legitimate as residents because they do not pay for water and other services.

This works to the detriment of Endlovini residents in two ways, as the people who live in Endlovini also view themselves in the same light. Residents in Endlovini do not feel entitled to complain about poor water services because they see themselves as undeserving of state provisions. This study delves into these attitudes and perceptions, picking up on cues from the way people use words to establish themselves on the social hierarchy. Employees of the city refer to the people in Litha Park as "the community" in contrast to the way they respond to the water needs of paying customers.

7.2.2 Future research

Backyarders are often overlooked in water inequality discourses, despite the fact that they have a direct impact on water costs for the homeowners. The FWBP allocates one meter per stand, but homeowners who accommodate backyarders have to share this allocation amongst multiple households on the same stand. The financial implications on the registered stand owner are also felt by their tenants so they then have to charge the backyarders exaggerated rental rates to make up for the high-water bills. There are financial implications for residents in any policy changes made. A pressing question that arose out of the research process, especially fieldwork, was why there was no research that focused on water inequalities faced by backyarders, and how they were affected during the water crisis. Backyarders in Khayelitsha are not accommodated or accounted for when the city comes up with their annual water budget. This is an area of further study that can be explored to better inform water governance policies in the City of Cape Town. This will also mean filling the knowledge gap on the effects of national policies on intra-township studies concerning informal settlements, that may not have been formed at the time the policies were initially implemented.

7.3 Recommendations

This study recommends short-term and long-term interventions that can be implemented to remedy the problem of water inequality in Khayelitsha. Advocacy, reinforcement of technical expertise, and financial and material resources are areas that can be explored to mitigate the physical processes that cause fluctuations in the availability of water. It is important to ensure that all households have access to safe clean water at all times. However, it is equally as important to educate the residents on what exactly constitutes a water crisis so that saving water becomes a necessary requirement for everyone. As Kongo (2019) found, many residents did not feel compelled to save water because their taps never ran dry, because the concept of water scarcity was not explained and taught to them. This requires rigorous advocacy and education at all levels of society, especially in areas where residents do not have the incentive to save water because they are not affected by water shortages. While the Department of Water and Sanitation should take the lead on these short-term interventions, other stakeholders including community leaders and NGOs are already participating in these types of initiatives in the community.

Long-term interventions spearheaded by local government, national government and the international community are in line with the SDGs, particularly SDG 6 and 11, which will contribute to water-secure, sustainable cities that meet the Sustainable Agenda. The need for reimagination of post-apartheid South African cities, using postcolonial frameworks of development has been proposed by scholars of decoloniality, with the emphasis being on the need to dismantle systemic racism in South African cities. However, this proposal has always been ideological. This study recommends a deconstruction of the current models of the flow of water from the Western Cape Water Supply System (WCWSS) into the City of Cape Town, which is inherently colonial and apartheid-influenced, to equitably redirect distribution of water to all parts of the city. This will require political commitment, especially from the local government, and it will mean that water service delivery will no longer merely be a tool of electioneering but rather an exercise of protecting a constitutional right.

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Appendices

i. Consent Sheet

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Introduction

I am Amanda Mokoena, a Student/Researcher in the African Studies Unit of the University of Cape Town, South Africa. I am conducting research on issues related to water inequality in Khayelitsha, and I would like to ask some questions on these issues.

Purpose of Study

[Explain to the **INTERVIEWEE** the **PURPOSE OF THE STUDY** and **HOW THE INFORMATION COLLECTED WILL BE USED]**

Duration and Content of Interview

- This interview will take approximately **20 minutes,** I will ask a number of questions about the topic of my study.

Confidentiality

- All the information gathered during this interview is confidential and will be solely used for the intended purposes of this study. I will not reveal to anyone your name or any form of your identity without your permission.

Voluntary Participation

- I will conduct this interview with the understanding that you have freely accepted to take part in this study, and that you are not under any obligation to answer the questions that I will be asking. You are free to discontinue the interview at any time.

Benefits

- There are no direct personal benefits that you will get by participating in this study. However, the study will enhance our knowledge on the subject and the findings may be used by the community to engage with policies and programmes that are relevant to the community.

Information about Study

- Feel free at any time to ask questions to clarify anything related to this interview or study.

Consent

I freely consent to take part in this study. I understand that I am participating freely and without being forced in any way to do so. I also understand that I can stop participating at any point should I not wish to continue. I also confirm that the purpose of the study has been fully explained to me. I understand that this is a research project whose purpose

is not necessarily to benefit me personally in the immediate or short term. I also understand that my participation will remain confidential.

Signature of Interviewee……………………………………………… Date: …………………………………………………………

–

ii. Appendix 2: Interview Questions (Litha Park and Endlovini)

Categories of inequality

Infrastructure

- How close is the nearest source of fresh water to your home?
- What level of access do you have to piped water?
- Are there any obstructions and/or physical barriers that hinder your access to water?
- Who has access to street taps and is this access monitored?

Quality of water

- Where do you get drinking water from?
- Do you trust the quality of the water that comes out of your tap?
- What do you think clean and safe water should look and smell like?
- Do you drink the water straight from the source?
- How consistent is your supply of water?

Response from municipality

- What have you seen being done to maintain the taps, pipes, and reservoirs in your area?
- How often does the municipality service water pipes?
- When last did you see any water services infrastructure being serviced?
- Who do you contact when there is a leaking tap or a burst pipe?

Attitudes and perceptions

- How do municipality workers treat you when you report any problems with the water?
- How different is the service you experience from other residents you have spoken to?

Dimensions of inequality

Historical

- How long have you lived in your current home for?
- Where were you born?
- Have you always lived in Khayelitsha (since living in Cape Town)?
- How would you compare your access to water in Khayelitsha to anywhere else in the City of Cape Town you have ever worked or lived?

- How has your access to water changed since you moved to your current area?
- How has the quality of water changed in the time that you have lived in your current home?
- What changes have you observed since 1994?

Spatial

- How does flooding and/or blocked/burst pipes affect your everyday life?
- Do you have sewerage services?
- How do you think the presence/lack of a good sewerage system affects water quality?

Geographic

- What natural objects/features affect your access to water and in what way?

Scarcity

- In the event of water cuts, what precautionary steps do you take to ensure you have water for your household?
- Is there a way of knowing in advance when there are going to be water cuts?
- What is the longest period you have ever gone without clean water supply?
- Why do you think water supply is sometimes stopped?
- What do you understand by “water crisis”?
- What do you think the words “Day Zero” mean?

Questions on income

- How do you think your level of income affects your access to service delivery?
- How much water do you think you would have access to if you got billed for water?
- What are your most basic needs and how much water do you think they consume?

A. OBSERVATION

- All factors hindering water delivery entirely because of the area the settlement is in.
- The physical arrangement of the communities (looking for disparities).
- The people’s experience with municipality officials and how it has shaped their interactions and delivery of water services.
- The people’s understanding of the water crisis, and relationship with water.

B. PARTICIPANTS (10 in total)

- Two primary respondents
- Other community members (4 from each side)
- Appendix 2: Interview Questions (Litha Park and Endlovini)

iii. Appendix 3: Interview Questions (Department of Water and Sanitation)

1. What is the official definition of Informal Settlements?
2. How are the different areas serviced? Is there a different protocol for informal settlements and backyarders?
3. How does the City keep track of the numbers of taps in each settlement?

- What is done about “illegal” installations?

4. How often is there routine infrastructure serviced/maintenance?
5. How are complaints lodged and what is the most popular method residents of Endlovini, and Litha Park use?

- On average, how many complaints are lodged per month per area?
- How often do the complaints require immediate attention?
- What is the most common problem residents report?
- Of the two areas, where is the most maintenance required and how often?

6. How do the residents interact with city officials when they attend to maintenance or complaints?
7. What problems do you encounter while attending to repairs and maintenance? Are there factors that affect your ability to provide operational services?
8. What is the department’s role and responsibility in raising awareness about using water sparingly? How is this implemented?