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Faculty of Humanities
Fakulteit Geesteswetenskappe
Lefapha la Bomotho

Department of Anthropology and Archaeology

COVID-19 AND WATER DELIVERY CHALLENGES IN THE RURAL SOCIETY OF DRIEKOPPIES IN MPUMALANGA.

by

CAROLINE CASSANDRA KENALEMANG SEITSHIRO

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DECLARATION

I declare that the dissertation / thesis, which I hereby submit for the degree: Master of Social Science in Development Studies at the University of Pretoria, is my own work and has not previously been submitted by me for a degree at this or any other tertiary institution.

ETHICS STATEMENT

The author, whose name appears on the title page of this dissertation / thesis, has obtained, for the research described in this work, the applicable research ethics approval.

The author declares that s/he has observed the ethical standards required in terms of the University of Pretoria's Code of Ethics for Researchers and the Policy guidelines for responsible research.

CCK SEITSHIRO

Caroline Cassandra Kenalemang Seitshiro

November 2024

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DEDICATION

This thesis is dedicated to my mother, Sandra Seitshiro, for her unwavering love and support. Her belief in my potential fuelled my determination to see this project through.

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ACRONYMS

ART	Antiretroviral Treatment
CMA	Catchment Agencies
CODESA	Convention for Democratic South Africa
COGTA	Cooperative Governance and Traditional Affairs
COVID-19	Coronavirus disease 2019
DEA	Department of Environmental Affairs
DWA	Department of Water Affairs
DWAF	Department of Water Affairs and Forestry
DWS	Department of Water and Sanitation
EPA	Environmental Protection Agency
HIV	Human Immunodeficiency Virus
IDP	Integrated Development Plan
IDASA	Institute for Democratic Alternative in South Africa
IFAD	International Foodservice Distributors Association
IFC	International Finance Corporation
IWRM	Integrated Water Resource Management
MFMA	Municipal Finance Management Act
MIIU	Municipal Infrastructure Investment Unit
MSA	Municipal Systems Act
MSP	Municipal Services Partnership
NGO	Non-Governmental Organisation
NICD	National Institute for Communicable Diseases
NPM	New Public Management
NWA	National Water Act
OECD	Organization for Economic Co-operation and Development
PPP	Public-Private Partnership
RDP	Reconstruction Development Plan
RSA	Republic of South Africa
SAICE	South African Institution of Civil Engineering
SDG	Sustainable Development Goals
SFWS	Strategic Framework for Water Services

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STATSSA	Statistics South Africa
TB	Tuberculosis
TIPS	Trade and Industrial Policy Strategies
UN	United Nations
UNDP	United Nations Development Programme
WHO	World Health Organization
WRG	Water Resource Group
WSA	Water Service Act
WWTW	Wastewater Treatment Works

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ABSTRACT

Rural areas face greater challenges regarding water supply and sanitation because of the settlements' predominately environmentally vulnerable locations, diverse cultural development models, precarious economic conditions, and associated difficulties with cost recovery. Dispersed settlements, an agro-based economy, and scarce water supplies frequently hamper infrastructure provision. This study aims to explore water delivery challenges in the rural society of Driekoppies during the COVID-19 pandemic, helping inform future water provision efforts during pandemics. Guided by an epistemological position, the study is designed as a single-site and an in-depth inquiry grounded on people's lived realities and experiences. The methodology adopted for the dissertation was a qualitative research approach. Data was collected from the Driekoppies community in Khomanzi District in Mpumalanga using interviews, observation, and secondary data. It used purposive sampling for the four key informants who participated in the study such as an official from the Department of Water Affairs, the head of water and sanitation, an official from the water demand section and the last official was from the water quality section, whilst twelve participants from the study area were used to collect data. Out of the twelve participants, four were male while eight were female.

The study found that water shortages in Driekoppies are because of ‘construction mafias’, which are groups that disrupt water projects by demanding jobs or fees that delay progress and leave infrastructure incomplete. Additionally, water challenges in the community result from ageing water infrastructure and climate change phenomena causing frequent draughts. To address these challenges during the COVID-19 pandemic, the government of South Africa came up with intervention strategies such as drilling boreholes and setting up water tanks that would be filled by water tankers for citizens to access water. However, some of the infrastructure that was set up was vandalised during the COVID-19 period. The research also found that households in Driekoppies view rainwater harvesting and providing informal settlements with water infrastructure as some of the sustainable solutions to the water challenges that they

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face. Churches, NGOs, and the private sector were some non-state actors who helped with water provision to the community of Driekoppies during the COVID-19 pandemic.

The study concludes that the water supply situation in Driekoppies is not just a concern, but a pressing issue that demands immediate attention. The current state of inadequate water supply for households in Driekoppies is far from ideal for curbing the devastating impact of COVID-19. The government of South Africa and its development partners should urgently work on a permanent solution to address the water challenges in the study area, as only a sustained effort can ensure a lasting impact. The study recommends that policymakers emphasise that municipalities form public-private partnership (PPP) arrangements which will help create synergy and share risks and rewards between the public and private sectors.

Keywords: COVID-19, Mpumalanga, rural society, water challenges, water delivery

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CHAPTER ONE: INTRODUCTION

1.1 INTRODUCTION

Water is critical for every societal development because it supports healthy ecosystems, drives economic growth, and is vital for our lives. The provision of clean water is a fundamental human right in South Africa and the country's supreme law supports it. Water provision is considered a fundamental human right because of the consequences of the imbalance of apartheid, and the government is devising appropriate ways of prioritising providing clean water to citizens as widely as possible. Besides water provision to citizens being a fundamental human right, provision of it in a fair and impartial manner is the main target of the United Nations' (UN) Sustainable Development Goal (SDG) 6 "Ensure availability and sustainable management of water and sanitation for all"; 6.1 and 6.2, respectively (UN, 2015; Bayu, Hyungjun & Taikan, 2020: 1).

According to Trade and Industrial Policy Strategies (TIPS) (2020), South Africa is one of the most unequal countries in the world, displaying the highest Gini and Palma ratios and this inequality is palpable in access to water and sanitation. Even though progress has been made in the last twenty years, the country is still dealing with the effects of apartheid. The coronavirus disease 2019 (COVID-19) pandemic shed light on the challenge of water and sanitation that the citizens face and the work that lies ahead for the government to fully achieve SDG 6. To combat the outbreak of COVID-19, strict hygiene measures such as washing hands and surfaces to prevent infection and the spread of the disease and well-resourced healthcare are critical. According to TIPS (2020), as of 2016, while 93% of households in South Africa had access to improved water sources, 43% had adequate access to water services (their access was good across all dimensions).

The lack of access to safe water in rural communities leads to numerous health issues. Inadequate availability of clean water contributes to the spread of various water-related diseases, including waterborne illnesses such as cholera, typhoid, shigellosis, amoebic dysentery, hepatitis A and different forms of diarrhoea. It also facilitates water-contact diseases like schistosomiasis (bilharzia) and guinea worm as well as

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vector-borne diseases associated with water habitats, such as malaria, lymphatic filariasis (LF), commonly known as elephantiasis, onchocerciasis (“river blindness”) and human African trypanosomiasis, also known as sleeping sickness. Additionally, poor water hygiene can result in conditions like scabies, trachoma, tinea (ringworm), pediculosis (lice), roundworm infections and even Ebola virus disease (EVD or Ebola) (García-Ávila, Guanoquiza-Suárez, Guzmán-Galarza, Cabello-Torres & Valdiviezo-Gonzales, 2023; Hutton & Chase, 2016). Furthermore, the COVID-19 pandemic, which claimed millions of lives worldwide has been linked in part to inadequate water, sanitation and hygiene practices (Bonful, Addo-Lartey, Aheto, Ganle, Sarfo, Aryeetey & DiGennaro, 2020; Ismaila, Baddianaah, Fielmua, Nandzo, Salifu & Abdulai, 2023). Rosa and Clasen (2010) estimate that unsafe water consumption and poor sanitation contribute to 10% of the global disease burden.

South Africa's battle against COVID-19 was compounded by the country's water scarcity. According to the World Economic Forum (WEF) (2009), a 17% water deficit without intervention from the state and other stakeholders is projected by 2030. Currently, 19% of the rural population does not have reliable water supply (Igamba, 2022). Recurring and prolonged droughts are already affecting communities and water sources, particularly in the Eastern and Western Cape provinces. Water and sanitation provision for everyone and the assurance of water security will necessitate significant expansions to the water supply systems. The country's water and sanitation infrastructure is in a state of disrepair with numerous water treatment plants, wastewater treatment works (WWTWs) and distribution and conveyance networks requiring substantial refurbishments to meet the growing demand and the need for increased coverage (SAICE, 2017).

The government operates at three levels of governance - national, provincial and local - to assist citizens with essential services that are important in their day-to-day needs. The local level was established as a decentralisation strategy, bringing the government closer to citizens and enabling swift service delivery (Siddle & Koelble, 2016). The local level is further divided into metropolitan, district and local municipalities, each with its own different approach on how to meet citizens’ demands and expectations (RSA, 1998a).

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This chapter sets the stage for the study. The first section establishes the background and motivation of the study, providing the context for the research problem. This is followed by a detailed description of the study's objectives and the key questions that will guide the dissertation. The chapter then underscores the significance of the study and outlines the structure of the dissertation, highlighting the importance of each section in contributing to our understanding of the water crisis in South Africa.

1.2 BACKGROUND AND CONTEXT OF STUDY

The World Health Organization (WHO) Director-General declared the novel coronavirus outbreak a public health emergency on 30 January 2020 (WHO, 2020b). The novel virus was spreading across different regions worldwide, and all countries were supposed to implement evidence-based and consistent decisions to help fight the outbreak. The novel coronavirus, - a “severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2)” – was the name of the new virus up to 11 February 2020. This name was chosen because the virus is genetically related to the coronavirus responsible for the SARS outbreak of 2003. While related, the two viruses are different. The WHO announced ‘COVID-19’ as the name of this new disease on 11 February 2020. This was initially picked as a 'viral pneumonia' case in Wuhan, People's Republic of China (WHO, 2020a). According to Cooley and Linn (2020), the COVID-19 impact was not only on health but also on education, employment, and the economy, which would lead to crises of hunger and poverty and, in some countries, governance and political instability crisis. The impact of the COVID-19 infections was different depending on whether a country was a low-, middle-, or high-income country. In underdeveloped countries, with larger populations at risk, lack of funds, fewer resources, and less capacity, there was pressure to develop innovative initiatives and test people quickly to combat the virus.

The National Institute for Communicable Diseases (NICD) in South Africa gave the initial warning of the novel coronavirus in January 2020, while the first case of COVID-19 infection was confirmed on 5 March 2020 (NICD, 2020b). After this, President Cyril Ramaphosa declared a national disaster in terms of the Disaster Management Act No. 57 of 2002 (RSA, 2002) on 15 March 2020 to intensify the fight against the spread of

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COVID-19. After the declaration, several rules, regulations, and directions guiding various sectors such as transport, immigration, business, provincial governments, and local governments were enforced.

The South African local and provincial government response to control COVID-19 from spreading was formed on 25 March 2020, and it is known as the Municipalities and Provincial Directions in terms of section 27(2) of the Disaster Management Act, 2002 (COGTA, 2020). These directions were issued by the Minister of Cooperative Governance and Traditional Affairs (COGTA, 2020). These directions and amendments were given in line with water and sanitation provision, waste management, cleansing, and sanitation, amongst other things.

The fight against COVID-19 in rural municipalities and provinces in South Africa is limited and unsatisfactory because of the lack of essential resources during a pandemic of this magnitude. The essential and limited resources include a lack of funds, inadequate human resources and limited access to clean water and proper sanitation. While the impact of the limited resources in urban areas is not too severe, the same cannot be said in places like villages or squatter camps, where the consequences could be dire. Access to water and sanitation is an essential intervention in the fight against COVID-19. President Cyril Ramaphosa called for communities to follow good hygienic practices to combat the spread and effects of the deadly virus. In one of his addresses to the nation regarding the escalation of measures to combat COVID-19, he encouraged "everyone to wash hands frequently with hand sanitisers or soap and water for at least 20 seconds" (RSA, 2020b). Nevertheless, one of the biggest challenges facing people living in informal settlements, black townships, and rural areas has always been the lack of adequate access to water and proper sanitation amid the COVID-19 pandemic. Hara, Ncube and Sibanda (2020) argue that the first 21-day national lockdown that was announced and came into effect to curb the spread of the virus showed that the lockdown worsened the already existing inequalities in access to water and sanitation in rural areas, townships and informal settlements.

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1.3 STUDY OBJECTIVES

The study's primary objective was to assess the measures taken by the government to provide sustainable water provision and access in the rural society of Driekoppies in the Mpumalanga province during the COVID-19 pandemic.

Specific objectives:

1. To understand the government's challenges in providing water to the rural society of Driekoppies.
2. To analyse the various measures undertaken by the government to ensure the Driekoppies community's access to water as a response to the COVID-19 outbreak.
3. To investigate whether the government has developed sustainable water provision and access solutions in Driekoppies.
4. To investigate the role of non-state actors in the provision of water in the rural society of Driekoppies.

1.4 KEY QUESTIONS

The study sought to achieve these objectives by answering one central question: What sustainable water provision and access solutions were developed by the government in the rural society of Driekoppies in the Mpumalanga province following challenges associated with COVID-19?

This central question was further divided into more specific questions focusing on specific thematic areas.

Sub-questions:

1. What were the challenges faced by the government in providing water to the rural society of Driekoppies before the COVID-19 pandemic?

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2. What measures were adopted by the government to ensure water provision and access for the society of Driekoppies as a response to the COVID-19 outbreak?
3. How sustainable were the measures adopted by the government to ensure water access to Driekoppies? What does Driekoppies society view as a sustainable solution to their water problems?
4. Did non-state actors play any role in ensuring water access to Driekoppies in the context of challenges faced by the government?

1.5 SIGNIFICANCE OF THE STUDY

The study will help to explain the context of rural communities' water provision challenges in post-apartheid South Africa and to improve our understanding of state failure to provide essential services in rural societies. It also highlights the inequality in access to services in South African society and the vulnerability of specific sectors to COVID-19. While these challenges have a long pedigree, they were exposed after the spread of COVID-19. After the exposure, measures were implemented for these communities to access water which was a critical resource to fight the spread of the COVID-19 pandemic. However, the measures were still short-term and temporary. These communities require sustainable solutions, and the study seeks to understand people's views on what they believe to be sustainable solutions. In this respect, it carries significant lessons for local government and other non-state actors interested in improving conditions in rural areas. The provision of sustainable water solutions is critical for these societies in mitigating the spread of COVID-19 and living decent lives.

1.6 LAYOUT OF THE DISSERTATION

This study has five chapters. Chapter 1 introduce the dissertation by providing the study's background and motivation. It also covers the research objectives, questions and significance of the study. Chapter 2 defines concepts that are important and anchor this dissertation. Literature relevant to the study is also reviewed which include the theoretical and conceptual framework.

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Chapter 3 provides the research methodology, reasons for the choice of approach and the method used to conduct the research. It also provides information about the instruments for data collection used to collect both primary and secondary data.

Chapter 4 presents the research data findings. The findings are presented under themes based on the research questions.

Chapter 5 summarises the findings and discusses the broader implications of the research. It provides the conclusion and recommendations based on the findings of the study. This chapter will propose future research directions.

1.7 CHAPTER SUMMARY

This chapter gave a summary of the investigation and dissertation. It began with a background and context of the study's purpose and significance. In addition, the study objectives, research questions and the layout of the dissertation is provided. In the next chapter, a comprehensive literature study explores issues of water delivery challenges and theoretical framework.

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CHAPTER TWO: LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.1 INTRODUCTION

Governments worldwide are working hard to provide service to citizens in this era of governance. However, this is no longer their sole mandate. Other role players, such as non-governmental organisations (NGOs) and the private sector have been brought in to contribute to service delivery, and South Africa is not an exception. The Department of Water and Sanitation is mandated to provide water to citizens and is also the country's water resources custodian.

The first section of the chapter covers the definition of concepts. The following section discusses global perspectives on service delivery, followed by a discussion on the context of service delivery challenges in South Africa. An overview of the South African water sector is outlined. This is then followed by a section on the theoretical framework and an outline of statutory and regulatory frameworks guiding water service delivery in South Africa. The chapter then discusses the various non-state actors in the water service delivery sector and ends with the study's conceptual framework.

2.2 DEFINITION OF CONCEPTS

For the purpose of the study, the following concepts need to be clarified: service delivery, rural societies, local government, and the COVID-19 pandemic.

2.2.1 Service delivery

Service delivery refers to the provision of basic quality services and goods classified as tangible public goods and intangible services (Beyers, 2016 in Shongwe & Meyer, 2023). Effective service delivery means setting up strategies and plans that will be implemented by a government institution like a municipality (Sefala, 2009). Service delivery can be effectively addressed if accountability and ethical leadership are the driving forces for public officials (Mbandlwa, 2018).

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2.2.2 Rural societies

"Rural generally refers to areas of open country and small settlements, but the definition of rural areas in both policy-oriented and scholarly literature are terms often taken for granted or left undefined in the process of definition that is often fraught with difficulties" (IFAD, 2010). However, rural societies in South Africa have been a significant research topic because of the country's diverse terrain and historical influences. With a significant portion of the population residing in rural areas, South Africa's socio-economic landscape is uniquely complex, blending urban and rural environments. Experts like Hall and Bayliss (2017) emphasise understanding of the distinctive characteristics of rural communities, which often face challenges related to poverty, limited access to resources, and specific socio-cultural dynamics.

2.2.3 Local government

According to Maserumule (2011), local government is a democratic and autonomous sphere of government. This sphere of government is responsible for providing citizens with essential quality services because it is the arm of the government institution closest to citizens. According to the Organization for Economic Cooperation and Development (OECD), local government is based on fiscal governance and legislative and executive authority over an area corresponding to the territorial limit and a particular group of people.

2.2.4 COVID-19

According to the World Health Organization (WHO), coronavirus disease 2019 (COVID-19) is caused by the SARS-CoV-2 virus and it is an infectious disease. Coronaviruses are a group of viruses belonging to the *Coronaviridae* family, infecting both animals and humans. Human coronaviruses can cause mild diseases, similar to a common cold, while others cause more severe diseases (such as MERS - Middle East respiratory syndrome and SARS - Severe acute respiratory syndrome).

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2.3 GLOBAL PERSPECTIVES ON SERVICE DELIVERY

Reforms in the public sector which seek to enhance service delivery, have garnered significant attention over the past decade. According to PricewaterhouseCoopers (PwC) (2019), global trends such as escalating customer expectations, budgetary constraints, global competition for investment, public sector reform programmes and changing demographics have reshaped the public sector's landscape. This transformation has not only dismantled old barriers but also ushered in new opportunities. At the core of the push for superior public services are the heightened expectations of citizens - expectations that transcend economic status, geographies, and the different methods of funding, managing and delivering these services (PwC, n.d.; Mabizela & Matsiliza, 2020).

Because of high expectations, the public sector is now required to redefine its role, focus more on customers and build integrated service delivery models. The key to realising the desired benefits lies in these models' ability to efficiently and effectively meet customer needs while making a customer-centric approach the cornerstone of these reforms (Mbandla, 2018.).

PwC, (n.d.) highlight that there are numerous initiatives already in progress that illustrate how, under the right conditions, effective public service delivery models can be crafted by blending the complementary capabilities and cultures of the public and private sectors. Technology, as a key enabler, plays a crucial role in this process. The development of customer-centric models necessitates customer insight, a holistic view of customers' wants and needs (both demographic and attitudinal), a clear distinction between means and ends, a focus on enhancing customer journeys and measurable benefits and an understanding of the strategic risks associated with various service delivery models (PwC, n.d.).

Kanyane (2010) argues that almost all public and private sector organisations have hierarchical structures. Within these structures, independent vertical units (or 'silos') are a common feature necessary for administrative purposes. The transition from agency silos to a connected government does not necessarily imply a complete government restructuring. However, it does call for the alignment of a shared

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customer-centric vision with objectives, outcomes, information, and process flows. In different organisations, critical factors involved in the drive to build a connected government will include:

- building visible leadership at a strategic level,
- setting common goals (service standards) for connected government,
- focusing on the front end (where services are delivered),
- breaking down intra-agency silos before moving to dismantle interagency silos and putting in place an enabling policy and legal framework (PwC, n.d.).

Many countries have undertaken public sector reforms to improve the quality of public service delivery. While the demand for better services is common, the expectation spectrum varies from country to country. Several countries have undertaken significant reforms in their public sectors to improve efficiency, accountability, and service delivery. For instance, New Zealand has been a leader in public sector reform, adopting New Public Management (NPM) principles in the 1980s, which emphasised performance-based accountability, decentralisation, and greater autonomy for public agencies. They restructured the sector to focus on outcomes, introduced clearer lines of responsibility, and promoted competition within public services, leading to more efficient public administration. Similarly, Singapore has successfully reformed its public sector through a focus on meritocracy, efficiency, and the professional development of civil servants. The country's Public Service Division emphasises leadership development and a results-oriented approach, ensuring that civil servants are well-trained to serve the nation's development goals. In Canada, reforms have focused on enhancing transparency and accountability with the introduction of performance measurement systems and citizen engagement to ensure that the government's services meet the needs of the population. South Korea also undertook substantial public sector reforms starting in the 1990s, where they streamlined bureaucratic processes, adopted e-governance, and improved service delivery, resulting in greater public satisfaction. These countries' reforms typically include a combination of decentralised decision-making, streamlined processes, improved transparency, and a focus on citizen satisfaction, all of which contribute to better governance and public service delivery.

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2.3.1 Contextualising service delivery challenges in South Africa

Local government is amongst the three governmental spheres, including the provincial and national governments, and is responsible for the local administration of public services. A local government sphere is autonomous and entitled to regulate matters relating to local affairs. Municipalities can make and enforce by-laws (Madue, 2016). Local governments, specifically municipalities, have roles and functions that differ entirely from those in the provincial and national spheres. However, the similarity between the three spheres of government is ensuring that services are delivered to the people without discrimination (Kanyane, 2010).

According to Mbandlwa (2018), providing quality essential services to the people should be at the forefront of local government to uplift the dignity of the poor and previously disadvantaged groups affected by the apartheid system. Many municipalities in the country are not performing well in terms of service delivery in their communities. Several challenges within local municipalities continue to hinder providing essential services to communities. For example, some municipalities struggle to create an adequate budget to address community service delivery issues. The failure of municipalities to draft budgets ensures that they find it hard to sustain themselves financially and operate effectively, inevitably rendering such municipalities failures and incompetent (Beyers, 2016 in Shongwe & Meyer, 2023).

According to the consolidated general report on local government audit outcomes (AGSA, 2020a), more than 70% of municipalities in the country are finding it challenging to manage their finances; hence, they also struggle to enhance the provision of essential services in the communities they serve (AGSA, 2020b). The 2020 Auditor-General's report outlines that one in five municipalities is on the verge of collapsing. The financial state of many municipalities is dire, to the extent that most of them would soon find it hard to operate correctly, which is a significant concern (AGSA, 2021). More than 70% of municipalities are struggling to operate satisfactorily, maintain the provision of essential services, and ensure that they consistently spend their allocated annual budget sustainably. When a local municipality cannot provide essential services to communities, residents' trust in the municipality diminishes, creating the conditions for violent service delivery protests (Kgobe, 2020).

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Mabizela and Matsiliza (2020) state that the responsibility of municipalities is to ensure the effective and efficient delivery of basic and essential services, such as water, electricity, housing, and proper sanitation, to communities. There is an uneven distribution of essential services between rural and urban areas, whereby urban areas enjoy better service than rural areas. Scholars have alluded to the capacity of municipalities, which is a prerequisite for service provision in local government. Nationwide, many municipalities lack adequate capacity to provide essential services to communities. The current state of local government in rural areas shows that most rural municipalities still have backlogs for essential service delivery.

The *White Paper on Local Government* of 1998 (RSA, 1998a) outlines the mandate for municipalities to effectively address service delivery concerns such as infrastructure development, the housing backlog, and many other services that citizens require. Disturbingly, most municipalities struggle to provide adequate services to ensure that there is a level of effectiveness and efficiency. Municipalities need help to conduct effective oversight, contributing to the growing concern about the lack of services in communities. Monitoring and evaluation systems are not adequately administered, contributing to a lack of accountability (Mabizela & Matsiliza, 2020).

Rural and township municipalities could deliver essential services to citizens more effectively. This is seen by widespread demonstrations and service delivery protests across rural and township municipalities as citizens no longer have confidence and trust in municipalities because they fail to ensure that essential services are delivered to communities (Siddle & Koelble, 2016). Mabizela and Matsiliza (2020) state that service delivery challenges result from several issues, including corruption, lack of capacity within municipalities, lack of effective oversight, and inadequate budget from the national and provincial governments provided to municipalities.

According to COGTA (2015, in Mabizela & Matsiliza, 2020), municipalities are experiencing various challenges that hinder service delivery, such as inadequate technical skills, knowledge, leadership, and management skills. Accordingly, public administrators and ward councillors must gain the necessary skills and knowledge to deliver community services (IDASA, 2010). Municipal administrators and ward

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councillors are closely linked to communities; they interact with community members to continually enhance. Local government authorities must devise strategies for acquiring human and financial resources to improve the lives of community members (Mabizela & Matsiliza, 2020).

A report by The Institute for Democratic Alternative in South Africa (IDASA) (2010) (in Mabizela & Matsiliza, 2020) concurs that municipalities are facing considerable challenges in financial mismanagement, corruption, and non-compliance with financial legislation for local government. The failure of most municipalities in the country to control their finances determines their success and failure to sustain themselves and provide services to communities. The lack of financial management primarily contributes to a great degree of failure in local economic development, infrastructure development, strategic growth, and service delivery.

2.3.2 COVID 19 and water challenges in rural communities

The lack of access to water in most rural communities during the COVID-19 pandemic has been attributed to several factors, including informal employment with unpredictable income, lack of legal land ownership and financial constraints that make it difficult to pay monthly bills. These challenges hinder institutions from extending water infrastructure to such areas (Boakye-Ansah, Schwartz & Zwarteveen, 2019). Additionally, rapid and unregulated urbanisation has put immense pressure on water resources, further limiting water availability (Owusu, Asumadu-Sarkodie & Ameyo, 2016). Similarly, limited water consumption and low investment attractiveness contribute to accessibility challenges in rural areas. High unemployment and poverty in these communities often lead to illegal water connections which drive up operational costs and reduce the efficiency of water supply services (Boakye-Ansah *et al.*, 2019; Fielmua & Mwingyine, 2018).

Water provision during the COVID-19 pandemic faced several challenges including inefficient infrastructure, unequal service distribution and inadequate water supply caused by faulty equipment which in some cases, leads to water rationing (Kangmennaang, Bisung & Elliott, 2020). Additionally, poor water management, a shortage of water treatment facilities, inadequate sanitation, increasing water demand

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and changes in land use all negatively impacted freshwater resources, reducing both domestic water supply and overall water availability. For instance, shifts in land ownership and usage further complicate water access. Moreover, there is limited information on the availability of improved water sources in both urban and rural areas (Desye, 2021).

2.4 OVERVIEW OF SOUTH AFRICAN WATER SECTOR

South Africa is a semi-arid, water-scarce country characterised by a climate that has either wet (mostly summer) or dry (winter) spells with droughts and floods. According to the Department of Environmental Affairs (DEA) (2011), South Africa is amongst the thirty driest countries in the world, with unpredictable rainfall and an average annual rainfall of 460mm, less than half that of the world average. Even rainfall results in high associated rainfall run-off, evaporation rates, and uneven water resources across the country. To further compound this, the country's human settlements followed historical pre-industrial economic activities, mainly agriculture and mining, which are not close to watercourses. Consequently, these significant urban and industrial developments constitute the most considerable water resource demand, which calls for large-scale water transfers across catchments through inter-basin transfer infrastructure.

To address all these challenges, the South African government has invested in water resources infrastructure such as dams with an estimated total storage capacity of 31 billion m^3 (Mwendera & Atyosi, 2018). A total of approximately 49 billion m^3 per annum, including 10% from Lesotho, is the annual run-off in the country. However, only a yield of about 14 billion m^3 per annum of this total surface run-off is available through dams, inter-basin transfer, and other water sources available in the country (Seetal, Mathye, Mahlangu & Godfrey, 2023). The country shares four international rivers, namely Orange, Limpopo, Inkomati, and Maputo rivers, with six other neighbouring countries, and a total of 45% of the country's river flow comes from these river basins (Department of Water and Sanitation (DWS), 2018). Because of international obligations and regulations governing water, the availability of water in South Africa is further constrained, which demands an approach to water management that enhances its use of the available resources. According to the DWS (2015) and GreenCape

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(2021), with its limited available water resources, the country uses 98% of its available water supply of about 15 billion m³ per annum.

The International Finance Corporation (IFC) (2019) estimates that the country consumes about 16 billion m³ per annum or about 237 litres per person per day, higher than the world average of 173 litres per day. The institution further asserts that much of this water comes from surface water (68%), 13% is groundwater, 13% is return flows, and 6% is desalination. Even though the water resources in the country are already under increasing pressure because of developmental and socio-economic transformational needs, the demand is expected to increase even further, exceeding the supply by 17% by 2030. The primary factors that are putting pressure on the availability and distribution of water resources are climate change issues, industrialisation, and environmental concerns such as the need to safeguard ecosystems and population growth (Mwendera & Atyosi, 2018).

The Environmental Protection Agency (EPA) (2012) states that the major sectors of the economy, such as agriculture, manufacturing, mining, energy production, and public water supply, are where direct water use is mainly concentrated. A large percentage of approximately 61% of total water requirements are for irrigation. At the same time, human settlements (municipal) and the industrial sector (mining, manufacturing, and energy) take about 27% and 7% of total water use, respectively (Seetal *et al.*, 2023). In the industrial sector, the highest use of water occurs in manufacturing, which is expected to grow by 2030. According to the DWS (2018), South Africa's Industrial Policy Action Plan (DTI, 2016) aimed to expand the manufacturing sector for national growth and development, particularly agro-processing. The National Development Plan (NPC, 2012) has also identified agro-processing and its sub-sectors as critical in developing the economy, leading to increased job opportunities and contributing to an inclusive rural economy. The agro-processing sector was viewed as a significant water user, with an approximate consumption of about 130 million m³ per year in 2019, divided between pulp and paper and food and beverage subsectors (IFC, 2019).

To reconcile future water demand and current water supply, the DWS has developed water resource reconciliation strategies for the large water supply systems and

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metropolitan areas and all the towns and villages in South Africa (Seetal *et al.*, 2023). Some interventions to improve water supply are water conservation and demand management, surface water infrastructure development, inter-basin transfer schemes, water effluent reuse, groundwater development, existing infrastructure improvement, and desalinating sea water (Seetal *et al.*, 2023). The DWS 2022 report shows that the water supply systems are operating at a shortfall of 96 m^3 per year (1%) nationally, and the prediction is that it will reach 3.4% by 2040. Other growth projections indicate that the water demand will keep rising in the agricultural sector by 0.5 million m^3, 1.3 million m^3 in the municipal sector, and 0.5 million m^3 in the industrial sector by the year 2030, in comparison to 2017 data (Seetal *et al.*, 2023). The increase in water consumption in the municipal sector is attributed to population growth and increased urbanisation, which means that more people have access to piped water (Donnenfeld, Crookes & Hedden, 2018).

Notwithstanding the above, and even though none of the projections and predictions are definitive, one thing to accept is that there will be a shortage of water resources in the near future when one looks at the various socio-economic and development scenarios being planned. As the pressure on water resources increases, the country's water security risk becomes higher.

2.5 THEORETICAL FRAMEWORK

Nations are created through philosophical studies such as Divine Correct Theory, Natural Right Theory, and Conflict Theory. Since 1994, South Africa has been a constitutionally sovereign nation, and the Constitution of the Republic of South Africa No. 108 of 1996 (RSA, 1996) (hereafter referred to as the Constitution) (RSA, 1996) is the supreme law of the land. The creation and promulgation of the Constitution was to address the inequality and oppression that had been happening during the apartheid era. In South Africa, the Constitution acts as the written social contract between the government and citizens (Loewe, Zintl & Houdret, 2020). The Social Contract Theory is central to this study.

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2.5.1 Definition of social contract

The OECD defines a social contract as a "dynamic agreement between state and society on their mutual roles and responsibilities." According to Cloutier, Harborne, Isser, Santos and Watts (2021), this definition considers negotiations between the state and citizens, social outcomes, and contract pliability of the contract. In addition, it means that the citizens and the state negotiate on issues of power and positions. Secondly, a social contract is about clear understanding on the agreement's obligations and tasks, which include a nation's policies, programmes, and laws, which reveal how assets will be allocated in communities. Thirdly, the definition concedes that the contract is not final but can be revisited.

According to Mulaudzi (2024), the term ‘social contract’ describes sets of state-society relations. It is the total of explicit or implicit agreements between the sovereign (government and any other actor with authority) and societal groups, defining their rights and obligations towards each other (Mulaudzi, 2024). In addition, balance in state-society and intra-societal relations are created by social contract as they strengthen social cohesion. Kitthananan, in Kennett (2008) and Karagiannis (2002) share that a social contract symbolises planned development within a society because multiple sectors come together, enabling creative partnership. The planned development process is a platform and instrument for service delivery, long-term economic growth, and production-oriented industrial development. The point of argument here is that for the process of development to take place, the state must give its support because development does not come through the private sector alone; it is possible through social compact and cooperation of different role players, as represented by government, civil society and the private sector (Kitthananan, in Kennett, 2008; Karagiannis, 2002). For that reason, the government's active role in developing social contracts is critical, as it has the power to bring all parties and partners responsible for water provision into a single Driekoppies vision.

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2.5.2 Background to social contract theory

Thomas Hobbes, the English philosopher, first proposed the Social Contract Theory in the 17th century. Hobbes pointed out that humankind was in conflict in its primordial and original state (*bellum omnium contra omnes*). The state of nature, better known as an original state (Neidleman, 2012), was portrayed as "nasty, brutish and short" (Moodley, 2017), with human reaction being that of hunting and gathering and, in the process, eliminating competition or anything that threatens survival. Hobbes believed that humans found this kind of approach unsustainable, and it was resolved by engaging into contracts with each other to control their relations (Neidleman, 2012). At the centre of the contract is the acknowledgment of a single leader who can legislate and control the lawlessness of the original state. In light of the above, Hobbes concluded that, as humans, our fear of what we could inflict on each other led to the creation of law and morality (Neidleman, 2012). The social contract is a means by which people take care of themselves and protect themselves from the state and vice versa to bring law and order as the end goal (Moodley, 2017).

The Social Contract Theory was reworked further by the 20th-century philosopher John Rawls in his book, *The Theory of Justice*, where he pointed out that humans seek social contracts to make life easier to navigate. The product of such an approach was morality. According to Rawls (1999), society results from communal arrangements or efforts to advance better conditions for everyone in society. He pointed out that the inequality that people are subjected to owing to their birth, natural resources, and even their history, is unfair. To a certain extent, Rawls advocates for an equal society, which is possible by addressing the elements that bring inequality into society. He further believes that core goods and services should be accessible to everyone, save where the inequitable distribution should be to the advantage of all (Moodley, 2017).

2.5.3 Social contracts in the real world

According to Loewe *et al*. (2020), social contracts are generally approached with uncertainty. They are considered critical when providing the necessary balance between governments, their subsidiaries, and society. It has been argued that social

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contracts constitute semi-informal entities that seek to make the interactions between the state and society more predictable and politics more stable. Social contract viability hinges on providing acceptable norms and rules for the government and other agents regarding their conduct. In reality, they do not entirely deal with conflicts in politics and other parts of society. However, they offer a lawful structure upon which conflict and subsequent interactions can be resolved in a non-violent and far more predictable manner.

For a social contract to be effective, it is predicated on three elements: 1) substance, 2) scope, and 3) temporal dimension. The substance looks at the deliverables exchanged between the government and society. This can be captured using a written contract where rights and obligations for both parties are provided, although to a lesser extent. For the substance to be made, boundaries to the relationship will have to be explained, and this can be performed through continuous interaction of the parties and the genuine fortitude of what behaviour will be accepted by either side (Loewe *et al*., 2020).

Loewe *et al*. (2020) state that there are three responsibilities that a government should fulfil when it comes to deliverables. These are:

1. protection of its citizens,
2. the provision of essential services to its citizens and
3. the participation of all citizens in political decision-making across all levels.

Fulfilling these obligations gives rise to what constitutes the nucleus of the functions of the state, which are authority, legitimacy, and capacity. Once a government can meet these core functions, it derives legitimacy from the eyes of the citizens, watchdogs, and other parties. It does not have to use underhand tactics such as repression to maintain power and control. When the government meets its mandate and fulfils its deliverables, society is expected to conform to the government's rules and be loyal to such rules. Society's obligation will be to accept being led through the rules that have been set up, which illustrates the critical part of the social contract - citizens' compliance. If there is a situation whereby citizens reject the performance rendered by the government, it means that they are rejecting that government, and in

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essence, the social contract collapses. The absence of such a contract means that the government will cease to exist (Loewe *et al*., 2020).

Generally, most societies comprise several groupings based on socioeconomic dimensions, historical practices, and political lines. Because of these several groupings, the social contract scope that is formed will be different, which means a government can enter into several social contracts to meet the expectations of the various groups. Governments perform this to address the varying levels of power between groups, ultimately leading to not every group being a direct participant in a social contract. On the contrary, strong groups can negotiate a contract that is mainly beneficial to them. Intrinsically, the scope of the social contract may cover all the parties to the contract or just a portion thereof; however, likely, those who will be at the forefront of such a contract will be the influential parties (Loewe *et al*., 2020).

In the real world, social contracts work differently from the ideals set out by Rawls (1999). Contrary to the thinking behind his thought experiment, social contracts depend on recognising the differences between persons and using those differences as the ground upon which the contractual relationship is developed. For instance, the provision of essential services as the substance of a social contract will be given according to the needs of the group instead of being based on a distribution policy that is not receptive to the issues being faced by the same but ostensibly all and diverse. Supplementary to this, this does not concur with Rawls' belief that the unfair allocation of essential goods and services is overlooked when it benefits everyone. In order to make this work, inequality must be understood, and strategies must be developed that will placate those disaffected by such practices.

An example of a COVID-19 social contract in South Africa was the ‘Social Solidarity Pact’ proposed by the government and civil society during the pandemic. This informal agreement emphasised mutual responsibility between the government, businesses and citizens to combat COVID-19 effectively. This social contract reflected a shared understanding that combatting the pandemic required cooperation at all levels of society, balancing rights and responsibilities for the collective good. However, challenges arose, including public resistance to lockdowns, vaccine hesitancy and economic hardships which tested the strength of this unwritten agreement.

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The social contract is, therefore, a working contract that must be adhered to. They depend on the environment in which they are made to operate - their aim and what a government has set out to achieve hinges on that country's advancement level and the challenges it faces. In reality, a social contract may fail to reach all deliverables reasonably; specific deliverables will be given priority over others. Therefore, social contracts are working documents predicated on a society's rights and a government's capacity to achieve and equitably do the same (Loewe *et al*., 2020).

2.5.4 The Constitution of the Republic of South Africa as a social contract

The Constitution (RSA, 1996) was crafted in response to South Africa's history of systemic racial oppression and rule, which was both unpredictable and arbitrary. The Constitution sought to be the mechanism that corrected the repressive state of nature that South Africans, particularly of colour, found themselves under during apartheid. It sought to undo the ill effects of institutionalised colonial influences and turn the tide on the abusive nature of a parliamentary sovereign system of governance (Davis, 2016). The Constitution is transformative because of its progressive stance and ability to shape the country into a just and equal society through constitutionally guided measures (RSA, 1996). As provided for by Karl Klare, a transformative constitution is an ongoing endeavour of enactment, interpretation, and enforcement within the context of the state of nature from which the Constitution has emerged. The aim of the transformation must be to correct the country's power relationships and social and political entities to achieve an egalitarian, participatory, and democratic equation. Klare also states that such a measure must be achieved through expansive social and non-violent political means anchored in law (Klare, 1998).

It may thereby be seen that the Constitution exists as the social contract between South Africans and a democratic government. The document carried across constitutional principles developed during the Multi-Party Negotiating Process (MPNP) to relieve South Africans from the oppressive state of nature in which they existed. It may further be argued that the MPNP and its predecessor, the Convention for a Democratic South Africa (CODESA) (SAHO, 2011), were the practical exercise of

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Rawls' *Thought Experiment*, albeit without a veil of ignorance, executed to determine what was required for a just and equal society. The preamble of the Constitution starts with the phrase, 'We, the People of South Africa…' which denotes the intention of inclusiveness and, importantly, the recognition of the will of the people, a concept propagated by Rousseau in his discussion of the Social Contract Theory (Adams, 2018). His desire for a social contract to be built on consensus was also provided for in the development of the Constitution, given that it was a consultative and participatory process whereby the Constitutional Assembly invited public commentary and feedback (Allen, 1999).

Constitutional democracy in South Africa is built upon four basic principles: constitutionalism, the rule of law, democracy and accountability, and the separation of powers (Currie & De Waal, 2014). These principles are essential as they carry the essence of the Social Contract Theory while providing the structure of a constitutional order. The overarching and first principle is that of constitutionalism. Constitutionalism refers to the theory of constitutional law in that it prescribes what constitutional law, and a constitution should achieve rather than simply describing those roles. The form of constitutionalism in South Africa states that the Constitution must structure and limit state power. In other words, the Constitution must provide the state with sufficient power to govern but simultaneously limit such power to prevent the violation of the law or the rights of citizens (RSA, 1996).

Constitutionalism, as practiced in South Africa, seeks to protect the interests of society by providing governance that is justifiably limited in its capacity to avoid arbitrary rule in any form. The Constitution engages the limitation principle to achieve this and operates in two ways. Firstly, the Constitution limits the range of powers awarded to organs of state, thereby restricting their level of competence. Secondly, it stipulates the procedures these state organs must follow within their range of competence (RSA, 1996). The effect of these measures is that specific state organs may only exercise certain forms of power and may only occur if specific processes are complied with. A relevant example of such limitation is regarding Chapter 2 of the Constitution, the Bill of Rights, in that the state not only bears the onus of upholding citizens' fundamental rights but must also avoid acting in a manner that could violate the same (RSA, 1996).

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The Constitution serves as a social contract by establishing the rights and responsibilities of both the government and the citizens, which became particularly evident during the COVID-19 pandemic. Rooted in principles of democracy, equality, and social justice, the Constitution justified government interventions such as lockdowns, curfews, and vaccine rollouts to protect the right to life (Section 11) and access to healthcare (Section 27). At the same time, it required balancing these measures with individual freedoms, such as movement (Section 21) and dignity (Section 10). Citizens, in turn, had a civic duty to comply with regulations like wearing masks and physical distancing to uphold public health. However, challenges arose, including legal disputes over lockdown policies, public resistance, and corruption scandals related to relief funds, which tested trust in the social contract. Ultimately, the pandemic underscored the Constitution's role in guiding governance and civic responsibility during crises, reinforcing the need for cooperation, transparency, and accountability.

2.6 WATER DELIVERY DURING THE COVID-19 PANDEMIC AND STATUTORY FRAMEWORK GUIDING THE PROVISION OF WATER SERVICES IN SOUTH AFRICA

The Constitution founded South Africa on democratic principles and established three government spheres that have law-making and executive functions and powers (RSA, 1996). The following is a discussion of the statutory framework guiding water service delivery to citizens in South Africa. The section looks at the Constitution, the Strategic Framework for Water Services, the Water Services Act of 1997, and the National Water Act of 1998.

2.6.1 Constitution of the Republic of South Africa, 1996

The Constitution, Section 152 - indicates that one of the local government's objectives is "to ensure the provision of services in a sustainable manner." As promulgated in the Constitution, the Bill of Rights indicates the distribution of essential services as processes to enhance the standard of living of poverty-burdened citizens (Khangale, Madumo & Tshiyoyo, 2023). "The right of access to sufficient water" is emphasised in Section 27(1) (b) of the Constitution. District municipalities are assigned the

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responsibility of water service delivery. Section 156(1) of the Constitution declares district municipalities as having decision-making powers and manage water infrastructure, that is, water supply systems and reservoirs so that water is safe for drinking as well as accessible to communities (RSA, 1996). Given this description, Driekoppies constitutional mandate is to provide citizens with permanent water services.

2.6.2 The Strategic Framework for Water Services

The Department of Water Affairs and Forestry (2003) defined a *strategic framework* as a logical and methodical way of providing water services in South Africa. This framework summarises water service provision from small community schemes supplying water in isolated rural areas to regional schemes supplying water to larger urban areas (DWAF, 2003). Additionally, this framework emphasises that the DWAF must make sure that institutions conform to regulations that provide water services to the people, not just be operational regarding service provision. Water supply matters and sanitation act as a broad platform for the water services sector, which is addressed by the *Strategic Framework for Water Services* (SFWS) (DWAF, 2003). This framework is considered an umbrella framework because it explains finances, planning and implementation and lays out the overall goals of integrated water-resource management. During the COVID-19 pandemic, this framework became even more critical as access to clean water was essential for hygiene practices like handwashing to prevent virus transmission. However, existing challenges in water resource management including unequal access, poor infrastructure and rising demand made it difficult for vulnerable communities to follow public health guidelines, thus exacerbating the spread of the virus.

2.6.3 The Water Services Act, 1997

According to De Waal, Currie, and Erasmus (2001:423), the National Water Act No. 36 of 1998 (NWA) (RSA, 1998b) must be read with the Water Services Act (WSA) No. 108 of 1997 (RSA, 1997), which is "the primary legal instrument relating to the accessibility and provision of water services (which include drinking water and sanitation services)." The mandate of ensuring access to water lies with water services

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authorities, which are municipalities, and these water service authorities, through water service providers, must ensure access to both water supply and sanitation services, according to the WSA (RSA, 1997).

The WSA is an essential legislation that guides the water service sector in South Africa, especially in the district municipalities that support the Bill of Rights by regulating water and sanitation to guarantee that every citizen is eligible for a minimal level of service. The Minister of Water Affairs and Forestry is allowed to make compulsory national standards for the delivery of water and service through Section 9 of the legislation so that water provision is there consistently (Khangale *et al*., 2023). When it comes to using water, the WSA declares that every person has the right to essential water provision, and any actor that provides water service should make necessary efforts to ensure that the water right is realised. The legislation states that local and district municipalities are the water service authorities in their areas of jurisdiction, and they can be the ones to provide water services or find service providers in that sector to do so (RSA, 1997; Khangale *et al*., 2023).

2.6.4 The National Water Act, 1998

The NWA declares the responsibility of the state by highlighting in Section 3 that "as the public trustee of the nation's water resources, the National Government, acting through the Minister, must ensure that water is protected, used, developed, conserved, managed and controlled sustainably and equitably, for the benefit of all persons and in accordance with its constitutional mandate." This Act acknowledges the national government and guides the management of water resources, including the allocation of water for beneficial use, the redistribution of water, and matters that affect international waters (RSA, 1998b; Lawyers for Human Rights, 2009; Khangale *et al*., 2023). Because of the legacy of the apartheid regime, which had biased laws and practices, the NWA recognises that water is scarce. Its distribution is unequal; therefore, there is an appreciation that it is a basic need for every citizen (Khangale *et al*., 2023).

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2.7 WATER DELIVERY DURING THE COVID-19 PANDEMIC AND REGULATORY FRAMEWORKS GUIDING THE PROVISION OF WATER SERVICES IN SOUTH AFRICA

The local government's mandate is to provide water and sanitation services to communities. This section outlines the Local Government: Municipal Systems Act 32 of 2000 (Municipal Systems Act) (RSA, 2000) and Integrated Development (DSD, 2025), which are key regulatory frameworks guiding local government planning.

2.7.1 Local Government: Municipal Systems Act 32 of 2000

The Municipal Systems Act (RSA, 2000) provides the core principles, framework, and procedures to allow municipalities to support their communities socially and economically and guarantee affordable essential services to everyone. This Act refers to the provision of essential municipal services, which means municipal services necessary to ensure an acceptable and reasonable quality of life without which public health or environmental safety would be at risk (RSA, 2000). The Act seeks to empower people with low incomes and ensure that municipalities establish service tariffs and credit control policies that consider their needs. Section 4 (2) (d) of the Municipal Systems Act states that the council of a municipality, within the municipality's financial and administrative capacity and having regard for practical considerations, must "strive to ensure that municipal services are provided to the local community in a financially and environmentally sustainable." (RSA, 2000).

2.7.2 Integrated Development Plan

Section 25 of the Municipal Systems Act (RSA, 2000) states that at the beginning of its elected term, each municipal council must adopt a single, inclusive, and strategic plan – an Integrated Development Plan (IDP) (RSA, 2000). This is for the municipality's development, which links, integrates, and coordinates plans, considers proposals for the municipality's development, and aligns the municipality's resources and capacity with the implementation of the said plan (RSA, 2000). The IDP is developed as a plan for an area and provides an overall framework for development. It also aims to

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coordinate the work of local and other spheres of government in a logical plan to improve the quality of people's lives living in an area. Furthermore, it considers the existing conditions, challenges, and resources available for development to achieve economic and social development in the area (RSA, 2000).

2.8 IMPEDIMENTS TO THE IMPLEMENTATION OF SOUTH AFRICA'S WATER POLICIES

The South African government treats water as a natural asset under its jurisdiction. The National Water Act advocated for establishing Catchment Management Agencies (CMAs) whose mandate is to dispense water resource administration to the local or catchment ranges and allow communities to participate in water management (Munnik, 2020). Lamentably, institutional and capacity constraints have hindered the application of these policies and strategies. Haigh, Fox and Davies-Coleman (2010) point out that, amongst other things, policies and strategies are hindered by inadequate human capacity to implement them, especially at the local level. The absence of critical skills such as water engineers and water scientists in the water sector who can monitor and evaluate infrastructure development effectively in South Africa is also an impediment (Donnenfeld *et al*., 2018).

South Africa is still a developing nation, and policies are severely hindered by inadequate financial resources (Viljoen & van der Walt, 2018). Similarly, Howes, Wortley, Potts and Dedekorkut-Howes (2017) also highlight that underfunding is one of the main challenges to the water sector in South Africa. Viljoen and van der Walt (2018) argue that a budget of R126 billion or R33 billion is required each year for the next decade to build and sustain new networks and replace and modernise the current infrastructures if the country is to guarantee water security for all citizens. The change from management to governance has brought more financial pressure and managerial predicaments at the community level. The decentralisation policy was not met with political will and financial empowerment in the local government sector (Haigh *et al*., 2010).

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Institutional and governance problems also hinder the implementation and execution of water-related policies in South Africa. The OECD (2015) argues that the country has widespread fragmentation across different institutions and levels of administration on water policies and programmes. This has resulted in questions about vertical and horizontal harmonisation for the effective implementation of policies. Furthermore, strategy implementation is not performed collectively but separately, which then derails or even jeopardises the execution of these policies (Donnenfeld *et al*., 2018). Lack of accountability, absence of proper and clearly defined objectives, political interference, and weak information circulation structure are other impediments to the implementation of water policies in South Africa. These challenges became even more pronounced during the COVID-19 pandemic when reliable water delivery was crucial for maintaining hygiene and preventing the spread of the virus. Poor governance and mismanagement led to water shortages, particularly in vulnerable communities, making it difficult for people to follow basic health measures like handwashing and sanitation. As a result, the pandemic exposed and intensified existing weaknesses in the country's water infrastructure and policy implementation.

2.9 WATER SERVICE DELIVERY ACTORS IN SOUTH AFRICA

In its quest to meet water demand and provide clean and safe water, the government has forged partnerships with NGOs and the private sector. The section below looks at the role that these actors play in delivering water to citizens in South Africa. The various actors include the government, the private sector, and NGOs.

2.9.1 COVID-19 and the role of government in addressing water challenges

This section examines the three government tiers: national, provincial, and local.

The South African system of governance recognises three spheres of government: national, provincial, and local, which is a democratic model of cooperative government. Section 40 of the Constitution (RSA, 1996) encourages the national, provincial, and local spheres of government to promote cooperative governance around the principles of interconnectedness, distinctiveness, and interdependence. Buire (2011) shares that

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the whole point is to decentralise service delivery through a system of subsidiarity, which ultimately leads the government to be closer to people and address their problems.

The ratification of the Intergovernmental Relations Framework Act No. 13 of 2005 (RSA, 2005) came up with a legislative framework that upholds partnership amongst these three levels of government. This platform allows these spheres of government to interact, cooperate, and coordinate their efforts, including coming up with policies, distribution and use of resources, planning and implementation, and the synchronisation of service delivery initiatives. For service delivery to be accomplished, every government level should fulfil its duties and functions. Below is a discussion of the three spheres of government (national, provincial, and local) and their role in water service delivery.

2.9.1.1 COVID-19 and the role of the national government in water service delivery

The national government's task is to develop policies that help in providing services to citizens. For example, the water service infrastructure framework was developed at the national level to be implemented by district municipalities (COGTA, 2022). The national government plays a strategic role by contributing on how municipalities function through creating a legislative framework for local administration. The Constitution of the country lists the provision of safe water to drink as a fundamental human right; therefore, the national government oversees that district municipalities execute their mandate and accomplish it (COGTA, 2022).

The Department of Water Affairs and Forestry (DWAF) is mandated to set national policy frameworks and standards for the delivery of water services to citizens. The National Water Act (NWA), provides a platform for an all-inclusive legal framework for managing water resources in South Africa, which is the national government's duty. The NWA (RSA, 1998b) preface states, "acknowledging the National Government's overall responsibility for and authority over the nation's water resources and their use,

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including the equitable allocation of water for beneficial use, the redistribution of water, and international water matters" (RSA, 1998b).

2.9.1.2 COVID-19 and the role of the provincial government in water service delivery

According to Khangale *et al*. (2023), the provincial government is mandated with basic service delivery because it is supposed to implement programmes to deliver different services to citizens. The provincial government mandate is to provide a platform that allows capacity development of local government so that municipalities can carry out their responsibilities and functions and oversee matters of their jurisdiction (Malan, 2005). Asha and Makalela (2020) point out that the provincial government must help to support the capacity of municipalities to strengthen and improve essential service delivery. Schedule 5 of the Constitution gives the provincial government the jurisdiction to deal with issues within the province (RSA, 1996). Section 139 of the Constitution grants the provincial government the responsibility to intervene where municipalities fail to deliver on services, as mandated by their constitutional and legal obligations. Given these obligations, provincial governments have a critical role in overseeing service delivery implementation at the local level (Khangale *et al*., 2023).

2.9.1.3 COVID-19 and the role of local government in water service delivery

According to Section 152(1) of the Constitution (RSA, 1996), the objectives of local government are to:
(a) provide democratic and accountable government for local communities;
(b) ensure the provision of services to communities in a sustainable manner;
(c) promote social and economic development;
(d) promote a safe and healthy environment; and
(e) encourage the involvement of communities and community organisations in matters of local government.

The Department of Water Affairs (DWA) (2012) states that the Municipal Infrastructure Grant (MIG) (COGTA, 2025) is a funding arrangement for municipalities that combines

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all existing capital grants for municipal infrastructure into one consolidated grant. These various capital grants provide authority to municipalities over infrastructure projects under their jurisdiction and ensure that effective planning and service delivery are incorporated. The grant operates on the following fundamental principles:

1. Funding the provision of basic infrastructure, that is, a basic level of service;
2. Providing service to people experiencing poverty; and
3. Creating employment by providing infrastructure.

The local government is the sphere closest to citizens and must deliver essential services such as water through their municipalities. According to Van der Linde (2006), the DWS is the overall sector leader whose mandate is to ensure that institutions at local government level give the support stipulated in Section 154(1) of the Constitution (RSA, 1996). Weaver, O'Keeffe, Hamer and Palmer (2017) identified a strong connection between water service provision and why municipalities were formed. They recognise this because of the notion that essential service delivery and water provision are the primary core functions of municipalities. Araral and Wang (2003) share that some of the challenges that the water sector face can be because of the failure to create synergies between water agencies and municipalities.

2.9.2 COVID-19 and the role of private sector in water service delivery

Private sector involvement and participation in public service delivery is not a new concept. There has been a huge growing market for public-private partnerships (PPP) that has developed globally in the last two decades. These public-private partnerships are prevalent in industrialised countries as the private sector has serviced public needs through construction, maintenance, and contract management. A PPP may, therefore, be defined as a mechanism by which the public sector procures services from the private sector for an extended period. It usually involves using public assets and investment in assets by the private sector (Handley-Schlacher, 2003). In South Africa, the private sector has a critical role to play in the provision of water to citizens.

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Developing nations such as South Africa are actively looking to bring private sector resources to help achieve development objectives and provide service delivery to citizens. The PPP model that South Africa has been implementing is based on lessons learned and the subsequent advances made in developed nations such as the United Kingdom (UK) and the United States of America (USA). According to Rwelamila and Snijder (2008), the rationale for developing a local PPP market in South Africa is rooted in the recent history of transformation augured with the first democratic elections in 1994 and the service delivery targets set by the government. They state further that a substantial portion of the capital funding was to come from the national government through its various grant-funding mechanisms. However, capital investment forecasts predicted a considerable shortfall in the national allocations to municipalities to extend and maintain services (Jackson & Hlahla, 1999).

In response to the needs at the local government level, the municipal services partnership (MSP) policy was developed so that services can improve. According to Sinclair (1999), the policy framework has vital features that identify three main partnership options, which are:

1. Public-private MSP;
2. Public-public MSP – a partnership arrangement between a local authority and any other public entity and
3. Public-non-governmental organisation (NGO).

In conjunction with the subsequently promulgated MSA (RSA, 2000), and the Local Government: Municipal Finance Management Act (MFMA), Act 56 of 2003 (RSA, 2003), the MSP laid the foundation for the development of municipal PPPs with a specific focus on delivering core services to communities (Rwelamila & Snijder, 2008). Rwelamila and Sneider (2008) state further that the MSA provides for an assessment of internal and external service provision mechanisms, and the MFMA provides broad guidelines for the establishment of PPPs at the local level. Municipal public-private partnership regulations were published in 2005 by the National Treasury.

The Municipal Infrastructure Investment Unit (MIIU) was formed in 1998 to help set up PPPs for the delivery of municipal services by funding infrastructure-related projects'

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development. It was initially set up for a five-year lifespan, but when it ended, it was further extended by another three years up to 2006. After its establishment, in the first three weeks, the MIIU was inundated with applications for assistance from municipalities (Hlahla, 1999). According to Kotze, Ferguson and Leigland (1999), the first two PPP contracts to be signed in the water services sector were with foreign private partners with the help of the MIIU, and these were the Dolphin Coast and the Nelspruit concessions.

Rwelamila and Snijder (2008) postulate that in South Africa, the private sector's involvement in the water service industry started before the dawn of democracy in 1994. Private contractors have performed a lot of infrastructure development (capital projects). Even after independence, some rural water schemes were still maintained by private contractors under the management of the DWAF and regional boards (Rwelamila & Snijder, 2008). Private sector involvement of this nature has often been quoted in defence of longer-term PPPs in the water service industry. Research about the implication of PPPs on people experiencing poverty (DWAF, 2002) found that of the five mentioned PPPs, two were set up before 1994. The reasons for setting them up were capital investment requirements, efficiency improvements, and operational support. However, the transformation process of the local government affected all these five PPPs, notably the expansion of the municipal jurisdiction after municipal boundaries were demarcated in 2000. The Water Service Act (RSA, 1997) stipulates that for any municipality to bring in a private sector service provider, it must have considered all known public sector water service providers willing and able to perform the function (DWAF, 2002).

Snijders (2008) found that notwithstanding the role of the MIIU in bringing technical assistance and resources, water service PPPs in local government have lacked growth and still fall short of meeting the rising demand for municipal services. He argues further that the cost of infrastructure development, the demand for higher service levels (more advanced than the government-funded minimum Reconstruction and Development Programme (RDP) (RSA, 1994) standards), institutional and organisational limitations of local government to manage and operate service delivery to vast (and often newly constituted) municipal jurisdictions, and poor cost recovery are some of the factors constraining local development, particularly in the water sector.

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The ever-transitioning local government and the over-expectation that is placed on limited human capital and limited financial resources to implement service delivery are impacting efforts of coming up with a solid and coordinated local government sector that stands a better chance of attracting private partners to joint service delivery commitments (Rwelamila & Snijder, 2008).

2.9.2.1 Public-Private Partnerships challenges

Evaluating the value-for-money benefit, usually based on ex post facto appraisals of PPP projects, is essential for future justification of the PPP option in public service delivery. Edwards and Shaoul (2003) discuss two case studies that sought to determine the value for money (VFM) benefits derived from the projects involving the information technology sector. They conclude that effective risk transfer to the private sector is not readily achievable. Hood and McGarvey (2002) concur with this view in their assessment of risk management initiatives in Scottish local government, stating that risk transfer is, at best, a very unclear and poorly understood concept and, at worst, weighted in favour of the private sector. In Edwards and Shaoul's (2003) study, the concluding evidence suggests that the critical risk associated with the two projects was transferred to the user-public regarding service inconvenience and the irreversible impact of late service delivery with minimal contractual recourse to penalise the private sector party.

Public-private partnerships involve long-term contract relationships between the public and the private sector when they are established. In light of such a relationship (extended), there is generally the issue of things being protracted; for example, the procurement process, which will go through multiple phases such as pre-qualification bids, selection bids, evaluation of proposals, and negotiations with parties to choose the preferred bidder with whom the final agreement is negotiated. Because of the formal nature of contracts, both parties need the expertise to understand the expectations of the agreement (Rwelamila & Snijder, 2008). A model for the governance of contractual relationships was developed by Grimsey and Lewis (2004), which considers uncertainty in any long-term contract and the far-reaching importance of a relational contract. The relational contract is one where the contractual

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environment conditions are flexible and can change, unlike the traditional transactional contract, which is rigid.

According to Rwelamila and Snijder (2008), the universal reality of detailed national frameworks and implementation guidelines regulating the PPP market has given rise to the debate about steering mechanisms. The extent to which the market is regulated and the means used to regulate implementation reflect the intention of national governments with PPP initiatives and seem to constrain flexibility at the local level (English & Guthrie, 2003; Broadbent & Laughlin, 2003). The PPP market has become a global business opportunity for industrialised countries, to the extent that national governments are beginning to reconsider their PPP regulatory frameworks to ensure sufficient interest in local PPP markets to meet public sector demand for privatised service delivery (Rwelamila & Snijder, 2008).

2.9.3 COVID-19 and the role of non-governmental organisations in water service delivery

The Water Supply and Sanitation Policy (DWAF, 1994) acknowledges the NGOs' role in South Africa over the years under difficult and dangerous conditions. Much of their work was centred on lobbying and fighting for the rights of the oppressed, and most especially, part of the struggle was against the powers of the state. The Department of Water Affairs and Forestry is committed to NGOs, and much of their mandate and work is influenced by the communities in which they work. The community under which the NGOs work is made as the client, which is the principle they work under, just like the private ‘for profit’ sector. The Mvula Trust became the official implementing agent of the Reconstruction and Development Plan (RDP) (RSA, 1994) for water, sanitation, and related services (The Mvula Trust, 2025). The role of NGOs in water delivery is critical because they work closely with the communities and understand the challenges experienced firsthand. Like the private sector, the NGOs' role in water delivery is ineffective, as pointed out by the Water Supply and Sanitation Policy (DWAF, 1994). For NGOs to work better and enhance their relationship with the government, more funding and support are critical, as NGOs are essential in working with communities.

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2.9.4 COVID-19 and the role of water boards in water service delivery

Water boards are critical in South Africa because they provide water to local governments. Twelve water boards in the country supply total bulk potable water in high volumes (DWA, 2012). Nevertheless, not all municipalities rely on water boards for regional bulk water supply infrastructure. However, they can achieve this if they function within the parameters of the set norms and standards of the Water Services Act, National Water Act, and other related regulations. The Water Services Act stipulates that any water boards or any water service provider whose services are required must be appointed by the recipient municipality to provide services in any community where those services are required.

2.10 New Public Management (NPM) in South Africa

Primary service delivery, such as the provision of water for citizens, requires significant reforms to be implemented and a shift from old public administration. The concept of New Public Management has been adopted in many developed nations However, research indicates that many developing nations, especially in Africa, struggle to implement this concept (Rubakula, 2014). This concept spread in the 1990s in many African countries, and they decided to adopt the New Public Management model as a framework for administration to achieve high efficiency and effectiveness in their public sectors. However, because of many problems confronting the reform process, new public management reforms have continued to be partially implemented in Africa. (Rubakula, 2014:85). According to Chipkin and Lipietz (2012), currently, South Africa lacks a model of public sector reform that is based on an analysis of apartheid modes of governance and how to overcome or democratise them – a mode of government characterised by extreme bifurcation across administrations, the dominance of neo-patrimonial relations in former *bantustans*, politicised bureaucracies.

For a successful shift to NPM, numerous things are required. To begin with, skills and knowledge are fundamental. Muthien (2013) argues that to fully execute a development mandate, the success of both Weberian and NPM bureaucracies requires an administration that is skilled and experienced. A mixture of 'old guard' and

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'new age' sets of skills and experience in one public service led to uneven outcomes in service delivery. Therefore, lacking skills and experience will mean that providing services such as water delivery will be difficult.

Secondly, the approach to service delivery should be improved. Engida and Bandil (2012) argue that the new paradigm in government service delivery necessitates adopting a business-oriented approach to managing state affairs which incorporate marketing and production techniques. An upgrade on the systems and procedures for conducting duties is also imperative, which would mean a move to e-government, where methods and procedures would be computerised (Carstens & Thornhill, 2000).

The literature on NPM is important in terms of service delivery, especially water delivery in the context of the COVID-19 pandemic. It shows that the success of the public sector is highly dependent on improving skills and effective systems, which will then lead to better service delivery. It also further shows the need to improve the way reforms are implemented so as to ensure the quality of services. The principles of NPM emphasise efficiency, accountability and performance-driven service delivery, all of which are crucial for addressing water delivery challenges particularly during crises like the COVID-19 pandemic, which exposed systemic weaknesses in water governance, highlighting the urgent need for skilled personnel, efficient management systems and well-implemented reforms to ensure equitable access to clean water. In many underprivileged communities, poor service delivery was exacerbated by bureaucratic inefficiencies, corruption and inadequate infrastructure making it difficult for residents to comply with public health measures such as handwashing and sanitation.

By applying NPM principles such as performance-based management, decentralisation, and public-private partnerships, water services could be improved to enhance accessibility, transparency and responsiveness in times of crisis. Strengthening institutional capacity and implementing well-structured reforms are therefore essential for ensuring the resilience and sustainability of water service delivery in South Africa both during the COVID-19 pandemic and in future public health emergencies.

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2.11 CONCEPTUAL FRAMEWORK

According to the United States Government Accountability Office (GAO, 1998), performance measurement develops measurable indicators that can be systematically tracked to assess progress in achieving predetermined goals or standards. The Ontario Ministry of Rural Affairs (2021) defines a *performance measurement system* as a formal, regular, rigorous system of data collection and usage that measures changes in effectiveness and efficiency to illustrate an entity's relative performance over time. Performance measurement is essential and is used as a guideline to attain best practice through seeking sustained improvement in the entity's key business processes.

The ever-increasing shortage and deteriorating water quality resources are now seriously challenging South Africa. These problems can be attributed to climate change, demographic factors, and economic growth, which are not easy to contain. Nitikin, Shen, Wang and Zou (2012) argue that pressing environmental problems call for radical policy measures to curb water demand and to increase environmentally sustainable water supply. These measures could include specific policy measures to address a variety of issues at different levels of engagement. Policy changes may affect the lives and welfare of people if measures to protect them are not put in place. For example, Nitikin *et al*. (2012) point out that increasing prices to dampen the water demand and enlarge its availability in the medium to long run will reduce access to water for people experiencing poverty in the short run.

Performance measures are essential to achieving best practices through persistently seeking continuous improvement in the entity's critical business processes. The Regulatory Performance Measurement System (RPMS) is a simple web-based tool used by the DWAF to measure performance against key performance indicators (KPIs) and to determine performance trends to promote best practices in the sector (DWS, 2017). The system calculates activities according to key performance indicators highlighted in the National Water Services Regulatory Strategy (DWA, 2013). Unfortunately, the results of such performance measurements are not up to standard and have been subject to various service delivery protests in communities

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that have been dominant in municipalities of South Africa. These protests, which have taken a form of collective action where people come together to take political action, highlight the urgent need for improved water service delivery. Knowledge of how best to use this web-based tool to assess the performance of water service delivery for WSAs is lacking, and it is the missing link in the acknowledgment of how water services are delivered in South Africa.

A performance measurement system is essential for evaluating the efficiency, effectiveness and accountability of water service delivery, particularly in the context of the COVID-19 pandemic, where access to clean water was crucial for hygiene and public health. In South Africa, the pandemic exposed long-standing weaknesses in water provision, including poor infrastructure, governance failures and service inequalities which disproportionately affected rural and low-income communities. Without proper monitoring and evaluation mechanisms, it became difficult to track water supply efficiency, response times and policy implementation during the crisis. A well-structured performance measurement system could have helped identify bottlenecks, resource mismanagement and service gaps, allowing for better decision-making and targeted interventions. By incorporating KPIs such as water accessibility rates, response efficiency and infrastructure maintenance, authorities could enhance accountability and service delivery, ensuring that future public health emergencies do not further exacerbate water access challenges.

2.12 CHAPTER SUMMARY

This chapter has defined the concepts that anchor this study. Once that was achieved, it provided global and local perspectives on service delivery. The literature shows that South Africa is still struggling with achieving service delivery, leading to service delivery protests by citizens. The chapter also looked at the theory of the study, which is the Social Contract Theory, and it showed how the Constitution binds the government of South Africa as a contract with the citizens to provide services, especially water service delivery. The chapter also outlined the various statutory and regulatory frameworks that guide the government regarding water provision to citizens. It also delved into the roles of various non-state actors, such as the private sector,

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NGOs, and water boards, in water provision, highlighting their unique contributions and challenges.

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CHAPTER THREE: RESEARCH APPROACH AND METHODOLOGY

3.1 INTRODUCTION

According to Marshall and Rossman (1999:22), "research conduct represents decisions the researcher has made that a particular theoretical framework, design and methodology will generate data appropriate for responding to the research questions.". Several methods were employed in this study to gather data from Driekoppies community to gain a greater understanding of COVID 19 and water delivery challenges. The chapter explains and describes the research design, data collection methods, and data analysis techniques adopted in this study. Data collection methods that were in the field include interviews, observation and document reviews.

This chapter begins by explaining the research methodology, approach and design that was used. It also discusses the philosophical assumptions underpinning this research and introduces the research strategy and the empirical techniques applied. The second section discusses the methodology and methods used to analyse data for this research. The study challenges and limitations that had been experienced are also given and ethical considerations of the study are presented at the end.

3.2 RESEARCH METHODOLOGY

The type of tools and procedures used in a research process is known as the methodology (Mouton, 2001). The specific tasks that the researcher engaged in are presented. The data that was gathered was mainly qualitative, as the research looked deep into the social life of community members during the COVID-19 pandemic and the water delivery challenges experienced in Driekoppies. Here, I begin with the research approach, followed by the research design.

3.2.1 Research approach

The study sought to gather experiences and opinions from residents and information from officials of the Driekoppies community, which are essential in supporting the objectives of this study. Therefore, a well-considered phenomenological approach is

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the most appropriate since the research is qualitative. According to Creswell (2003:15), "In phenomenological research, the researcher identifies the ‘essence’ of human experiences concerning a phenomenon, as described by participants in a study." Phenomenology studies experience from the individual's perspective, 'bracketing' taken-for-granted assumptions, and usual ways of perceiving (Creswell, 2003). When dealing with humans, this translates into gathering 'deep' information and perceptions through inductive, qualitative methods such as interviews, focus groups, and participant observation and representing it from the perspective of the research participant(s).

3.2.2 Research design

A research design is the meticulous and appropriate choice that a researcher makes to ensure that their research is completed successfully. According to Kumar (2014), a research design is a comprehensive plan that explains the various methods and procedures that will be implemented accurately, objectively, validly, and economically during a research process to find answers to the research questions. Babbie (20110) postulates that a research design explains an approach used to test a thesis' problem statement, as this will determine and provide the basis for the research techniques to use in the study. Within the context of this study, it provides and explains the framework for the choice of research methods used by the investigator to collect data to consider perspectives on the issue under investigation.

Qualitative and quantitative research methods have fundamental differences. De Vos and Strydom (2011:15) explain qualitative research as "Qualitative researchers are interested in capturing the individual's point of view through multiple strategies such as interviewing and observation," whilst quantitative research reality is considered observable and measurable and generally follows a positivist paradigm. The choice of a qualitative approach for this study was based on its exploratory, explanatory, and descriptive nature, which was deemed most appropriate for investigating COVID-19 and water delivery challenges in the Driekoppies community.

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Exploratory designs are carried out on research problems where none or a few earlier studies have been conducted to refer to or rely on to predict an outcome (Cuthill, 2002; Taylor, Catalano & Walker, 2002). These studies seek insight and familiarity so that investigations or undertaking of research problems in the preliminary stages of understanding are conducted for later investigation. This exploratory research objective investigated the under-researched area of COVID-19 and the water delivery challenge in the Driekoppies community.

The research was explanatory because it sought to explain the experiences and perspectives of community members of Driekoppies. The focus was on seeking, providing, and evaluating these two areas' influence on each other, explaining an essential and meaningful fundamental relationship. The study was also descriptive because it documented and described the challenges of water delivery, opinions and differences on issues and how the differences influence the results (Merriam, 1998), and the process and how the data that was collected was used (Marshall & Rossman, 1999). Crowe, Cresswell, Robertson, Huby, Avery and Sheikh (2011) described the interpretive case study approach to achieve this (refer to next section).

Nevertheless, the exploratory design has limitations. Cuthill (2002) and Taylor *et al*. (2002) point out that one challenge is that the sample sizes are generally small, which makes it impossible to generalise the findings to the larger population. Because of this limitation, one cannot make definitive conclusions about the findings. Inasmuch as it provides a starting point for insights into a phenomenon, the conclusions given are not definitive. However, these limitations do not diminish the value of the insights gained from the exploratory design.

3.2.3 In-depth case study

This study's primary data collection method was a comprehensive case study utilising qualitative research methods. Simons (2009, as quoted in Hesse-Biber & Leavy, 2011:256) defines a case study as:

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> In-depth exploration from multiple perspectives of the complexity and uniqueness of a particular project, policy, institution, program, or system in a "real-life" context. It is research-based, inclusive of different methods, and evidence-based. The primary purpose is to generate an in-depth understanding of a specific topic … to generate knowledge, and to inform policy development, professional practice, and civil or community action.

A case study research is useful when 'how' and 'why' in a contemporary phenomena question is posed in a real-life context and when the researcher does not have much control over events (Yin, 2003). Much of the data was collected through interviews and participant observation by the researcher from people staying in the Driekoppies community. A case study design is essential because it offers an overall framework that can be used to review events within their real-life context (Yin, 2003). Retaining the holistic and meaningful characteristics of real-life events is particularly advantageous when the research's relevant theory is holistic (Yin, 2003). In the context of this research, a case study was adopted to assess COVID-19 and water delivery challenges in the Driekoppies community.

When case studies are chosen based on typicality rather than uniqueness, they can be used to derive lessons that can be applied to other cases as they are so informative, especially the recommendations. Creswell (2003) notes that during a case study, researchers gather detailed information over a sustained period with the help of different data collection procedures. The use of a case study is supported by Hamel, Dufour and Fortin (1993), who point out that it has the ability to bring greater insight and understanding of the dynamics of a specific situation. Even though they can be used to scale up recommendations, case studies are primarily context-specific and are rarely there for replication (Robson, 1993). The most outstanding aspect of the case study is its flexibility; however, Kane and O'Reilly de-Brún (2001) share that it also has its limitations. One of the limitations is that it is time-consuming, the time intended for finishing is compromised, and time constraints from the researcher side or interviewees mainly cause it. In addition, case studies require a mix of research skills for data collection and analysis, which could be a source of error if the researcher does not have rigorous data analysis skills (Mouton, 2001).

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3.2.4 Target population and sampling

Boyatzis (1998) argues that sampling can affect the phenomenon of interest: setting, events, people, and relationships. He further shared that a sampling design using thematic analysis should be for adequacy and appropriateness regarding efficacy, efficiency, and ethics. The unit of analysis is the entity on which an interpretation of the study would focus. In contrast, the coding unit is defined as a basic element or segment of raw data that can be used meaningfully to explain the phenomena. (Boyatzis, 1998).

The people living in the Driekoppies community were used as the unit of analysis for sampling. The main idea in sampling was to select individual cases so that the most illuminating and useful data would be unearthed, which best addressed the research questions (Palinkas, Horwitz, Green, Wisdom, Duan & Hoagwood, 2015). I chose purposive sampling instead of theoretical sampling because of the characteristics of key relevance to the research questions that I know or suspected (Palinkas *et al*., 2015).

Theoretical sampling methods are used in the development or when testing a theory. They use iterative processes of choosing additional cases to refine and test aspects of emerging findings until saturation is reached. Conversely, purposive sampling uses deliberate cases to represent characteristics of known or suspected relevance to the research questions. The selection criterion is determined by reviewing existing information and recommendations followed through the sampling (Palinkas *et al*., 2015). According to Neuman (2011), the qualitative sampling objective is to reach the point of deep understanding about an extensive process, relationship, or social setting.

To understand the COVID-19 and water delivery challenges of the Driekoppies community, I chose 12 (eight women and four men) participants to reflect on common problems specific to the area. Community members who could share their experiences and identify with the water issues were selected. My choice of participants was such that I would extract all the distinctive aspects of the social setting of Driekoppies. Most importantly, the participants whom I selected were directly in touch with the COVID-19 pandemic and water delivery challenges and had accumulated some views and lived realities around the challenges.

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I also used purposive sampling for the four key informants who participated in the study. An official from the Department of Water Affairs provided an overview of the funding of Nkomanzi Local Municipality. Driekoppies falls under their governance, and he gave a strategic approach to awareness around water issues, focusing on poor communities. The head of water and sanitation was also one of the critical informants so that I could find information on the type of problems that Nkomanzi Local Municipality has faced during the COVID-19 pandemic and the periods preceding that time. A third official whom I interviewed was from the water demand section, to gain perspectives on demand-related problems in Driekoppies. The last official was from the water quality section of Driekoppies, who provided me with information on the importance of providing clean and safe drinking water to community households.

3.3 RESEARCH METHODS

When I look at the research questions I had, the methods I used helped with supporting the carrying out of five tasks: (a) elicit in-depth individual discussions related to the research questions, (b) deliberately include voices from a range of perspectives, including marginalised groups and individuals, (c) situated and made sense of data collected within broader national and international discourses, (d) identified and analysed key concepts and issues; and areas of convergence, divergence and heterogeneity in the data collected, (e) provided multi-focal feedback on researcher interpretation of data (Edwards, 2011). I drew on various data collection and analytic techniques to meet these needs.

In this section, I explain how I used the research instruments in the field to gather information on households' water delivery challenges during the COVID-19 pandemic. I start by discussing interviews, followed by observations, and then end with a document review of a technique and how I used it.

3.3.1 Interviews

According to Rubin (2005), interviews are structured conversations comprising main questions, follow-up questions, and asking probing questions. I prepared the main

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questions for the interview sessions well ahead of my field visit so that I could cover all major parts of the research problem. I ensured that all my interview questions were as open-ended as possible so that households would share their best insights and opinions and talk about the specific experiences that motivated the study. The main questions were crafted to elicit the understanding and experiences of interviewees in ways that they could engage and respond to the research problem. Because of the nature of my study, close-ended questions would not assist me in drawing unique insights and experiences from households.

I translated my study research questions into ten main interview questions that households could easily engage in based on their experiences in the community. I then came up with a template for recording, which I prepared from interview questions, and this helped me during the interview sessions to make sure that all the information from interviewees was recorded. The follow-up questions were made to be specific to comments or utterances made by the interviewees (Rubin, 2005). In drafting follow-up questions, I listened attentively to understand the meaning of what the interviewees were saying. Further questions were posed so that I could explore specific themes, concepts, and ideas that were introduced by the interviewees (Rubin, 2005).

Since I was the main instrument for data collection, I listened attentively to the interviewees narrating their experiences, and where necessary, I would ask additional questions that explored the ideas in further detail. This helped me to ensure that I would capture the themes and concepts that arose from the households. Through asking probing questions, I could keep interviewees engaged on any matter that I found interesting or important to complete an idea or fill in a missing piece, as Rubin (2005) indicates.

I interviewed the head of water and sanitation at Driekoppies to establish a broad perspective on community households' experiences in providing water delivery during the COVID-19 pandemic. A second interview was conducted with an official from the Department of Water Affairs to understand if there is any strategic approach to challenging times such as the COVID-19 pandemic period. A third official I interviewed was from the water demand section to gain perspectives on demand-related problems in Driekoppies. The last official was from the water quality section of Driekoppies, who

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provided me with information on the importance of providing clean and safe drinking water to community households. Twelve community members, who included three community leaders, were interviewed and shared their experiences about COVID-19 and water delivery in their community.

3.3.2 Participant observation

According to Fraenkel and Wallen (2009), participant observation is when a researcher participates in the situation or setting that they are observing. Participant observation is 'not an external method administered on research subjects like questionnaires or lab tests, …[but]…it is a way of being with familiar and unfamiliar life-worlds.' (Clifford, French & Valentine, 2010:117). Data collected through participant observation was mostly from meetings held in the office, seminars, and sessions with external consultants, general conduct of officials in the office, corridor discussions, and behaviours during one-on-one sessions. I also had long conversations with a few officials, gathering critical information through observation about organisational culture. I also utilised participant observation to understand further local realities and current conditions of Driekoppies Dam in the Nkomanzi Local Municipality.

3.3.3 Document analysis

Many settings in today's society are literate, and much of the life we live every day is organised around the production and use of documents. These are the resources that are valuable to qualitative research. Some of the important and relevant documents for data collection were collected during and after the interviews; some of these were the municipal *Integrated Development Plan 2022-23*, its water service development plan (WSDP), and the annual performance reports. These documents were critical to extracting data related to planning and performance in the provision of water services by the municipalities and the case study area.

The *State of the Nation Addresses* for 2023 and 2024 (RSA, 2023; 2024) and the *Blue Drop Report* (DWS, 2023) were other analysed documents. Content analysis was mainly performed on the *Blue Drop* and the *Annual Performance* reports as I studied the performance trend of Nkomanzi Local Municipality and made comparisons. Given

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that most documents were publicly available, creating an archive was easy and free of the complications of seeking consent (Rapley, 2007). However, others were only available internally, such as, Assessment Reports, Mayoral *Lekgotla* Reports, draft policy documents, publications on water research by external partners, internal communications, flyers, maps, and posters.

Literature was also reviewed to establish the conceptual framework and theoretical underpinnings of water service delivery that are conducted globally and specifically in South Africa, including Driekoppies, since the dawn of democracy in 1994. Reviewing this literature allowed me to summarise and synthesise existing literature so that I could identify challenges and dilemmas, pick out under-researched areas, and provide opportunities to develop new perspectives. My study and literature analysis were ongoing and dynamic in this research. I constantly continued to read new documents, such as newspapers and other published articles, during this research process. Some approaches that I used to find new documents included bibliographic treeing (identifying new sources based on citations from identified articles), searching relevant academic literature and grey literature, and any other informal and formal discussion with relevant human sources who could point me in new directions.

Questions and perspectives on data collection and analysis led to inquiry on emergent concepts and topics. I used a social-ecological systems approach to guide my review (Ehrmann & Ritz, 2014). The articles that I searched for online were identified using various search engines (such as Google Scholar). The terms typed in the search engine included ‘water service delivery’, ‘water and sanitation’, ‘COVID-19 and water challenges’, and ‘climate change’. The following section discusses how I used a multi-method approach of narrative and discourse analyses, having finished the compilation and transcription of my data to help me to understand the subjective realities of individual members and leaders in the community of Driekoppies.

3.4 DATA ANALYSIS

While I was in the field, I started conducting my analysis since I did not want to wait to start after completing my fieldwork. Most of the free and quiet time I had, I read my

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diary and wrote analysis notes based on the data. This study used transcribing, coding, and embedded analysis as the main methods to analyse data.

According to Creswell and Creswell (2018), data analysis can be holistic or embedded. An embedded analysis is where various information sources are used to find the meaning of a particular finding (Yin, 2003). This method of analysis was relevant to this study because I was collecting and analysing data. For example, I combined the data that I received from official documents and interviews to describe the historical development of Driekoppies' governance system. The embedded system also provided the platform to combine artifacts with my narratives of the daily experiences of the office to generate field notes that became data for future analysis.

Transcription is essential in research because it puts data into transcripts, from which themes are extracted using a coding process before the write-up process (Creswell & Poth, 2018). Some of the recordings that I made had people using vernacular language and interjections, which required me to revise them, which was time-consuming but necessary and rewarding. Once I had completed the lengthy verification process, the formal coding process of all the transcripts started.

Coding was the critical strategy for analysing data and identifying concrete themes, and this process involved several iterations to identify succinct themes. However, I made sure to keep my research purpose in mind to avoid unnecessary coding. I opted for the manual coding process because I wanted to make sure that I was performing and following the proper process because it was a crucial stage of my research (Miles & Huberman, 1994; Bernard, 2017). I went through line-by-line of the coding of my transcripts and field notes and managed to extract key concepts and use them to form themes. The next step I performed after forming themes was to reflect on the codes so that I could explain the empirical findings, as suggested by Corbin and Strauss (2015).

Through coding, the experiences of community members were reduced into words, which generated qualitative data for analysis narrative. Following Miles and Huberman's (1994) proposition, I used several strategies to deal with these convolutions. The strategies I used included taking notes while reading transcripts and then connecting my assessment to the literature. Conversely, when I was reading the

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literature, I would also make notes that connected with my findings. Miles and Huberman (1994) shared that the researcher can even write notes on the margins of transcripts, journal articles, documents, or other literature and highlight parts of the text, which is what I did. This approach made it easier for me to generate reflections on the material that I read and classify metaphors used in the narratives. Miles and Huberman (1994) highly recommend this process of working with words. I used thematic analysis during the coding process, and the advantage is that it is not tied to a particular epistemological or theoretical perspective and can be used flexibly (Braun & Clarke, 2006).

3.5 STUDY LIMITATIONS AND CHALLENGES

One of the limitations of this study is that its nature does not allow for generalisation to other communities, even though they could be falling under the same municipality. This is because of the specific nature of the sample size, the type of methodology used, and the specific recommendations provided. Another limitation of this study is that it was only confined to a small number of respondents from which data was drawn. Employees at Nkomanzi Local Municipality who are in charge of water and sanitation and people from the Driekoppies community were interviewed. Only four visits to the municipality were undertaken for interview sessions with municipality officials, and four sessions with community members were conducted. The limitation was a result of travelling costs to Mpumalanga, as these were personally funded. However, document analysis was also conducted to ensure credibility of the research findings.

3.6 ETHICAL CONSIDERATIONS

The data required for this study entailed close interaction with people from different sectors of society, including grassroots ethics, which formed a fundamental element of the data collection process. Ethics are a fundamental component of modern-day research and, as such, require meticulous attention. According to Guillemin and Gillam (2004), qualitative research has at least two significant dimensions of ethics. There are procedural ethics, which usually involve seeking approval from a relevant ethics committee to undertake research involving humans, and the ‘ethics in practice,’ or the

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everyday ethical issues that arise in research. The general principles of research ethics include fundamental rights of human dignity, autonomy, protection, safety, maximisation of benefits, and minimisation of harm (Markham & Buchanan, 2012). I applied for and received ethical clearance from the University of Pretoria to conduct this research. Four primary ethical considerations were presented concerning this research: informed consent, privacy, confidentiality and anonymity, and ownership of data.

(i) Informed consent - All respondents were provided with full information on what the study entailed, including why they had been chosen to participate. Informed consent to explain the purpose and benefit of the research and the nature of participation was obtained verbally and in writing from all interviewees. They were then allowed up to two weeks to decide whether to participate or not. Follow-ups were performed to those who had not responded within two weeks.

(ii) Privacy - All interviews were conducted in private in places where the respondents were comfortable. All farmer interviews were conducted in their homesteads, while the key informant interviews were conducted in the key informant's offices. No challenges were faced regarding privacy.

(iii) Confidentiality and anonymity - To maintain interviewee confidentiality, I did not identify interviewee names. The names of the interviewees are only available to my supervisor and me. I did not identify names because some interviewees wanted to offer sensitive information and highlighting that everyone would remain anonymous alleviated any doubt and kept all the gathered knowledge equal. However, some respondents felt that signing consent forms and allowing audio recordings compromised anonymity; hence, they refused to sign or be audio-recorded.

(iv) Ownership of data and conclusions - All respondents were assured that all the data collected would solely be used for academic purposes. Some respondents asked for a copy of the dissertation once it was completed to assure that the study was indeed for academic purposes. Electronic documents and voice-recorded data are kept on a password-protected computer.

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3.7 CHAPTER SUMMARY

This chapter discusses how I conducted my fieldwork and the methods I used to collect data. The research design for the study is qualitative, and I explain the reasons for my choices during my time in the field. Combining interviews, observation, and document analysis was used to comprehensively address my four research questions. The approach used to analyse data and my limitations while in the field were also explained.

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CHAPTER FOUR: DRIEKOPPIES COMMUNITY WATER CHALLENGES AND RESPONSE STRATEGIES

4.1 INTRODUCTION

Access to safe water is a fundamental human right (United Nations, 2016). It is essential to human beings, the environment, and all social processes. Water constitutes a significant part of the global ecosystem, providing sustenance to the living components of the earth and modifying the non-living components (Eludoyin & Olanrewaju, 2021). The previous chapter discussed the research design and methodological approach used to fulfil the purpose and answer the research questions of this study. The reasons for choosing a qualitative research approach and the data generation methods were also outlined. The chapter is organised as follows: In the first section, I provide a profile of the Driekoppies community, and the water challenges faced by the community. The second section explains water problems in Driekoppies, which is then followed by an outline of how water was provided during the period of the COVID-19 pandemic. A section discussing the sustainability of water solutions provided by the government follows. The next section looks at non-state actors and the water problem, and the chapter ends with a summary and contribution to the whole dissertation.

4.2 DRIEKOPPIES IN MPUMALANGA PROVINCE

This section first describes the specific local context of the Driekoppies community. It is organised into two sections: the first looks at the community's profile, while the second discusses the water challenges faced by the community.

4.2.1 Profile of Driekoppies

Driekoppies community (see Figure 1) is in Nkomanzi District Municipality. It is bounded by Mozambique to the East, Swaziland to the South, Kruger National Park to the North, Umjindi Municipality to the South West, and Mbombela Municipality to the West. The notable urban centres are Louw's Creek, Kaapmuiden, Malalane, Marloth Park, Komatipoort, KaMhlushwa, Tonga, and Kamehameha. The Driekoppies area is

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located at latitude 25° 30' 8.8" South and longitude 31° 43' 48.6" East. The area covers approximately 76,485 km² comprising Nkangala, Gert Sibanda, and Ehlanzeni districts. Driekoppies has been in existence since the 1930s (Agholor & Ogujiuba, 2021).

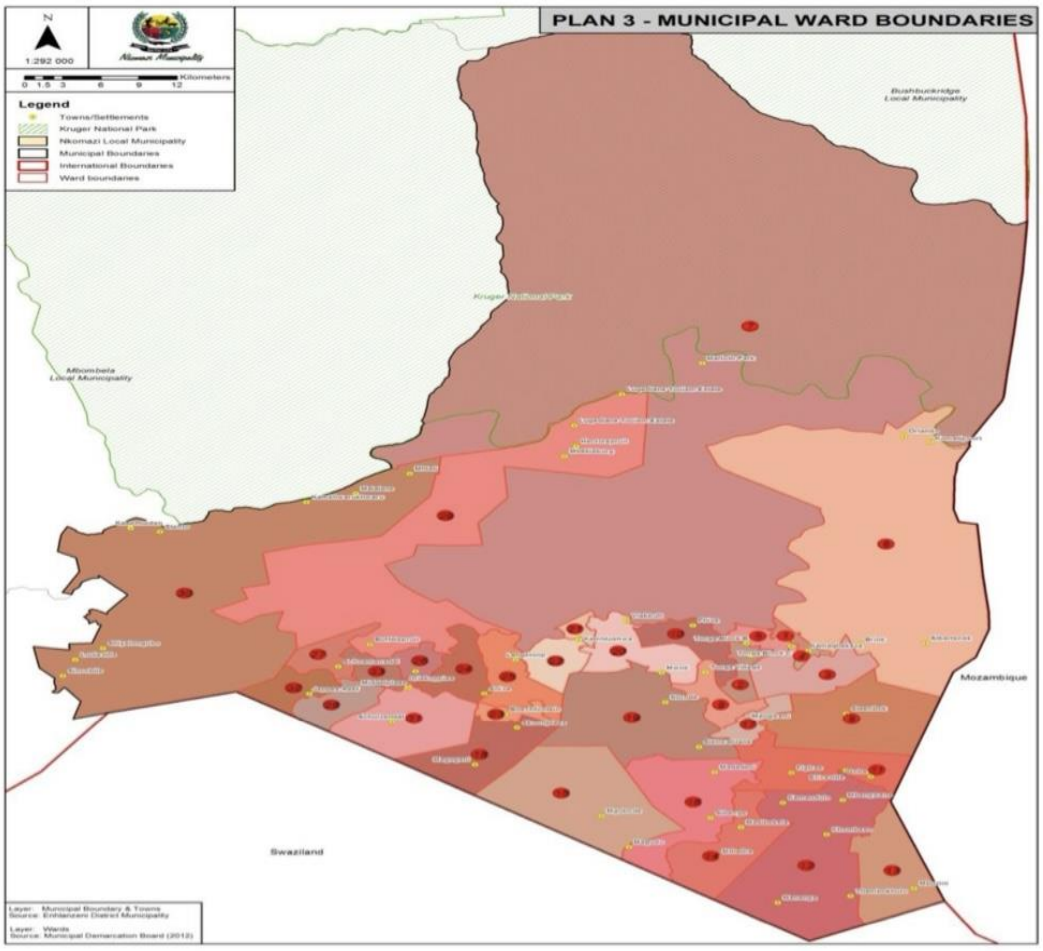

Figure 1: The Nkomazi Local Municipality Ward Boundaries.

Source: (NKLM-IDP, 2018)

The Lowveld associated with the area experiences annual temperatures of 19°C to 29°C and an average annual rainfall of 767mm, and it is notable for producing subtropical crops like maize, wheat, groundnuts, sugarcane, vegetables and citrus along with other subtropical fruits. Natural grazing covers 14% of the land area, and the primary livestock production is cattle, sheep, and poultry. Sugarcane production thrives best in the area primarily because of the economies of scale in the siting of

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Transvaal Suiker Beperk (TSB), a sugarcane processing factory. These sugar farms supply Rainbow Chicken Limited foods.

The Driekoppies Dam is the only primary water source in the whole community and Ehlanzeni district. It is a gravity / earth-fill dam on the Lomati River near Malalane, Mpumalanga. It was established in 1998. The structure of the Driekoppies Dam wall was dictated by the geological conditions. It comprises a zoned earth-fill dam with a 150 metre-long uncontrolled concrete gravity spillway section. The spillway has been profiled for an overflow of 3,900m^3 per second, based on the attenuation of the regional maximum flood hydrograph. The spillway overflow's energy dissipation is by a row of individual splitters above a continuous step (KOBWA, 2025).

Further erosion protection is provided by concrete aprons with baffle blocks immediately downstream of the spillway section. The outlet works to provide for multi-level intakes into a dual 2m diameter pipe system with downstream sleeve-valve control. The selection of the intake level is by means of butterfly valves based on water quality monitoring in the reservoir. The outlet pipe system is sized to release the estimated short-term peak downstream demand of 33 cubic metres per second with the water level in the reservoir at a very low, that is, 27m below the whole supply level, with only 1,5% of the gross storage capacity remaining (KOBWA, 2025).

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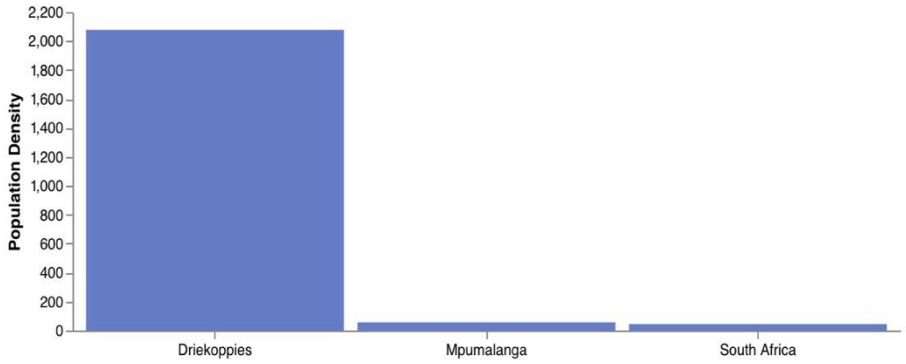

Location	Population	Area	Population Density
Driekoppies, Mpumalanga, South Africa	19,147	9.2 km²	2,077 / km²
Mpumalanga	4.3 million	76,495.3 km²	56.3 / km²

Figure 2: Population Density of Driekoppies

Source: City-Facts (2023)

The Driekoppies community consists of villages called Driekoppies A, B, Bongani, Aniva, Nhlabaville and Mbongozi. There are three high schools: Driekoppies Combined, Joseph Mathebula, and Shongwe. There are three primary schools: Magubha, Bukhosibettfu, and Sifundzekhaya. Mbongozi is a school for people with disabilities. The community has two clinics: one public and one private. The community has one stadium and two community halls (KOBWA, 2025).

Driekoppies' economy is largely based on agriculture, with sugarcane, citrus fruits, and subtropical crops being significant contributors. The presence of the Driekoppies Dam, established in 1998, plays a crucial role in irrigation supporting local farming activities. Access to water is vital for both domestic use and agriculture. However, the area faces challenges related to water scarcity and infrastructure maintenance. For instance, in November 2020, the Department of Water and Sanitation reported a decline in water levels across various dams in Mpumalanga including Driekoppies Dam, which decreased from 71.2% to 70.5%. Educational facilities such as Driekoppies Combined School, provide primary and secondary education to the local population. Access to

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quality education is essential for improving socio-economic conditions and empowering the community (KOBWA, 2025).

4.2.2 Water challenges in the community

The Driekoppies community has been facing droughts since 2005 caused by the global climate change crisis, with dams in Mpumalanga reaching all-time lows. The result of this is that the quality and cleanliness of drinking water will need concentrated effort from the municipality, which requires our municipalities to treat the water. According to DWS (2022), there is a significant shortage of Dam Safety Approved professionals in South Africa, while 66% of the existing ones are over 60 years of age. In addition, the austerity and the debt crisis in South Africa put the availability of clean water in a precarious condition; because of that, the situation does not look like it will improve anytime soon.

Residents in Driekoppies have complained and raised concerns to government and municipal authorities about their water system's poor quality and deteriorating condition for several years. The tap water only comes on intermittently, and people become sick from drinking it even after boiling it. The health implications of this are severe, with cases of waterborne diseases on the rise. People in the community are forced to rely on roaming water tankers to collect water in buckets to drink, cook, wash clothes, and bathe. Zothile, who lives with five other relatives and is unemployed after losing her job at the local supermarket three years ago, now relies on her three children's social grants to survive, sometimes spending R300 a month to fill up a 5,000-litre water tank. To make the water that they buy last longer, the family uses a pit toilet instead of their flush toilet. For a period of months, she cannot afford to buy water from vendors; they are forced to cart containers in wheelbarrows to and from the communal borehole about five kilometres away.

Women are primary providers, users, and managers of water in the households, and they are often directly affected by a lack of sanitation facilities. In Mbongozi, most people’s lives, especially women and girls, now revolve around finding water and preserving their supply. Most households in that village are poor and need large tanks

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or containers to store water. At their houses, water comes out of the taps for only a couple of hours a day, usually in the middle of the night. In cases where the water does not come out of the taps for several days, there is a disproportionate burden on women and girls to collect water from the community borehole. These women and girls travel long, onerous distances and sometimes at night without well-lit infrastructure for protection and peace of mind, as some of these women and girls have to be at work and in school during the day. The lack of access to water in the village is invariably a gendered issue because it renders women and girls vulnerable to gender-based violence and other human rights violations. The challenge of water in the village emerged in a conversation with Zinhle, as highlighted below:

> *There is water apartheid here. You can easily miss it if you are asleep and do not hear it. The council sends out water tankers, but we do not know when they are coming. Sometimes, they come while you are out doing piece jobs, and once you fail to get the water from the tankers, you will have to go to the community borehole, which is far away* (Zinhle, Interview, Driekoppies, 22 June 2023).

In Aniva village, the only reliable water source is a small pond and a stream that villagers share with their cattle. For almost fifteen years, the residents of this village have struggled to find a consistent water supply from the municipality. In some sections of the village, people had not seen a drop of water from their taps for three weeks, as they had been told that the tankers had broken down. Mr Mashiane, a municipal official, acknowledged water supply disruptions to high-lying areas such as Malalane and also shared that the problem was exacerbated when torrential rains in December last year washed away the bulk water pipeline that supplied water to the community. He further shared that the municipality sends water tankers to several areas in Driekoppies as a short-term solution, but some residents say that the supply is irregular. Mr Skhosana, a resident of Malalane village, who is one of the few people with a storage tank in their household, explained:

> *The municipality provides water, which we store in a tank. However, the tank is not enough for my family, as it runs out before the end of every month. We use this water for drinking, cooking, and washing clothes. Sometimes, we also share*

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with neighbours who do not have tanks because we are a family in this community and believe in Ubuntu. (Mr Sikhosana, Interview, Driekoppies, 22 June 2023).

The research found that as a temporary solution, the Nkomanzi Local Municipality had installed four boreholes, and supplies to affected villages would be supplemented by water tankers. However, the water problems in most villages in Driekoppies had not improved because of boreholes drying up or breaking down. Water from these boreholes is not only used for drinking; people who run car-wash businesses and some who are building also rely on them, which puts a further strain on the boreholes' capacity, leading to them drying up.

A case in point that shows how water scarcity threatens the Driekoppies community is when households reported that sometime around 2020, their tap water became contaminated and was not even safe for bathing. Many people, especially children, developed an itching rash, which hospital nurses told them was caused by the contaminated municipal water. When asked, municipal authorities highlighted that the causes of contamination in the water resulted from sewage spillages that flowed into the rivers and dams that fed the water supply into the Driekoppies community.

The situation in Driekoppies, where many residents, particularly children, developed an itching rash attributed to contaminated municipal water, highlights critical issues of water quality and public health in the area. These rashes were commonly linked to waterborne diseases or irritants found in the contaminated water, which can cause skin conditions such as rashes, eczema, or other dermatological issues. The hospital nurses who diagnosed the issue were likely referring to common ailments, such as bacterial infections or parasites that thrive in untreated or improperly managed water sources or are associated with polluted water. The local municipal authorities acknowledged that the water contamination stemmed from sewage spillages that flowed into nearby rivers and dams. This indicates a serious public health and environmental hazard, as raw sewage contains harmful bacteria, viruses, and pathogens, which can cause a range of illnesses, from mild skin infections to more severe conditions like cholera, dysentery, or typhoid. Sewage runoff from malfunctioning sewage systems or improper waste disposal often enters water sources, leading to polluted drinking water. Once in the water supply, these

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contaminants spread throughout the community, affecting the health of residents who rely on this water for drinking, bathing, and cooking.

Rivers and dams that feed the water supply in Driekoppies are directly impacted by sewage contamination, leading to a vicious cycle where the water is unsafe for consumption, further exacerbating the health risks for the population. The contamination also affects aquatic ecosystems, which rely on clean water to maintain biodiversity. Furthermore, the inability of the local municipality to address and prevent these spills is indicative of broader infrastructure failures and governance challenges within the water management system. Limited maintenance and lack of investment in sanitation infrastructure are contributing to the problem, leaving communities exposed to health risks and undermining their ability to access safe drinking water.

Mrs Ndiweni shared her experience when she said:

> *It's by God's grace that my last born is still alive. She had a serious rash after I used water from the river to bath her. Her whole skin was peeling off and she would constantly scratch herself day and night. It is so scary to see your child go through that but you can't offer any help.*

An inquiry by the South African Human Rights Commission (SAHRC) came after protests and complaints against the municipality, and it was ordered to comply with national water provisions within 90 days of the report's release. This also included providing minimum potable water of 25 litres per person daily or six kilolitres per household monthly.

The research also found that the Driekoppies community clinic, which is expected to have a reliable and consistent water supply to maintain hygiene standards, is also not spared when it comes to water challenges and lack of running water. Several times, the crippling water shortages have led to people bringing their hospitalised family members or relatives water for bathing in 20-litre buckets bought from vendors for R4. This is unaffordable for most households because they are unemployed and rely on the social grants that they receive from the government. An official at the clinic said that since 2018, they have only had running water three times a week and then often

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only for two to three hours at a time, making sanitation and disease control issues difficult and their working conditions unbearable. Ms Mtsweni shared her dissatisfaction and complained:

> *I know our pledge and calling are to look after people, but I think it becomes impossible to fulfil this pledge when you are working under the current conditions. I expect the municipality to at least provide water so that our work is easy, but it has been several years without consistent water at this clinic. I don't feel motivated anymore*. (Ms Mtsweni, Interview, Driekoppies, 22 June 2023).

Without safe drinking water and adequate hygiene and sanitation facilities at the clinic, it is extremely difficult for patients, especially women and girls, to be safe because they will be unable to practice safe sanitation for menstruation. Nkomanzi Local Municipality has promised to prioritise water supply and provision at the local clinic and the Driekoppies community, but the situation has not changed several years later. Below are explanations of water problems in Driekoppies.

4.3 EXPLANATION OF WATER PROBLEMS IN DRIEKOPPIES

This section provides an explanation of water in Driekoppies. The challenge of water is attributed to construction mafias, ageing and vandalism of infrastructure, climate change, and a lack of skills and competency. These factors are discussed below.

4.3.1 Construction mafias

One of the reasons that there is a water shortage in Driekoppies is the proliferation of construction mafia holding water projects hostage in the community, leaving community members with dry taps. According to the State Investigating Unit (SIU), ‘construction mafia’ is a loose phrase that refers to a group of community members, business owners, and, in some cases, thugs who demand protection fees or extort money from construction companies in exchange for allowing service delivery projects to continue unhindered. In Driekoppies, the mafia came overnight to destroy pipes laid in trenches and demanded to have their relatives be employed on a water project in that community.

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A case of how the construction mafia came to Driekoppies was shared by one resident who said that a group of about 20 people invaded a water project site on 22 August 2018, demanding that they be given the contract for security reasons and be offered jobs, or the site would be shut down. They also threatened employees and the site manager while some were vandalising infrastructure such as ground pipes. The group returned the next day, instilling fear in workers and the community. The construction mafia brought disruption and delayed the project which had been launched in 2016 to alleviate water shortages. However, it now remains incomplete to date, with some structures already in a state of dilapidation. This systemic extortion has been fuelled by the weak response from the state, which allows the mafia to expand their activities. The mafia mainly consists of unemployed youth who feel that they are sidelined in the process of community development.

An official at Nkomanzi District Municipality shared that one of the biggest challenges to delivering water services was mafias that hold projects hostage and demand 30% payment without performing any work. The Driekoppies community and construction company responsible for laying the new pipes sought several times to curb the activities of the construction mafia by turning to courts. That has not had the desired effect and has had little effect on them. The community leaders have appealed to the government to act decisively in addressing the construction mafia, with limited success. The research found clear links between some construction mafia groups who act as surrogates for certain politicians in Mpumalanga province.

4.3.2 Ageing and vandalism of infrastructure

With over half of its water supply infrastructure old and crumbling, an ageing water system is one of the reasons why there are water problems in the Driekoppies community. According to the Global Water Forum (Gabel, 2024), an ageing water system typically involves deteriorating infrastructure, which includes old pipes, outdated treatment facilities, and inefficient technology. In addition, the existing ageing water infrastructure is insufficient to meet household demand and other requirements such as gardening, car washing businesses, and building.

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While walking around the Driekoppies community, I observed fresh drinking water leaking from water infrastructure, while Nkomanzi Local Municipality failed to meet their community's demand for clean water. An official from the municipality attributed the water leakage to aged infrastructure (60% asbestos pipes), especially pipes that were laid between 1920 and 1940, which can no longer cope with the demand, especially in the fast-growing community. The community has grown over the years, and the bulk water supply infrastructure has not been upgraded. The risks and consequences of neglecting these ageing water systems extend beyond mere water wastage. Common issues with these systems include frequent leaks, contamination of water supplies, and general inefficiency in water management. In Driekoppies, where the population is growing fast, and the demand for clean water is continuous, the failure to update and maintain water infrastructure can lead to significant health and safety hazards. Contaminated water supplies can result in widespread public health crises.

Most of the officials at Nkomanzi Local Municipality revealed that there is a concerted effort from a syndicate of people who are sabotaging the system, even those who are providing the service, who supply the municipality with the valves and other materials, who come and damage the system. These people know that if the system is sabotaged, the municipality will rely on them for repairs. The problem is not easy for the municipality to solve because they lack enough people with skills for operations and maintenance of existing infrastructure. Besides vandalism from syndicates that work closely with the municipality, damage to existing infrastructure comes mostly from an influx of people occupying land illegally and drilling into pipes and installing illegal connections, resulting in excessive water distribution losses in Driekoppies. One official who has worked in the maintenance department at the municipality for more than twenty years and has seen the rise in cases of vandalism of water pipes shared:

> *When I started working at the municipality in 2004, I didn't remember being inundated with reports of pipe vandalism like what is happening these days. A week does not pass without being called to repair vandalized pipes, and we often do repairs on illegal connections. Most of the illegal connections are done by people who live in informal settlements, and this will not end any time soon as*

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long as we have such settlements. (Mr Ngobeni, Interview, Driekoppies, 25 June 2023).

To address the challenge of ageing and vandalism of infrastructure, my interview with the municipality officials revealed that various funding models and financial strategies are being developed and implemented through the national government to support the upgrading of water systems, which is crucial for Driekoppies looking to enhance its infrastructure. Public-private partnerships leverage private sector expertise and funding, while government grants provide direct financial support for specific projects. Additionally, green bonds are emerging as a popular method to raise funds for environmentally friendly water infrastructure projects. Investing in improved water systems leads to significant cost savings by reducing water loss and energy consumption, boosting property values, and enhancing the overall economic health of a community.

The research found that besides implementing a funding model, the municipality is using modern technology and innovative practices that effect a significant shift in the current way of revitalising ageing water systems, aligning them with ambitious urban development goals. The municipality is currently rolling out technologies such as smart water meters, which provide real-time data on water usage, help identify inefficiencies and reduce wastage. The municipality also uses leak detection systems that utilise advanced sensors to detect and pinpoint leaks in the water network. It enables timely repairs that minimise water loss and prevent more considerable infrastructural damages.

The municipal officials shared that they were piloting an interesting application of modern technology, which is evident in flow meters in sewerage systems that are being used in urban areas in Driekoppies. These devices can monitor sewage flow rates and compare them with rainfall data to identify rainwater entry points into sewers. This is a common issue in older systems that leads to overflows and pollution. Addressing these points can significantly reduce the incidence of untreated sewage discharges during storms, which is crucial for maintaining water quality in Driekoppies. By fixing infrastructure and improving sewage treatment systems especially during storm

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events, the community can ensure cleaner and safer water, reducing health risks associated with contaminated water.

4.3.3 Climate change-driven water scarcity

According to Good Governance Africa, climate change can deleteriously affect water quantity and quality. The effects of extreme weather events on water availability, predictability, and pollution are increasing, threatening sustainable development, biodiversity, and access to water and sanitation (Maluleke, 2023). In addition to contaminating land and water resources, flooding and rising sea levels can damage water and sanitation infrastructure, such as water points, wells, toilets, and wastewater treatment plans. Climate change is likely to increase water demand while shrinking water supplies.

Water scarcity and quality in the Driekoppies community are influenced by the effects of climate change. The municipality of Nkomanzi is heavily reliant on rainwater for its water supply to communities. However, the unpredictability and irregular patterns with reduced and uneven rainfall distribution have resulted in low water levels in the Driekoppies Dam, the primary water source for the Driekoppies community. Tributary rivers that flow into Driekoppies Dam run dry as soon as the summer season is over because of the extended periods of drought. A municipality official shared that the first time that the Driekoppies Dam ran very low was around 2017/18 because of the drought. Since 2020, reservoirs continuously run dry because of the water purification plant's capacity not being enough to meet the daily water demand. This resulted in poor water quality and sediment in the pipe network with the constant opening and closing of the network. When the dam levels are low and reservoirs run dry, the municipality will embark on water rationing and restrictions to reduce water consumption. The municipality has also started the installation of restrictors in water meters and pressure-reduction measures in the reticulation network.

One of the effects of climate change is occasional flooding that is caused by heavy rains. Over the past few years, when floods occur in Driekoppies and the surrounding areas, a tremendous amount of waste, primarily plastic, is deposited into the

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Driekoppies Dam. While driving through Nkomazi district, one of the things quite evident is that the area is heavily polluted with the once-use disposable nappies. Household waste management is very poor, and illegal dumping is everywhere along the road and at illegal dumping sites and bridges. The result is that this compromises water quality. In trying to address this challenge, last year in May, the Nkomazi Local Municipality's Community Services Department embarked on a major clean-up campaign of Driekoppies Dam in partnership with the Komati Basin Water Authority (KOBWA) and the South African Police Service (SAPS) Inland Water Policing and Diving Division. This is an operation that takes place bi-weekly. The waste, usually from illegal dumping and pollution, affects water quality, fills the dam with debris, and reduces capacity.

After each flooding event, the poor water quality and the waste accumulating in the Driekoppies Dam have forced the Nkomanzi Local Municipality to close the dam for cleaning. This closure leads to long queues of people from the Driekoppies community waiting for hours to receive water delivered by tankers. Some days, the tankers do not arrive as promised, leaving most older adults and children to walk long distances to fetch water from boreholes. In areas where the boreholes have broken down, residents have to rely on water vendors, who charge about R4 per 20-litre container and R500 to fill up a tank. One elderly woman, who is in her early seventies and takes care of six grandchildren, all of whom are orphans, shared how the situation of low water levels and occasional dam closures have affected her daily life.

> *The municipality closes the dam without warning, and we wake up without water on our taps. Whether the dam is going through cleaning or not, we have never had consistent water flowing from our taps. Throughout our lives, we are forced to rely on water from tankers or water traders who profit at the expense of us people experiencing poverty with already strained financial resources. Those who can afford to buy water tanks for their homes, which they fill through purchases from water traders.* (Mrs Moabi, Interview, Driekoppies, 5 September 2023).

The research found that several areas in the Nkomanzi Local Municipality, including Driekoppies, Langeloop and Middleplaas, struggle with severe water shortages

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despite the municipality's efforts to build a water reservoir project at Driekoppies Dam. According to the local councillor, residents had expected the dam's reservoir construction to resolve their water issues, but the situation has not yet changed because of the climate change challenge. He explained:

> *There has not been any rainfall, and the rivers are slowly running dry, but we are trying our best as a municipality to ensure that the community water tanks are always full. A number of our villages still receive potable water. Furthermore, due to service providers' non-payment, the plants occasionally run out of chemicals, making it extremely difficult for municipal workers to provide excellent and proper service.* (Mr Tau, Interview, Driekoppies, 6 September 2023).

The residents of the Driekoppies community are not just statistics in a report; they are real people experiencing the devastating effects of climate change. The decline in water quality and scarcity is not just a problem on paper; it is a daily struggle for these individuals. Population growth and rapid urbanisation are not just abstract concepts but factors exacerbating the community's water issues. The audience, comprising policymakers, local government officials, NGOs, and community leaders should feel a sense of empathy and urgency to address these challenges. This means that those in positions of power and influence must not only understand the problem but also feel an emotional drive to act quickly and decisively in order to improve water quality and sanitation and reduce health risks for the affected population.

4.3.4 Lack of skills and competency

According to the Department of Water Affairs' National Water Resource Strategy (NWRS) of 2013, the country needs professionals in the water sector. Then, it needs about 3,000 engineers (at a 57% vacancy rate) and 7,200 health and hygiene / environmental health practitioners (Munzhedzi & Phago, 2020). It also had vacancies for 23,000 management staff and 4,000 artisans and technicians. Discussions with officials revealed that Nkomanzi Local Municipality, responsible for water provision to the Driekoppies community, has difficulties attracting and retaining skilled personnel

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from engineering, science, technical, and artisan areas, and these are classified as critical skills in the water management sector. This is primarily attributed to an insufficient skills base and fierce competition for these skilled personnel in the sector.

The municipality has also been experiencing considerable losses in institutional memory as a result of high rates of retirement in recent years. Besides that, the lack of skills in the municipality continues to be a challenge because of political appointments, corruption, and mismanagement. Several people employed to lead and oversee water provision projects do not possess the necessary qualifications, leading to the projects failing to commence or finish. Several water projects in the Driekoppies community are unfinished or have yet to commence because of skills shortages. An official from the municipality lamented the skills shortage when he said:

> *With Driekoppies facing massive water problems, the municipality urgently needs highly skilled professionals in the water sector. Skills and capacity building are central to any and all strategies and businesses, and the water sector is no different. To address the growing water challenges that plague our district, skills collaboration will be needed. Failure to address this will result in the whole district experiencing day zero, like what almost happened in Cape Town.* (Mr Manoto, Interview, Driekoppies, 6 September 2023).

Overall, the officials believe that addressing these trends and challenges will require a collaborative effort from national, provincial, and local government, the private sector, and civil society to address the challenge of skills shortage, political appointments, and corruption. It further requires bold and effective leadership at all levels of government and parliament because as water resources become increasingly scarce, there is a need for more effective administrative and political institutions for water planning, development, and management. Failure to arrest this situation is a recipe for disaster for the government because, unlike electricity, there is no alternative to water.

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4.4 WATER PROVISION DURING THE COVID-19 PANDEMIC

The government of South Africa dedicated funds for water to help fight COVID-19. Of the R500 billion budget allocated to respond to the pandemic's gaping economic and social effects, R20 billion was set aside for municipalities to provide emergency water supplies, amongst other urgent needs. The Department of Water and Sanitation embarked on a massive rollout programme to help out struggling municipalities such as Nkomanzi with water provision. When the COVID-19 pandemic broke out, Ms Mtsweni-Tsipane, the Premier of Mpumalanga, said, "That is a genuine concern raised by our community as we all know that we are a scarce province as Mpumalanga, but we could sit back and fold our arms. We then devised intervention strategies to provide sufficient water within this area."

In the Driekoppies community, water tanks were installed in many sections as an intervention strategy, mainly targeting the critical areas where water was a problem. The government, and water tankers, distributed and filled the public water tanks, ensuring that people would no longer travel long distances to fetch water. Driekoppies community was provided with three 10,000 litre water storage tanks as part of the government's efforts to ensure that the community had access to water and curb the spread of COVID-19 through the regular washing of hands. However, in some areas, there had been a lag in the distribution of tanks, but it was quickly addressed. This was because, for a tank to be of use, it needed to be mounted on a platform. The provision of the platforms was the role of municipalities, which faced challenges in accessing the cement and bricks needed to mount and fix the tanks in position because hardware shops were closed. All supplies from hardware stores had dried up, which caused delays. The Minister of Trade and Industry was approached to declare hardware stores essential services selling essential goods. The opening of hardware stores was allowed, and the rollout of water tanks continued.

The government also established three boreholes as an intervention strategy and a temporary relief for water provision during the COVID-19 pandemic. The Department of Water and Sanitation would reiterate its call to the public to use the available water wisely, sparingly, and conservatively, as every drop of water counted during the COVID-19 pandemic. "We are rolling out a temporary relief to all the municipalities

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under stress that need to be supported. The temporary relief we are giving in several municipalities is that we provide storage tanks for communities that do not have water. It is stored in the storage tanks. The same thing we are doing with the province of Mpumalanga is that we are also providing water cutting, which is called the water trucks. They are being distributed all over the country through the Minister."

Even though the government established boreholes and water tanks during the COVID-19 pandemic, one of the most significant setbacks was that the community did not take ownership of the infrastructure and protect it from vandalism. The research found that much of the infrastructure vandalism occurred in informal settlements. As soon as the boreholes were set up, two boreholes and one water tank were vandalised in two months. Consequently, women in the community had to bear the brunt of walking long distances to provide water for their families during the COVID-19 pandemic. The necessity of travelling to fetch water from water points made it very hard to practice physical distancing or self-isolation in Driekoppies. They did not have the luxury of turning on a tap to prevent the threat or transmission of COVID-19, as they were forced to queue at the single borehole that remained functional. In other parts of the community, water tanks would run out of water, and at the remaining water point, women would wait for an entire day to fill a 20-litre bucket.

The effects of the pandemic were an added struggle to an already heavy burden for women. The lockdown restricted the movement of women, whom police would turn away after walking a long distance when they tried to collect water from boreholes or water tanks. Some women would wait until it became dark to collect water so that the police would not see them. One community leader, who is passionate about human rights and gender equality, shared his thoughts on the issue of service delivery and water provision during the COVID-19 pandemic and said:

> *It is a disturbing irony that during this pandemic, the government advised that water is essential to curbing the contraction of the disease. The plight of poor communities across Driekoppies without a regular water supply has exposed the fault lines and legacy of skewed spatial planning and inefficient government delivery of essential services and infrastructure*. (Mr Sakhile, Interview, Driekoppies, 15 September 2023).

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A woman who worked for the private sector and has since retired but relocated to Driekoppies, shared her thoughts when she said:

> *After thirty years of democracy, what does our freedom mean if our people, especially women, are still bereft of dignity and without access to basic needs like water? COVID-19 was the great leveller from which we were all supposed to chart a new course. The voices of women must be front and centre of this effort*. (Mrs Matsatsi, Interview, Driekoppies, 15 September 2023).

A community leader shared how nine leaders and himself who form a community organisation, *Ntaba Yethu*, and members of the social movement, *Inyanda*, were arrested on charges of convening an illegal gathering in terms of the COVID-19 regulations, when they met to discuss the water challenges during the COVID-19 pandemic. They had met to discuss ways to urgently engage the government on how they could intervene in the boreholes and water tanks that had been vandalised. In addition, they wanted a guarantee for protecting and fulfilling their fundamental constitutional rights to address the COVID-19 crisis and provide sustainable access to water beyond the crisis. The community leader explained:

> *In Driekoppies, after the vandalism of the government infrastructure that was established, community members, mainly women, had to walk kilometres or stand in long queues for a day when there was water available to obtain access to water. Households would buy water for R500 (2500 litres) or R4 (20 litres). This was unaffordable for most households. These residents continued to experience a daily violation of their guaranteed rights enshrined in sections 24 and 27 of the Constitution*. (Mr Bongani, Interview, Driekoppies, 15 September 2023).

Emma Hlatshwayo shared this regarding the issue of COVID-19 and water provision:

> *We are unemployed and living in poor conditions with no access to housing, water, or sanitation. When COVID-19 came, we understood that we were not the government's priority because we had to face different kinds of problems*

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> *independently. When I wake up in the morning, I do not look forward to starting a new day*. (Mrs Emma Hlatshwayo, Interview, Driekoppies, 15 September 2023).

While moving into the community of Driekoppies with one of the leaders, I saw the water tank and boreholes established during the COVID-19 period vandalised, and they are yet to be repaired. For many people in the community, reaching the rivers early in the morning to fetch water before the animals do is still a daily reality, exposing them to illnesses such as cholera and diarrhoea. Several civil society organisations have carried out advocacy and activism for the municipality to address the situation. However, the government has failed to respond earnestly and substantively to its mandate; the responsibility all too often falls solely on the tired shoulders of the NGOs.

4.5 SUSTAINABILITY OF WATER SOLUTIONS PROVIDED BY GOVERNMENT

This section discusses whether the measures adopted by the government during the COVID-19 period were sustainable to ensure water access to Driekoppies. The second part discusses what the community views as a sustainable solution to their water problems.

4.5.1 Sustainability of boreholes and water tanks to ensure water access

The South African government established boreholes in the Driekoppies community to mitigate water scarcity and provide clean drinking water during the COVID-19 pandemic. Even though boreholes helped to improve water availability, there are challenges if this is to be considered a permanent solution. Because of climate change-induced droughts, water sources from boreholes dry up rapidly because of climate variability and uncontrolled human activities. Water accessibility depends on prevailing climatic conditions. Households become vulnerable in accessing domestic water during these unstable climate conditions. For example, in 2018, the South African Broadcasting Corporation (SABC) reported that Mpumalanga is one of the provinces where dry conditions are prevalent, and water levels had dropped

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at significant dams, and rivers dried up while dam levels dropped drastically (Magwaka, 2018).

In their 2013 study, Bezuidenhout and the North-West University Team (2013) indicated the risks of drinking water from boreholes that do not always provide safe water and contain bacteria and chemical contaminants in the North West province of South Africa. Similarly, Driekoppies community waste management is very poor, and illegal dumping is everywhere, which can lead to borehole water contamination and the emergence of communicable disease outbreaks related to water. A community leader of Driekoppies who was not convinced by the sustainability of boreholes as a solution to water challenges in the community said:

> *I have seen the boreholes that were set up in this community. The challenge with them is that they are drying up. There is a lack of maintenance, and their overuse makes them challenging to operate. They must supplement water from taps and not be our primary water source*. (Mrs Mthembu, Interview, Driekoppies, 20 September 2023).

Besides sinking boreholes to provide water for the community, the government also set up water trucks filled with water. The lack of consistency in filling up the tanks by the municipal water trucks after they run out of water renders this solution not sustainable for the community. People will be forced to find other alternatives, such as fetching water from rivers, where domestic animals like cattle, goats, and donkeys drink, exposing them to communicable diseases. Besides the lack of consistency in filling up the water tanks, this solution is not sustainable because it is expensive for the government in the long run, and breeds corruption. An official from Nkomanzi Local Municipality shared his views on the sustainability of providing water in tanks, when he said:

> *The biggest challenge in the department is that we have budget cuts from the National Treasury almost every year. To think we can sustain water provision in Driekoppies by sending water trucks to fill up water tanks is impossible. Our budget is not bottomless. We need to work with citizens to improve water management by sharing information on the state of our services and natural*

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> *resources and mobilizing local action to address local problems*. (Mr Sibanyoni, Interview, Driekoppies, 22 September 2023).

The research found that before the COVID-19 pandemic, Driekoppies' households did not have access to reliable drinking water because of dilapidated infrastructure and a lack of proper operations and maintenance of existing infrastructure. This resulted in disruptions and a shortage of water supply. The situation did not change, even during the pandemic, when the government established boreholes and water tanks in the community, indicating that the solution did not address water challenges in the area.

4.5.2 Community views of sustainable solutions on water access

Despite the ongoing water shortages, the households in Driekoppies have shown remarkable resilience. They have adopted various strategies and practices, such as reusing water, drinking river water, and storing water in buckets and drums, to cope with the situation. Most households believe that the establishment of boreholes and water tanks is a short-term solution, and they are actively seeking more sustainable alternatives.

One of the solutions that households believe will be sustainable in addressing the water challenges in their community is to recognise informal settlements in the area so that they access services such as water provision, because the principle of equity in water management implies justice and fairness. It seeks to balance equity, efficiency and the environment, fulfilling economic and social values. Once informal settlements are included in water provision and infrastructure is provided, it will help to curb the problem of illegal water connections and vandalism. The households argued that if the formal settlements had the infrastructure and the informal settlements did not, there would be a sense of neglect and jealousy. When this happens, people from informal settlements will destroy the infrastructure so that the situation is the same for the whole community. Mr Manoto, who relocated to Driekoppies twenty years ago and initially built a shack in the informal settlement but later bought his place in the formal settlement, shared:

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> *When I first came to this place, I used to stay in a shack, and we found it unfair that the government's focus was only on formal settlements and that we would be ignored. That made us feel like we were second-class citizens, and we tried by all means to sabotage the projects happening in the formal settlements. Now that I am staying in the formal settlement, I have realized it is wrong, and the only way to solve this is to include people from informal settlements in every development happening in this community*. (Mr Sibanyoni, Interview, Driekoppies, 22 September 2023).

Rainwater harvesting is another solution that households in Driekoppies regard as capable of solving water challenges in their community. Collecting rainwater for drinking can reduce a community's reliance on other water sources, such as boreholes and water tanks. Households pointed out that because of a lack of resources and finances, the government should provide everything required so that there is proper design and maintenance to prevent water contamination. Mr Moabi, who is a retired civil servant and finds it hard to walk the long distances to water sources in the community, explained:

> *The government should install JoJo tanks in every household that collects water from our roofs. It is sad that during the rainy season, water is not harvested from our roofs but goes to the ground and flows away. This can solve the water problem for people like me. I will not struggle with walking to water tanks or the boreholes*. (Mr Moabi, Interview, Driekoppies, 24 September 2023).

This practice is common in rural areas, where some communities lack proper infrastructure, such as water pipes that supply water to homes.

4.6. NON-STATE ACTORS AND THE WATER PROBLEM

The COVID-19 pandemic placed a magnifying glass on pre-existing environmental and social challenges in South Africa, highlighting flaws in government policy and humanitarian services. In Driekoppies, community NGOs, churches, and private institutions put many resources into addressing the pandemic. Below is a discussion of the different roles that they played in water provision.

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4.6.1 Role of the church in water provision

In a world of social injustice, economic inequity, environmental degradation, conflict, and human rights violations, the church's role has become more critical in addressing these challenges. The church has a unique and vital role in proclaiming water as a sacred gift from God and working with communities to ensure safe, affordable water is available to all of God's children. The church in the Driekoppies community plays a significant role in water provision for people, because attending to their physical and spiritual needs is essential.

The water scarcity in Driekoppies is a severe problem and heavily affects women and girls who walk long distances and stand in line for hours to fetch one bucket of water. In many cases, girls are forced to abandon school to guarantee water for the family. The local church dug a borehole on its premises, and community members come and fetch water every day. Every two weeks, Makhaza Ntuli, a community leader in Nhlabaville, borrows his brother's *bakkie* to load containers to fetch clean drinking water from a church's borehole three kilometres from his house. Ntuli lives with his elderly mother and teenage son. They do not use the discoloured municipal water from the tap for drinking or cooking; they reserve it for laundry and bathing only. Sharing his story, he said:

> *We do not have clean water; therefore, we must survive on water that we ask for from the churches far away. We do not pay a single cent for the water; they have helped and uplifted this community through their kind gesture. Many people find it scary to take on the government. However, we pay for municipal services, so it is not as if they are doing us a favour. We are not talking about burning tires or buildings but taking away the money and seeing how fast they move*. (Makhaza Ntuli, Interview, Driekoppies, 24 September 2023).

Discussions with the community leader revealed that the church already has a court order compelling the municipality to provide clean and safe drinking water. The church

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is at the forefront because people are afraid of victimisation and lack financial resources, but they have been supporting the court order.

4.6.2 Role of non-governmental organisations in water provision

One of the most essential preventive measures that the World Health Organization (WHO) recommends to avoid the transmission of the COVID-19 virus is for people to wash and sanitise their hands constantly (WHO, 2020a). Despite this, many people in Driekoppies, especially those in informal settlements, were amongst the high-risk communities because they did not have reliable, clean water sources. Responding to the COVID-19 crisis, NGOs mobilised teams and resources in response to the pandemic to procure supplies for infection prevention and control and work closely with governments to guide communities and healthcare providers.

The Gift of the Givers Foundation is the most significant disaster response NGO of African origin on the African continent. On 15 July 2020, the organisation installed *JoJo* tanks in the Driekoppies community, which had been stranded without a water source for days. Aniva community was one of the beneficiaries, and as soon as the NGO had put up the tankers, residents appeared on site to fill their buckets and containers. The Gift of the Givers gave the community 34,000 litres of water in just one day. A resident of one of the informal resettlements who was overwhelmed by the Gift of the Givers' gestures, shared:

> *The NGO's response to the COVID-19 crisis in our area was swift and commendable. If they had not been quick, a severe disaster would have happened, and people would have died in large numbers. On the other hand, our government's response to COVID-19 was slow, and we felt like they did not care much, which is sad*. (Ms Zothile, Interview, Driekoppies, 24 September 2023).

The NGOs continue their work of improving water provision to this day because they are still actively searching for partnerships with the private sector and government to work together. They have been helping water utilities to deliver clean and reliable

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water, providing sanitation to those who need it most, and promoting hand washing behaviour change – these actions can help protect people in the short term and help prevent further outbreaks in the coming years from causing too much damage. In addition, the Gift of the Givers has been involved in helping the government to formulate a water provision policy targeting informal settlements in poor rural areas.

4.6.3 Private sector and water provision

Private entities play a significant role in health globally. They are determined to make clean water, reliable toilets, and good hygiene normal for everyone everywhere within a generation. However, in the Driekoppies community, their contribution has not been fully optimised to strengthen the delivery of water provision. The COVID-19 pandemic overwhelmed health systems and precipitated coalitions between public and private sectors to address critical gaps, especially in water provision. The private sector played a role in providing water at Driekoppies clinic. Before their intervention, the clinic had water shortages, contributing to an unsanitary and unhygienic environment. The place could not be adequately sanitised because of the lack of water and the lack of cleaning supplies, which increased the health risk for healthcare workers, patients, and consequently, their families, communities, and the general public.

The business community in South Africa has been playing a role in water provision, especially in the most densely populated informal settlements in Driekoppies. Water is also being supplied and stored in water tanks through the work of the Department of Water and Sanitation. In addition, when the COVID-19 pandemic began, the National Business Initiative (NBI) and Business for South Africa (B4SA) deployed a hand-washing programme to combat the virus in the Ekurhuleni Municipality in Gauteng. The NBI and B4SA, working with the Nkomanzi Local Municipality, quickly assembled a team of engineers, scientists, water experts, and project managers to design a foot-operated communal tap (as opposed to a hand-operated one), a hygienic hand-washing facility at communal sites and an affordable hand-washing unit for inside homes, which uses a two-litre plastic bottle design.

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Initiatives by the private sector in the community demonstrated the critical need for multi-stakeholder responses to COVID-19 and water provision. They also hold potential lessons for responding to the climate crisis and how private sector action and innovations can be supported. Business groupings like the NBI and B4SA facilitate rapid collective action from the private sector and enable disaster responses across different stakeholder groups. The pandemic confirmed that leadership and collaboration - of both public and private actors - are both essential to bring about rapid and decisive action for the provision of services such as water to communities.

4.7 Chapter summary

This chapter investigated the water challenges in Driekoppies. The chapter started by providing an outline of the Driekoppies area, which is essential when investigating COVID-19 and water delivery challenges since it presents the area's political history and the people's socio-economic status. This also helps to provide some insight into similar locations, but most importantly, the research questions central to this study will be answered. The findings indicate that the municipality's consistent water safety provision is still challenging. Sickness, such as diarrhoea and skin diseases, because of unclean water, is rife in the community. The officials from the municipality highlighted the challenges of construction mafias, climate change, ageing and vandalism of infrastructure, and lack of skills as reasons that they cannot consistently provide clean and safe water. The chapter also looked at the various strategies that the government used to provide water during the COVID-19 pandemic, and some of the response strategies were the provision of water tanks and the establishment of boreholes. Most people in the community do not consider these strategies sustainable because of the problem of vandalism and lack of maintenance of borehole infrastructure. Besides the government's mandate to provide clean and safe water in the community, churches, NGOs, and the private sector have been helping to ensure that people have water, which is their human right according to the Constitution (RSA, 1996).

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CHAPTER FIVE: DISCUSSION, CONCLUSION AND POLICY IMPLICATIONS

5.1 INTRODUCTION

This chapter provides a detailed presentation of the summary of findings obtained following the methodology explained in Chapter 3, as well as a discussion, conclusions, and implications for government policymaking, as deduced from the empirical findings. This dissertation is written in response to COVID-19 and water delivery challenges in a rural community called Driekoppies in Mpumalanga province. In the context of water provision challenges in the Driekoppies community, and emphasising experiences and places (Chapters 2 and 3), the goal of the dissertation is to provide space for local voices on water provision challenges, which is mainly absent from the discourse of service provision, especially from rural areas. The goal was achieved by answering four research questions:

1. What were the challenges faced by the government in providing water to the rural society of Driekoppies before the COVID-19 pandemic?

2. What measures were adopted by the government to ensure water provision and access for the society of Driekoppies as a response to the COVID-19 outbreak?

3. How sustainable were the measures adopted by the government to ensure water access to Driekoppies? What does Driekoppies society view as a sustainable solution to their water problems?

4. Did non-state actors play any role in ensuring water access to Driekoppies in the context of challenges faced by the government?

To answer research questions one to four, I spent over a year in the field, from June 2022 to December 2023, in Driekoppies, Mpumalanga. To achieve this, empirical data collection for this study has been derived chiefly using non-participant observation and interviews as methods. When I entered the field, I started with the observation method, seeking to familiarise myself with the community and its surroundings. Some places

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that I visited were the community halls, Driekoppies stadium, and the schools. As I visited these places, I would also conduct interviews with relevant people (key informants), such as community leaders at the community hall and school teachers around the study area. Some insights emerged from using this research methodology, which is reflected in the subsequent research. Descriptive, explanatory, and exploratory work on complex issues such as climate change, pollution, and water contamination work best through interviews that enable respondents to show and tell. Using a qualitative methodology facilitated the understanding of new areas of study and encouraged discussions about sensitive issues like diseases and sickness caused by drinking unclean water. Answers that were unclear or poorly understood were addressed immediately. Data was analysed through thematic analysis, and a combination of non-participant observations and interviews has assisted in the triangulation of results, contributing to 1) obtaining reliable results and 2) the successful realisation of the entire dissertation project.

The findings underscore the urgent and ongoing water scarcity and quality issues that have plagued the Driekoppies community since 2005, a situation exacerbated by climate change and poor infrastructure. This has led to health risks, economic burdens, and unreliable municipal solutions. Residents, particularly women, must travel long distances in search of water, rely on irregular tanker deliveries, or purchase water at high costs, disproportionately affecting low-income households. The community's health and hygiene are compromised, especially at the local clinic, which also struggles with intermittent water supply, impacting patient care and sanitation. Despite municipal promises and temporary borehole installations, water shortages persist, intensifying community frustration and prompting government scrutiny and interventions.

The findings reveal that water shortages in Driekoppies are partly due to ‘construction mafias’, which are groups that disrupt water projects by demanding jobs or fees that delay progress and leave infrastructure incomplete. Additionally, water challenges in the community result from ageing water infrastructure. The area has outdated pipes (some dating back to the early 20th century) that are now leaking, which is a health hazard, as water becomes contaminated. Vandalism and illegal connections further strain the system, with informal settlements causing frequent pipe damage and illegal

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taps into the water supply. To address these challenges, the municipality is implementing funding models which include public-private partnerships and green bonds. In addition, the adoption of innovative technology for real-time monitoring and efficient repairs is used to address the challenges. Climate change worsens water scarcity, disrupting rainfall patterns and leading to droughts and inconsistent water supplies. Flooding contaminates water sources with waste, forcing periodic dam closures and leaving residents reliant on expensive water vendors. Nkomanzi Local Municipality needs help in attracting qualified professionals to work on infrastructure maintenance and project completion. Addressing these issues will require coordinated efforts across the government and private sectors to build skills, reduce corruption, and improve water planning and management.

The findings show that in response to the COVID-19 pandemic, the South African government allocated R20 billion to municipalities for emergency water provisions, including tanks and boreholes in Driekoppies. However, vandalism of these resources and logistical challenges hindered consistent access. This forced women to walk long distances or queue at remaining water points, increasing exposure to health risks and limiting physical distancing. Community members, particularly women, faced additional burdens, which included confrontations with police while trying to access water during lockdown. Despite advocacy efforts, water scarcity remains unresolved, leaving residents to rely on NGOs to press for solutions to secure fundamental rights.

It is clear that the current measures are not sufficient to address the root of the problem. The community believes that including informal settlements in water services and infrastructure and implementing rainwater harvesting are essential steps towards a more equitable and lasting solution to the water crisis in Driekoppies.

Government shortcomings in water provision in Driekoppies have necessitated the involvement of non-state actors, particularly the church, in addressing water scarcity. The church has become essential in providing borehole access to clean water, as community members struggle with inconsistent municipal supplies. It has also been instrumental in advocacy duties, obtaining a court order compelling the municipality to ensure safe drinking water, demonstrating its commitment to physical and spiritual community support. NGOs like Gift of the Givers have actively provided water tanks

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and sanitation resources, especially during the COVID-19 pandemic, and continue to foster public-private partnerships to improve water access. The private sector has collaborated with public entities to address water shortages in health facilities, designing innovations like foot-operated taps to promote hygiene, particularly during the pandemic. These efforts highlight the crucial role of non-state actors in communal water provision, fostering a sense of shared responsibility and the value of multi-stakeholder efforts to address public health and resource shortages. Overall, partnerships amongst churches, NGOs, and private sector entities support sustainable water access in Driekoppies.

5.2 DISCUSSION

This section discusses the findings from the previous chapter. It is segmented into four parts: an explanation of water problems, water provision during the COVID-19 pandemic, sustainability of water solutions provided by government and non-state actors, and the water problem.

5.2.1 Explanation of water problems

One of the explanations for water problems in Driekoppies, as revealed by the findings of this study, is the ageing and the vandalism of infrastructure. One of the reasons that have led to ageing infrastructure and failure to replace vandalised pipes is declining municipal finances. According to Ledger (2021), many municipalities' (Nkomanzi included) finance operating models are unsustainable and are a foundational reason for the current crisis-prone condition of municipalities. For example, at the beginning of the 2019/2020 financial year, 126 municipalities - more than half of the total - adopted unfunded budgets. This number was reduced to 66 following an intervention by the National Treasury, but it remains clear that municipal finances are unsustainable. There are growing levels of outstanding debt owed to municipalities (over R230 billion at the end of December 2020), with the majority (72%) owed by households. "The Auditor-General estimates that no more than 60 per cent of that debt can ever be recovered, given the assessed ability of households to pay" (Ledger, 2021:22).

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The reasons for household non-payment include an inability to pay in the context of unemployment and precarious employment. This structural challenge cannot be resolved through efforts towards 'responsible citizenship' with associated instruments of control. At the same time, municipalities themselves owe money to utilities like Eskom and Rand Water for 'bulk' purchases. According to Galvin (2021), "municipalities owed R7.3 billion to water boards at the end of 2017. The boards were in turn in debt to the Department of Water and Sanitation (DWS) for R11 billion". One consequence of these multiscale debt burdens is that municipalities intensify cost recovery practices to generate the revenue needed to pay creditors further up the chain.

A further consequence of declining municipal finances and debt burdens is that infrastructure is not extended, repaired, or maintained. This is reflected in the absence of bulk infrastructure (including extensions) by the DWS; it is also evident in the collapsing municipal infrastructure as municipalities neglect to perform repairs and maintenance, an activity that is meant to be funded out of service revenue. The knock-on effect of this infrastructural neglect is a decline in the quality of municipal services, as it reflects a spiral of low investment, low-cost recovery, and poor quality of service (Dugard, 2016; Pieterse, 2014). This decline is not uniform, with differences between water systems by geographical area and embedded in the legacy of apartheid geographies. Ultimately, the financial imperative - in the context of fiscal precarity - has trumped equity commitments in the provision of municipal services. Ironically, the municipal operating model deepens poverty and inequality (Ledger, 2021: 25).

The observed water problems in Driekoppies result from the climate change phenomenon. The situation in the study area is compounded by South Africa being a water-scarce country. The country's mean annual precipitation is 450 mm, well below the world average of 860 mm per year (Botai, Botai, de Wit, Ncongwane & Adeola, 2017). In terms of a commonly used definition, namely that of the average ‘total actual renewable water resources’ (TARWR) per person per year, South Africa is already ranked the 29th driest country out of 193 (Muller, Schreiner, Smith, van Koppen, Sally, Aliber, *et al.*, 2009). According to the Government Communication and Information System (GCIS) (2020), South Africa is the 30th driest country globally. To corroborate this submission, the South African Department of Environmental Affairs and Tourism

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(DEAT) identifies climate change as a significant environmental challenge facing the country's agriculture and water resources (Edokpayi, Makungo, Mathivha, Rivers, Volenzo & Odiyo, 2020). The adverse effects of climate change on freshwater resources in the country are mainly caused by rising temperature levels, evaporation, and fluctuating rainfall volumes and patterns (Honkonen, 2017).

The study found a lack of skills as one of the explanations for water challenges in the Driekoppies community. Munzhedzi and Phago (2020) indicate that many rural municipalities in provinces, including Limpopo, Mpumalanga, and the North West, are struggling to pass audits. Lack of crucial skills, such as accountants and internal auditors, is one of the reasons for the inability to conduct a clean audit. Many rural towns, such as Driekoppies, struggle to hire engineers, project managers, and experienced managers, in addition to a shortage of finance-related expertise. These abilities are required for South Africa's National Development Plan to be realised. The local sphere of government would be unable to fulfil its constitutional developmental duty without these skills and the capacity to provide essential municipal services. All municipalities within their authority must collaborate with local communities and other stakeholders to fulfil the development objective, which includes, in the current context, the management of the COVID-19 pandemic. Municipalities will likely fail in their development objective if they lack the expertise and competence to produce well-balanced budgets, internal auditors to advise on early deviations and internal accountability measures to combat corruption.

In some cases, the location of rural municipalities is a factor to consider. Rural municipalities struggle to attract and retain qualified applicants for essential posts because of a lack of capability in most rural municipalities. The skills and capacities of most municipalities in South Africa have also been a source of concern for the auditor general (Ngumbela, 2023).

5.2.2 Water provision during the Covid-19 pandemic

The study found that people who live in Driekoppies faced water challenges during the period of the COVID-19 pandemic. The main challenge identified was the cost of water

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and the limited supply to the community. Even though most households have their houses connected to the grid, they must buy water from other private sources because the tap water flow is inconsistent. The above result is consistent with the argument by Boakye-Ansah *et al.* (2019), who assert that equitable access to water is a long shot away in developing countries like South Africa because of the high level of ageing infrastructure and skills shortage in the water and sanitation sector.

The study also showed that some poor households who cannot afford to buy water from vendors mix the water sources. Some resort to rivers and other contaminated water sources. The United Nations Resolution 64/292 (UN, 2010) asserts that everyone is entitled to sufficient, safe, acceptable, physically accessible, and affordable water for domestic and personal use (Omarova, Tussupova, Hjorth, Kalishev & Dosmagambetova, 2019). However, in this study, the situation in the Driekoppies community is far from ideal. The population of the community and Nkomanzi Local Municipality is increasing; therefore, water demand is expected to increase in the future. Access to water is likely to worsen if deliberate efforts are not made to improve the current situation, and that clearly shows that the campaign to prevent the spread of COVID-19 through improved water access was most likely ineffective. COVID-19 protocols call for frequent handwashing with soap under running water.

The then UN Special Rapporteur on the Human Right to Safe Drinking Water and Sanitation, Catarina de Albuquerque has also noted that in emergencies, states are obligated to provide culturally appropriate services directly.' (UNHRC, 2014: para. 53). She also noted that violations of the water rights may result from a failure to act, to implement comprehensive plans and strategies that ensure the full realisation of the rights in the long term, to regulate non-state actors, and as an unintended consequence of policies, programmes, and other measures (Human Rights Watch, 2019).

5.2.3 Sustainability of water solutions provided by government

The study found that households in the study area consider rainwater harvesting a sustainable solution to their water challenges. The households looked at rainwater

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harvesting because apart from the natural water sources in the area and state-provided water infrastructure, they consider it a locally created means of preserving water for future use. However, even though households consider a sustainable solution to their water challenge, rainwater harvesting is no longer sustainable. It cannot be relied upon as a healthy and quality water source for people. This is so because of the decline in rainfall volumes as a result of climate change as well as the level of air pollution, which in turn affects the quality of water harvested (Apraku, Gyampohb, Mortonc, & Karikarid, 2023).

The view of rainwater harvesting by households as a solution to water challenges in Driekoppies is in contrast to a study by Owusu and Teye that was conducted in Old Fadama, Ghana in 2014. The households did not see rainwater as a sustainable solution to water challenges, but it can serve as a supplementary source (Owusu & Teye, 2014). Even though the study did not explore reasons for this low affinity towards rainwater, the high cost of the systems needed to harvest the rainwater, like roofs, gutters, and storage facilities, might be factors that dispel house owners from using the resource. The study further argued that the main reason is the poverty situation in the area. Even though most houses are roofed with iron roofing sheets, most dwellings are small and cannot gather enough rainfall to be stored and used.

5.2.4 Non-state actors and the water problem

The findings in Driekoppies show that non-state actors like churches, NGOs, and even the private sector, were active in providing water to households. Throughout South Africa, non-state actors are supplying basic services central to human survival. The actions of private entities have profound implications for the human right to water, making it necessary for these entities to comply with their constitutional obligations (SAHRC, 2022).

The South African Constitution is not directed solely to the public sphere but obliges horizontal application of its Bill of Rights to non-state actors (RSA, 1996). Section 8(2) of the Constitution provides that "[t]he Bill of Rights applies to all law, and binds the legislature, the executive, the judiciary and all organs of state [and] binds a natural or juristic person if, and to the extent that, it is applicable, taking into account the nature

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of the right and the nature of any duty imposed by the right." This provision, therefore, binds natural and juristic persons, including the private sphere. However, despite this Constitutional mandate, some commentators argue that the right to access sufficient water should not impose positive burdens on private agencies (SAHRC, 2022).

5.3 CONCLUSION

COVID-19 has created extraordinary situations that demand critical access to water (Smiley, Agbemor, Adams & Tutu, 2020). However, the rural nature of Driekoppies, the challenging geographic terrain, and the scattered nature of human settlements impact the Nkomanzi Local Municipality's ability to deliver water to the community. South Africa's history of apartheid geospatial planning has resulted in many rural areas not having access to essential water supply and sanitation services (Masindi & Duncker, 2016). Numerous programmes have been initiated to eradicate historical geospatial inequalities and socio-economic disparities since 1994. Despite these programmes, overt inequalities in water infrastructure delivery still exist between rural and urban areas. Rural provinces and small towns are predominantly characterised by relatively high-water infrastructure backlogs and low water service reliability.

The dissertation examined COVID-19 and water delivery challenges in the rural society of Driekoppies in Mpumalanga. The findings show that households in Driekoppies have inadequate water supply. The situation requires urgent attention, as this is far from ideal to curb the devastating impact of COVID-19. Most households have taps on their premises, but the water is hardly delivered to the taps. The government's intervention strategies, such as the installation of water tanks that are filled by water trucks and the drilling of boreholes, failed to solve water challenges in the area during the COVID-19 period. The study found that households use different strategies to manage water, including water storage in containers, buying water from vendors, and resorting to other water sources such as streams and ponds.

It is evident that the reactive approach taken by the government in response to the COVID-19 pandemic has not led to sustainable solutions for the water crisis in Driekoppies. This short-term focus has resulted in a failure to address the water

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problems both during the peak of the pandemic and in the long term. Urgent action is needed to develop and implement a permanent, sustainable solution to the water challenges in the study area.

5.4 KEY POLICY IMPLICATIONS AND PRESCRIPTIONS

The South African government is legally bound by Section 154(1) of the Constitution (RSA, 1996), which states that the national and provincial governments are required, through legislative and other measures, to support and strengthen municipalities' capacity to manage their own affairs. Should a municipality not fulfil its constitutional and legislative obligations, the national and provincial governments may intervene in that municipality to ensure the fulfilment of its obligations (RSA, 1996: Section 139). This study suggests policy ideas based on the findings to fulfil this mandate.

A key challenge in municipalities is the lack of financial resources. The study recommends that policymakers emphasise that municipalities form public-private partnership (PPP) arrangements, which will help to create synergy and share risks and rewards between the public and private sectors. This would require the municipality to test new ways of funding water and sanitation services, such as leasing models for large capital expenditure projects, PPP options, guarantees through blended finance models, ring-fenced financial management, and procurement mechanisms allowing public-private funding models.

The study recommends that the municipality must recruit capable and qualified personnel. The municipality must conduct workshops and training for newly recruited staff members so that they can perform better. The municipality must be transparent with its recruitment, shortlisting, and interview processes. Proper procedures must be followed, and political influence should not be allowed during these processes. Prospective job applicants should undergo rigorous checks and verifications so that the municipality can employ only qualified and appropriate personnel. A municipal administrator employed in the finance department should possess a financial qualification because a municipality requires a person with relevant experience and expertise to deal with fiscal matters. The municipality should refrain from employing

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people based on their political affiliations. In short, political interference should be disregarded at all costs during the municipality's recruitment drive. Performance agreement contracts should be designed and implemented.

The municipality must work closely with law enforcement agencies to report cases of vandalism, and the perpetrators of such vandalism must be prosecuted. Community members must take ownership of their community facilities and report any vandalism of public property. The Nkomazi Local Municipality, in collaboration with community members and other stakeholders, must develop awareness campaigns and educate community members about the dangers of excessive and illicit garbage dumping. The community must know that illicit dumping poses significant potential environmental hazards. Communities need to take care of their environment and keep it clean and safe at all times. One way of teaching is by the so-called ‘three Rs': reduce, reuse, and recycle, whereby people are taught that waste material can be recycled to maintain a sustainable environment. Community members must be taught that waste material can be reused and recycled into valuable items and that they can even open businesses and sell these. Plastic, glass, and cardboard boxes can reproduce items such as caps, rubber mats, drinking cups, and many other kitchen utensils.

5.5 AREAS FOR FUTURE RESEARCH

Further research that explores how vulnerable groups, particularly women, older people, and people with disabilities, are impacted by climate change and water service delivery challenges simultaneously, would be valuable. This is particularly valid as the impacts of climate change grow, and climate change risks widen gender-based disparities (Sorensen, Saunik, Sehgal, Tewary, Govindan, Lemery & Balbus, 2018). Further research could increase the understanding of the barriers for vulnerable groups and enhance the understanding of additional causality and interdependencies between variables.

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Annexure A: Information Sheet and Consent Form – Key Informants

Faculty of Humanities
Fakulteit Geesteswetenskappe
Lefapha la Bomotho

Humanities 100 Since 1919

Department of Anthropology, Archaeology & Development Studies

Department of Anthropology and Archaeology

ANNEXTURE A

INFORMATION SHEET AND CONSENT FORM FOR KEY INFORMANTS

TITLE OF STUDY: OLD PROBLEMS, NEW CRISIS AND SUDDEN SOLUTIONS: COVID-19 AND WATER DELIVERY CHALLENGES IN THE RURAL SOCIETY OF DRIEKOPPIES IN MPUMALANGA.

INVITATION

You are invited to participate in my research study. Before you decide, it is important that you understand why the research is being done and what it involves, as well as what is required of you. The study will be conducted by me as the principal researcher. Please take time to read the information below, and discuss it with me if you wish. If there is anything that is not clear, or if you would like more information, please see my details below and ask me.

PRINCIPAL INVESTIGATOR

Name:	**Caroline Seitshiro**
Student number:	**20761610**
Name of Institution:	**University of Pretoria**
Address:	**Lynwood Road, Hatfield, Pretoria, 0002.**
Phone:	**071 165 8591**
Email:	**u20761610@tuks.co.za**

PURPOSE OF THE STUDY

You are being asked to take part in a research study. Before you decide to participate in this study, it is important that you understand why the research is being done and

Room 8.14, Humanities Building
University of Pretoria, Private Bag X20
Hatfield 0028, South Africa
Tel +27 (0)12 420 3526 |
Email vusi.thebe@up.ac.za | www.up.ac.za

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what it will involve. Please read the following information carefully. Please ask if there is anything that is not clear or if you need more information. The purpose of this study is to help explain the context of rural communities' water provision challenges in post-apartheid South Africa, and to improve our understanding of state failure to provide basic services in rural societies. The study will also highlight the inequality in access to services in South African society and the vulnerability of certain sectors to COVID 19.

WHAT WILL HAPPEN IN THE STUDY?

The study will involve interviews with you on the information and views on aspects that the study seeks to understand. The interviews will be conducted with you in person at a venue convenient to you. COVID-19 protocols such as wearing a mask, sanitizing and social distancing will be observed. The interviews will be conducted in a language that is convenient to you, and will take about 45 minutes or an hour at most.

RISKS AND DISCOMFORTS

- There will be no danger or harm to you or your organisation for participating.
- Your will be participation in this study in your own personal capacity and not as a representative of any institution.
- The views expressed in the interviews will be your personal views based on your expertise, understanding and role in the subject.
- Please also note that your participation is voluntary. It is up to you to decide whether to take part in this study.
- If you decide to take part in this study, you will be asked to sign a consent form.
- After you sign the consent form, you are still free to withdraw at any time and without giving a reason (Withdrawal from this study will not affect the relationship you have, if any, with me as the researcher).
- If you withdraw from the study before data collection is completed, the data obtained will be returned to you or destroyed.

Room 8.14, Humanities Building
University of Pretoria, Private Bag X20
Hatfield 0028, South Africa
Tel +27 (0)12 420 3526 |
Email vusi.thebe@up.ac.za | www.up.ac.za

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- Every effort will be made to adhere to COVID-19 protocols.

BENEFITS

No benefits in the form of payment will accrue to you for participating in the study. Your participation will assist me to produce an academic dissertation for my qualification.

CONFIDENTIALITY

Your responses to this interview will be anonymous. Apart from me as the researcher, the data will be shared with my supervisor, Prof. Vusi Thebe of the University of Pretoria. Please do not write any identifying information on your sheet. I will make an effort to preserve your confidentiality including the following:

- I will be using a pseudonym to keep your identity confidential, and I will make every effort to ensure that the information you share is not linked to you, although in some instances it may be difficult because of the position you hold in the community.
- I will keep notes, interview transcriptions, and any other identifying participant information in a password-protected computer and/or locked file cabinet in my possession during fieldwork and archive for 15 years in line with the University of Pretoria's archiving regulations. The data will only be used for research purposes.
- Participant data will be kept confidential except in cases where I am legally obligated to report specific incidents. These incidents include, but may not be limited to, incidents of abuse and suicide risk.
- The results will be produced in a form of a dissertation and scientific paper or may be presented at both local and international forums like workshops and conferences.

CONTACT INFORMATION

Room 8-14, Humanities Building
University of Pretoria, Private Bag X20
Hatfield 0028, South Africa
Tel +27 (0)12 420 3526 |
Email vusi.thebe@up.ac.za | www.up.ac.za

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If you have questions at any time about this study, or you experience adverse effects as the result of participating in this study, you may contact the researcher whose contact information is provided on the first page. If you have questions regarding your rights as a research participant, or if problems arise which you do not feel you can discuss with me as the Primary Investigator, please contact my supervisor.

Supervisor: Prof. Vusi Thebe

Phone: 012 420 3526

Email: vusi.thebe@up.ac.za

CONSENT FORM

TITLE OF STUDY: OLD PROBLEMS, NEW CRISIS AND SUDDEN SOLUTIONS: COVID-19 AND WATER DELIVERY CHALLENGES IN THE RURAL SOCIETY OF DRIEKOPPIES IN MPUMALANGA.

[Please tick and sign]

• I have read and I understand the provided information and have had the opportunity to ask questions.	
• I understand that my participation is voluntary and that I am free to withdraw at any time, without giving a reason and without cost.	

Room 8.14, Humanities Building
University of Pretoria, Private Bag X20
Hatfield 0028, South Africa
Tel +27 (0)12 420 3526 |
Email vusi.thebe@up.ac.za | www.up.ac.za

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• I agree to provide information as part of my involvement in this study and I understand I will not gain any direct personal or financial benefit from the researcher.	
• I understand that I will be given a copy of this consent form.	
• I agree to audio/video recording and the use of anonymised quotes in research reports and publications.	
• I voluntarily agree to take part in this study.	

Participant's signature _____ Date _____

Investigator's signature _____ Date 8 September 2022

Room 8.14, Humanities Building
University of Pretoria, Private Bag X20
Hatfield 0028, South Africa
Tel +27 (0)12 420 3526 |
Email vuid.thebe@up.ac.za | www.up.ac.za

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Annexure B: Information Sheet and Consent Form – Key Informants

Faculty of Humanities
Fakulteit Geesteswetenskappe
Lefapha la Bomotho

Humanities 100
Since 1919

Department of Anthropology, Archaeology & Development Studies

Department of Anthropology and Archaeology

ANNEXTURE B

INFORMATION SHEET AND CONSENT FORM FOR COMMUNITY MEMBERS

TITLE OF STUDY: OLD PROBLEMS, NEW CRISIS AND SUDDEN SOLUTIONS: COVID-19 AND WATER DELIVERY CHALLENGES IN THE RURAL SOCIETY OF DRIEKOPPIES IN MPUMALANGA.

INVITATION

You are invited to participate in my research study. Before you decide, it is important that you understand why the research is being done and what it involves, as well as what is required of you. The study will be conducted by me as the principal researcher. Please take time to read the information below, and discuss it with me if you wish. If there is anything that is not clear, or if you would like more information, please see my details below and ask me.

PRINCIPAL INVESTIGATOR

Name:	**Caroline Seitshiro**
Student number:	**20761610**
Name of institution:	**University of Pretoria**
Address:	**Lynwood Road, Hatfield, Pretoria, 0002.**
Phone:	**071 165 8591**
Email:	**u20761610@tuks.co.za**

PURPOSE OF THE STUDY

You are being asked to take part in a research study. Before you decide to participate in this study, it is important that you understand why the research is being done and

Room 8.14, Humanities Building
University of Pretoria, Private Bag X20
Hatfield 0028, South Africa
Tel +27 (0)12 420 3526 |
Email vusi.thebe@up.ac.za | www.up.ac.za

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what it will involve. Please read the following information carefully. Please ask if there is anything that is not clear or if you need more information. The purpose of this study is to help explain the context of rural communities' water provision challenges in post-apartheid South Africa, and to improve our understanding of state failure to provide basic services in rural societies. The study will also highlight the inequality in access to services in South African society and the vulnerability of certain sectors to COVID 19.

WHAT WILL HAPPEN IN THE STUDY?

The study will involve interviews with you on the information and views on aspects that the study seeks to understand. The interviews will be conducted with you in person at a venue convenient to you. COVID-19 protocols such as wearing a mask, sanitizing and social distancing will be observed. The interviews will be conducted in a language that is convenient to you, and will take about 45 minutes or an hour at most. Your interview answers will be written down and recorded for reference.

RISKS AND DISCOMFORTS

- There will be no danger or harm to you for participating.
- Your participation in this study is voluntary.
- If you decide to take part in this study, you will be asked to sign a consent form.
- After you sign the consent form, you are still free to withdraw at any time and without giving a reason (Withdrawal from this study will not affect the relationship you have, if any, with me as the researcher).
- If you withdraw from the study before data collection is completed, the data obtained will be returned to you or destroyed.
- Every effort will be made to adhere to COVID-19 protocols.

BENEFITS

Room 8.14, Humanities Building
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Hatfield 0028, South Africa
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Email vusi.thebe@up.ac.za | www.up.ac.za

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No benefits in the form of payment will accrue to you for participating in the study. Your participation will assist me to produce an academic dissertation for my qualification, although indirect benefits may be realised in terms of improvement in water provision situation, if the local government acts on your concerns.

CONFIDENTIALITY

Apart from me as the researcher, the data will be shared with my supervisor, Prof. Vusi Thebe of the University of Pretoria. Please do not write any identifying information on your sheet. I will make an effort to preserve your confidentiality including the following:

- I will be assigning you a pseudonym, and I will make every effort to ensure that the information you share is not linked to you.
- I will keep notes, interview transcriptions, recordings, and any other identifying participant information in a password protected computer and/or locked file cabinet in my personal possession during field work. The data will be deposited in a university depository after the study, and may be used for further studies.
- The results will be produced in a form of dissertation and scientific paper, or may be presented at both local and international forums like workshops and conferences.

CONTACT INFORMATION

If you have questions at any time about this study, or you experience adverse effects as the result of participating in this study, you may contact the researcher whose contact information is provided on the first page. If you have questions regarding your rights as a research participant, or if problems arise which you do not feel you can discuss with me as the Primary Investigator, please contact my supervisor.

Supervisor: Prof. Vusi Thebe

Room 8.14, Humanities Building
University of Pretoria, Private Bag X20
Hatfield 0028, South Africa
Tel +27 (0)12 420 3526 |
Email vusi.thebe@up.ac.za | www.up.ac.za

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Phone: 012 420 3526

Email: vusi.thebe@up.ac.za

CONSENT FORM

TITLE OF STUDY: OLD PROBLEMS, NEW CRISIS AND SUDDEN SOLUTIONS: COVID-19 AND WATER DELIVERY CHALLENGES IN THE RURAL SOCIETY OF DRIEKOPPIES IN MPUMALANGA.

[Please tick and sign]

• I have read and I understand the provided information and have had the opportunity to ask questions.	
• I understand that my participation is voluntary and that I am free to withdraw at any time, without giving a reason and without cost.	
• I agree to provide information as part of my involvement in this study and I understand I will not gain any direct personal or financial benefit from the researcher.	
• I understand that I will be given a copy of this consent form.	
• I agree to audio/video recording and the use of anonymised quotes in research reports and publications.	

Room 6.14, Humanities Building
University of Pretoria, Private Bag X20
Hatfield 0028, South Africa
Tel +27 (0)12 420 3526 |
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• I voluntarily agree to take part in this study.	

Participant's signature _____ Date _____

Investigator's signature  Date 8 September 2022

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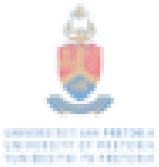
Annexure C: Interview Guide for Key Informants



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Department of Anthropology and Archaeology

INTERVIEW GUIDE FOR KEY INFORMANT 8

Pre COVID-19 experiences

Information collected from the following questions will consist of the kinds of concerns and challenges key informants dealt with regarding water access before the COVID-19 pandemic that led to have a national lockdown. Example question below:

1. What were the challenges faced by the government in providing water to the rural society of Driekoppies before COVID-19?

Sub-questions

- Did the community have access to water before COVID-19?
- Was the government facing any challenges in providing the community of Driekoppies with water?
- What were those challenges?
- Did the find solutions for those challenges?

During COVID-19 experiences

Information collected from the following questions will consist of the kinds of concerns and challenges key informants dealt with regarding water access during the COVID-19 lockdown regarding water provision to the community. This will create a timeline for comparison with the pre Covid-19 experience. Example question below:

1. Was the government able to provide the community of Driekoppies with more water during COVID-19?
2. What measures were adopted by the government to ensure water provision and access for the society of Driekoppies as a response to COVID-19?

Sub-questions

- Did the community have access to water during COVID-19?

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- Was the government facing any challenges in providing the community of Driekoppies with water during COVID-19?
- What measures did the government adopt to ensure water provision and access for the society of Driekoppies as a response to COVID-19?
- Were the measures taken by the government for water provision and access sustainable?

Government based questions

Information gathered from this section include the actions that were taking in consideration by the government for the community, along with what feasible action could have and still can be taken by the university for the betterment of water access to the community for the duration of Covid 19 and for future crises. Example questions include:

1. How sustainable were the measures adopted by the government to ensure water access to Driekoppies?
2. Did non-state actors play any role in ensuring water access to Driekoppies, in the context of challenges faced by the government?

Sub-questions

- How sustainable were the measures adopted by the government to ensure water access to Driekoppies?
- What role did the non-state actors play in ensuring water access to Driekoppies?
- Was the role played by non-state actors sustainable in ensuring water access to Driekoppies?

Question and Answer session

At the end of the interview, participants will be given a chance to ask me questions that they might have regarding the study. Once completed, participants will be thanked for their time and participation and for sharing their experiences.

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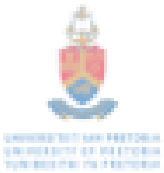
Appendix D: Interview Guide for Community Member



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INTERVIEW GUIDE FOR COMMUNITY MEMBERS

Pre COVID-19 experiences

Information collected from the following questions will consist of the kinds of concerns and challenges community members had regarding water access before the COVID-19 pandemic, which led to have a national lockdown. Example question below:

1. What were the challenges faced by the government in providing water to the rural society of Driekoppies before COVID 19?

Sub-questions

- Before COVID-19, did the community have access to water?
- Was the water clean or not clean?
- Was the water easily accessible for everyone or did the community face challenges to get water access?
- If the community faced challenges, what were those challenges?
- Were there solutions for those challenges, and was the solution sustainable?

During COVID-19 experiences

Information collected from the following questions will consist of the kinds of concerns and challenges had regarding water access during the COVID-19 lockdown. This will create a timeline for comparison with the pre Covid-19 experience. Example question below:

1. What measures were adopted by the government to ensure water provision and access for the society of Driekoppies as a response to COVID 19?

Sub-questions

- What problems and difficulties did the community face regarding water access during the lockdown?

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- What are some of the concerns the community faces today more than a year later?

Community based questions

Community member's opinions with regards to what they think or feel about the challenges and experiences they faced regarding water access will be gained in this section.

1. How sustainable were the measures adopted by the government to ensure water access to Driekoppies? What does Driekoppies society view as a sustainable solution to their water problems?

Sub-questions

- What does Driekoppies society view as a sustainable solution to their water problems?
- Does the community think that the actions that were taken by the government were satisfactory for them?
- What do you think could have been done more to provide the community with water?

Question and Answer session

At the end of the interview, participants will be given a chance to ask me questions that they might have regarding the study. Once completed, participants will be thanked for their time and participation and for sharing their experiences.

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University of Pretoria, Private Bag X20
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