

**SPATIAL PLANNING STRATEGIES FOR IMPROVING HOUSEHOLD WATER
SERVICE DELIVERY IN SCHULZENDAL VILLAGE OF NKOMAZI LOCAL
MUNICIPALITY, SOUTH AFRICA.**

BY

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UNIVERSITY OF VENDA

2025

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**THIS DISSERTATION IS SUBMITTED IN PARTIAL FULFILMENT OF THE
REQUIREMENTS FOR THE AWARD OF THE MASTERS IN URBAN AND
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AGRICULTURE, UNIVERSITY OF VENDA, SOUTH AFRICA**

MAY 2025

DECLARATION

I, Ingiphile Gift Shakoane, Student No: 16003476, hereby declare that the work presented in this dissertation, *Spatial Planning Strategies for Improving Water Service Delivery in Schulzendal Village of Nkomazi Local Municipality, South Africa*, is my own original research and has not been submitted previously for any degree or qualification at the University of Venda or any other institution of higher learning. To the best of my knowledge and belief, all sources used have been appropriately acknowledged, and the content reflects my effort in both design and execution.



28 April 2025

Signature

Date

DEDICATION

This dissertation is dedicated to my unborn son and my daughter, Isenathi, for giving me the strength to complete this study. Every day, when I look at you, you inspire me to be better and do better. May you grow up knowing that you can achieve anything you set your mind to. I pray that God blesses you and guides you as you grow and pursue your dreams.

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ABSTRACT

Household water provision is a local government mandate worldwide. Water service provision is mostly linked to the health of communities. However, in most developing nations, water service delivery is hindered by organisation, governance, financial constraints, and capacity challenges, which are worsened by urbanisation. These are particularly pronounced in rural areas like Schulzendal Village of Nkomazi Local Municipality, South Africa, where household water service delivery remains a persistent problem. The study aim was to investigate spatial planning strategies for improving household water service delivery in Schulzendal Village of Nkomazi Local Municipality. The objectives of the study were to ascertain the condition of household water service delivery in Schulzendal Village of Nkomazi Local Municipality; to determine the challenges faced by Nkomazi Local Municipality in the delivery of household water services to Schulzendal Village and to propose spatial planning strategies for improving household water service delivery. The study was also informed by the Public Goods theory, Central Place Theory and the Principal Agent Theory. Both qualitative and quantitative approaches were employed in this study. Purposive sampling was used to select key informants, including 2 traditional leaders and 5 municipal officials. A convenience sampling method was applied to distribute 253 household questionnaires. Additionally, snowball sampling helped identify respondents that were hard to reach, while participatory observation was conducted to complement the data and gain insights into the community's household water access experiences. The study revealed that residents of Schulzendal Village are highly unhappy with the condition of water service delivery. Most of the respondents complained of poor infrastructure, poor quality of water and even water supply chain which has a drastic impact on their lives. Challenges of land tenure issues, dilapidated infrastructure, limited municipal funding, corruption, political interference among others were identified as the key challenges faced by Nkomazi Local municipality in the delivery of household water to Schulzendal Village. The study proposed active community engagement in planning and decision-making processes, the development of strategic infrastructure, and the integration of water management priorities into urban planning frameworks among other key approaches as spatial planning strategies for improving water service delivery to Schulzendal village.

Keywords: *Spatial Planning strategies, Rural areas, Strategies, Household water, Water provision & Service delivery.*

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LIST OF ACRONYMS

COGTA	: Department of Cooperative Governance and Traditional Affairs
DWA	: Department of Water Affairs
IDP	: Integrated Development Plan
LG	: Local Government
NKLM	: Nkomazi Local Municipality
SDBIP	: Service Delivery and Budget Implementation Plan
SDF	: Spatial Development Framework
SDG	: Sustainable Development Goal
MDG	: Millennium Development Goals
WSA	: Water Service Authorities
WSDP	: Water Services Development Plan
WSP	: Water Service Providers
PAT	: Principal Agent Theory

CHAPTER 1: BACKGROUND OF THE STUDY

1.1 Introduction

Globally, the provision of adequate, affordable, and high-quality household water services is regarded as a core function of municipal governments. Water service provision is mostly linked to the well-being of communities. However, in most developing countries, water service delivery is hindered by organisation, governance, financial constraints, and capacity challenges, which are worsened by urbanisation (Avis, 2016). All spheres of government contribute to household water service delivery, including working with other parties and institutions. National spheres of governments establish the water service policy framework and then delegate authority to local governments to carry it out. Even if service delivery is outsourced to the private sector or non-governmental organizations, the primary responsibility for providing basic services including household water usually rests with the city or municipal government. Globally, having sustainable household water implies providing everyone on earth with affordable access to at least 20 to 50 litres of water a day for survival (Aqua Tech, 2019). This follows the United Nations General Assembly's recognition of “the right to safe and clean drinking water and sanitation as a human right that is essential for the full enjoyment of life and all human rights”.

Household water service delivery is a function of local government in South Africa as obligated by the Local Government Municipal Systems Act 32 (2000) and the White Paper on Local Government (1998). Furthermore, the Constitution of the Republic of South Africa Act 108 of 1996 mandates local governments in the form of municipalities to “ensure the provision of services to communities in a sustainable manner”. This includes the provision and delivery of household water to all areas within the country whether rural or urban. Section 27(1)(b) of the Constitution states that “Everyone has the right to have access to sufficient food and water.” Section 27(1)(b) and section 27(2) entails that “the state must take reasonable legislative and other measures, within its available resources, to achieve the progressive realisation of each of these rights”. Water access is not only a fundamental right in its own, but also plays a vital role in supporting public health, ensuring food security, and fostering economic progress

Service delivery is the “distribution of basic services such as safe water supply, electricity, health services, roads, street lighting, traffic controls, refuse collection, sewage disposal and maintenance, as well as municipal parks and recreation” (Development Bank of Southern

Africa, 2022). The significance of service delivery falls on local governments as they are responsible for maintaining and promoting healthy living conditions as well as improving the quality of life for communities within their area of jurisdiction. According to Aqua Tech (2019), water service delivery means the provision of sufficient water to meet multiple needs, from agricultural needs to municipal and industrial needs. Moreover, providing water services involves ensuring a reliable supply even in the face of climate-related challenges like droughts, reduced rainfall, or excessive precipitation and flooding. It also involves managing the economic aspects of balancing water supply with demand, while striving for maximum efficiency in the delivery system. (Aqua Tech, 2019).

In South Africa, the facilitation and extension of water services is undertaken by various actors, but the main actor is the Department of Water Affairs (DWA) as an overall policy designer and regulator, as well as local government institution in the form of local and district municipalities as Water Service Providers (WSPs) or Water Service Authorities (WSAs; Nkuna & Ngorima, 2011). According to the DWA (2013), local municipalities as WSAs have the responsibility to provide the first 6,000 litres of water per household per month free of charge. This approach aims to guarantee that individuals, especially the rural poor who may lack the means to pay, can still access a minimum standard of water services necessary to meet essential daily needs. The government provides financing tools such as the Municipal Infrastructure Grant (MIG) and the Municipal Water Infrastructure Grant (MWIG) to enable the planning and implementation of water projects to ensure supply to areas acknowledged as not receiving the minimum water supply service.

The Municipal Systems Act 32 (2000) obligates municipalities to formulate an Integrated Development Plan (IDP), which serves as a comprehensive planning method that engages both the municipality and its residents in identifying optimal strategies for sustainable development. Section 153 of the Constitution of the Republic of South Africa (1996) states that “A municipality must organize and manage its administration, budgeting, and planning processes to give priority to the community's basic needs and to promote the community's social and economic development,”. The IDP guides and informs the municipal budget to ensure the delivery sustainable basic services including water to areas within their jurisdiction. The provision of clean drinking water to communities whether urban or rural is a high priority by the Constitution of the Republic of South Africa.

Despite all the government's efforts and initiatives, most South African rural areas remain challenged of unsustainable water service provision. Large numbers of people still do not have access to water services. In rural areas where water is available, the quality of drinking water is normally poor and cannot be labelled as "safe drinking water" (Department of Science and Innovation). This observation is partly validated service delivery protests over the past years.

Nkomazi Local Municipality is a municipality falling under Ehlanzeni District in the Mpumalanga Province. In terms of water services, the municipality is an authorised Water Service Authority. Moreover, in terms of settlement patterns the municipality is serving the predominantly rural communities, only about 7.3% consists of the urban settlements and 89.8% are rural villages (Nkomazi Local Municipality IDP, 2018-2022). The municipality has 33 wards as per the Municipal Demarcation Board. Moreover, there are 8 Tribal Authorities and approximately 50 villages including Schulzental village (Nkomazi Local Municipality IDP, 2018-2022). Essential services such as water, electricity, sanitation, waste management, and social facilities have been recognized by rural communities as vital for fulfilling their fundamental needs. However, constrained financial resources and rapid population growth within the Municipality have steered a rise in service delivery backlogs (Nkomazi Local Municipality IDP, 2018-2022). Therefore, this research will suggest spatial planning strategies for improving household water service delivery in Schulzental Village of Nkomazi Local Municipality.

1.2 Rationale

Globally, ensuring access to clean water and proper sanitation is crucial for advancing both public health and overall development (World Health Organization, 2022). However, according to the initial data released for the Sustainable Development Goals (SDGs), in 2015, approximately 844 million individuals lacked access to water, and around 2.1 billion were without safe drinking water—most of whom resided in rural communities. In addition, poor sanitation and polluted water sources are linked to the daily deaths of roughly 1,600 children from related illnesses (World Vision, 2014).

In South Africa, since the dawn of democracy, the government has struggled to address service delivery matters. However, backlogs in service delivery are not unique to South Africa, it is a problem that many developing countries face (Nyamukachi, 2004). Providing water services for all citizens remains a challenge to the South African government, particularly local

government, as it is responsible for providing household water services to all areas within its jurisdiction as obligated by the White Paper on Local Government (1998) and the Local Government Municipal Systems Act 32 (2000). Despite the implementation of various measures, research indicates that many rural communities in South Africa lack adequate access to water, often relying on unsafe and unprotected sources to meet their daily needs. According to Berkowitz (2009), this issue is particularly prevalent in smaller municipalities that serve rural populations, whereas it is largely absent in larger municipalities and metropolitan regions."

Available literature on water service delivery has not focused on "spatial planning strategies for improving household water service delivery in rural areas" as existing literature focuses mostly on urban areas and does not incorporate spatial planning strategies (Berkowitz, Dugard, Smith, & Tissington, 2009). For example, a study conducted by the Institute for Housing and Urban Development Studies (1999) focused on Sustainable Urban Water Management Strategies. Another study by Cross and Morel focused on Pro-poor Strategies for Urban Water Supply and Sanitation Services Delivery in Africa (2005). Meanwhile, Makhari (2015) focused on the assessment of water service delivery in the municipalities of City of Tshwane, City of Cape Town, and Ethekwini. Sausi (2011) studied ways towards water service delivery in OR Tambo and Amathole District municipalities. A few of the studies that touched on the rural areas water service delivery comprehensively focused on the broader aspect of service delivery with no specific focus as evidenced by Mishra (2022) who studied ways of collaborating with social entrepreneurs for public service delivery in rural areas. Therefore, it is important for this study to be carried out as literature on spatial planning strategies for improving household water service delivery in rural areas of developing nations is scarce. Also, there is no prior study on the spatial planning strategies for improving household water service delivery conducted in rural areas of Nkomazi Local Municipality, this will be the first of its kind.

This study is also motivated by the need to improve household water service delivery in Schulzental Village of Nkomazi Local Municipality. The researcher stays in the village and has seen the dynamics will regard to household water provision. Residents are in a dreadful need of household water services, and it is of utmost importance to ensure that the problem of household water service delivery is addressed as a matter of urgency, given that service delivery is a constitutional mandate and access to water is a human right and therefore, this

study will propose spatial planning strategies for improving household water service delivery in Schulzendal Village of Nkomazi Local Municipality.

1.3 Statement of the problem

The condition of household water service delivery in rural areas of Nkomazi Local Municipality, reflects persisting high number of households without access to sustainable water service delivery, given that out of 103 963 households, only about 53778 households have access to a water pipe inside the yard (Nkomazi IDP, 2018-2022 & (Community Survey: Statistics South Africa, 2016)). Schulzendal is a village located in Nkomazi Local municipality. Furthermore, the municipality recorded the second worst Blue Drop status in Mpumalanga province (Nkomazi Local Municipality IDP, 2018-2022). The existing situation calls for attention to enhance the local municipality to fulfil its mandatory duty as a Water Service Provision Authority.

1.4 Aim of the study

The aim of the study is to investigate spatial planning strategies for improving household water service delivery in Schulzendal Village of Nkomazi Local Municipality.

1.5 Objectives of the study

The study seeks to achieve the following objectives:

1. To ascertain the condition of household water service delivery in Schulzendal Village of Nkomazi Local Municipality.
2. To determine the challenges faced by Nkomazi Local Municipality in the delivery of household water services to Schulzendal Village.
3. To propose spatial planning strategies for improving household water service delivery in Schulzendal Village of Nkomazi Local Municipality.

1.6 Research questions

This section presents the following research questions and sub-problem questions:

Table 1.1: Research Questions

Source: Author (2023)

Research questions	Sub-problem questions
1. What is the condition of household water service delivery in Schulzental Village of Nkomazi Local Municipality?	❖ Where does the community of Schulzental Village get water from? ❖ How often does the Village get water? ❖ Is household water service delivery in Schulzental Village adequate?
2. What are the challenges faced by Nkomazi Local Municipality in the delivery of household water services to Schulzental Village?	❖ Is Schulzental Village involved in household water service delivery decision making processes? ❖ How does Nkomazi Local Municipality distribute household water to Schulzental Village? ❖ How has the Nkomazi Local Municipality household water service delivery been performing? ❖ Does Nkomazi Local Municipality have enough resources for household water provision? ❖ What relationship exists between the Nkomazi Local Municipality and authorities of Schulzental Village in relation to household water provision? ❖ Does Nkomazi Local Municipality have enough budget to improve household water service delivery in Schulzental Village?
3. What spatial planning strategies can be proposed for improving household water service delivery in Schulzental Village of Nkomazi Local Municipality?	❖ Are there alternative natural water sources that Schulzental Village can use? ❖ Does Nkomazi Local Municipality have plans and projects for improving household water service delivery in Schulzental Village? ❖ How can Nkomazi Local Municipality involve private companies and stakeholders in household water provision to Schulzental Village?

Source: (Author 2024)

1.7 Significance of the study

The research is significant to the following:

1.7.1 Local government

As the designated Water Services Authority, Nkomazi Local Municipality is required to comply with the applicable provisions outlined in the Water Services Act (Act 108 of 1997) and the Municipal Systems Act (Act 32 of 2000). Section 11 of the Water Services Act states that “Every water services authority has a duty to all consumers or potential consumers in its area of jurisdiction to progressively ensure efficient, affordable, economical and sustainable access to water services.” Therefore, this research is significant, given that it will propose strategies that can be implemented by the Municipality in order to carry out its constitutional mandate of providing sustainable services as well as its responsibility as a Water Service Provider to provide water services in rural areas within its jurisdiction.

1.7.2 Academia

This study seeks to contribute to the pool of knowledge of household water service delivery in rural areas. Studies have been conducted regarding water service delivery in rural areas as well as service delivery in general, however, there is no known study conducted on the spatial planning strategies for improving household water service delivery in Schulzental Village of Nkomazi Local Municipality. Therefore, this research could serve as a reference for an individual who would like to conduct a study in relation water service delivery in rural areas.

1.7.3 Community

Rural residents of NKLM especially residents from Schulzental Village are in a dreadful need of household water services and it is of utmost importance to ensure that the problem of household water service delivery is addressed as a matter of urgency, given that service delivery is a constitutional mandate and access to water is a human right. Therefore, this research is significant because it seeks to serve as an advocate for rural residents of NKLM and rural residents globally. The study findings and the strategies proposed are expected to change the lives of those living in rural communities without access to household water, given that the findings will serve as a reference for policy makers and local authorities for them to carry out

their constitutional mandate so that people can realise their constitutional rights and also enjoy the benefits of a democratic local government.

1.7.4 Policy makers

The findings of this research and the strategies proposed could assist policymakers to make strategic decisions grounded on challenges confronted by municipalities in household water delivery to rural areas. The strategies that the research will propose might also be applied to address similar problems experienced in other rural areas in relation to household water service delivery.

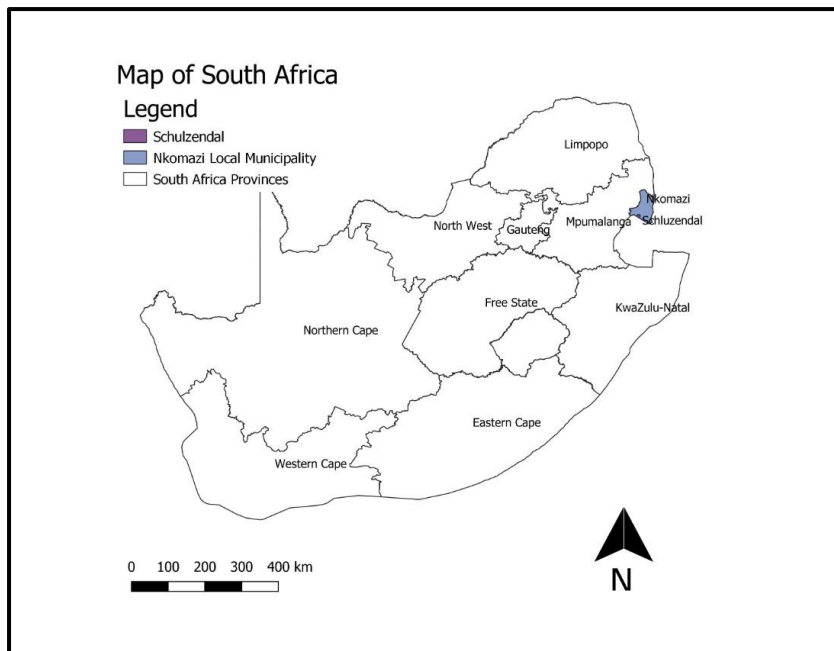
1.8 Scope of the study

This scope of the study covers the following:

1.8.1 Spatial scope

The study will be conducted in Nkomazi Local Municipality. The municipality is predominantly rural, hence why the researcher will focus only on a rural area called Schulzendal Village where there are household water service delivery issues.

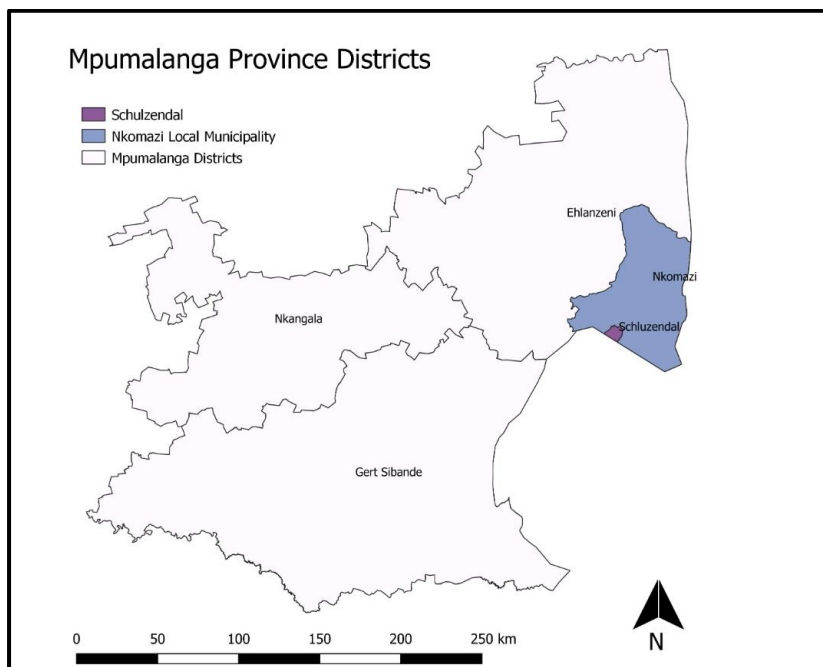
According to the Constitution of South Africa (Act 108 of 1996), the country is divided into nine (9) provinces, each governed by its own legislature, a premier, and a council of provincial executive members. Mpumalanga is one of the nine South African provinces.



Map 1.1: Map of South Africa

Source: Author (2022)

Mpumalanga Province comprises three districts which are Nkangala district, Gert-Sibande district as well as Ehlanzeni district as highlighted in Map 1.3 below.

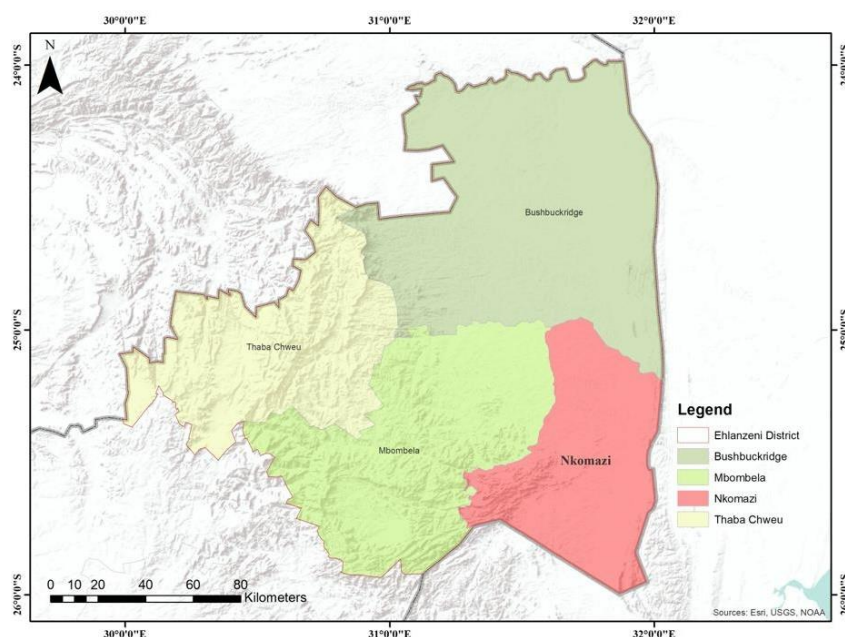


Map 1.2. Mpumalanga province map showing its 3 district municipalities

Source: Author (2022)

Each district consists of different municipalities and Ehlanzeni district consists of four municipalities. Nkomazi is one of the four municipalities of Ehlanzeni district. Furthermore, there are now four types of municipalities across the whole country including rural areas and tribal areas. Under the South African Constitution (Act 108 of 1996), municipalities are classified into four categories: metropolitan municipalities (Category A), local municipalities (Category B), district municipalities (Category C), and district management areas (DMAs). Category A municipalities function independently, while Category C municipalities are split into Category B local authorities (municipalities) and DMAs. Nkomazi Local Municipality falls under the Category B classification.

The municipality is situated in the eastern region of Ehlanzeni District within Mpumalanga Province, positioned strategically between Swaziland to the north and Mozambique to the east, as shown in Figure 1.4 below. It is also bounded by Kruger National Park to the north and City of Mbombela Local Municipality to the west. The municipality has a population size of about 549 574 people. It takes up 22% of the district's population with the number of households estimated at 94 942 and an average household size of about 6.32 people.

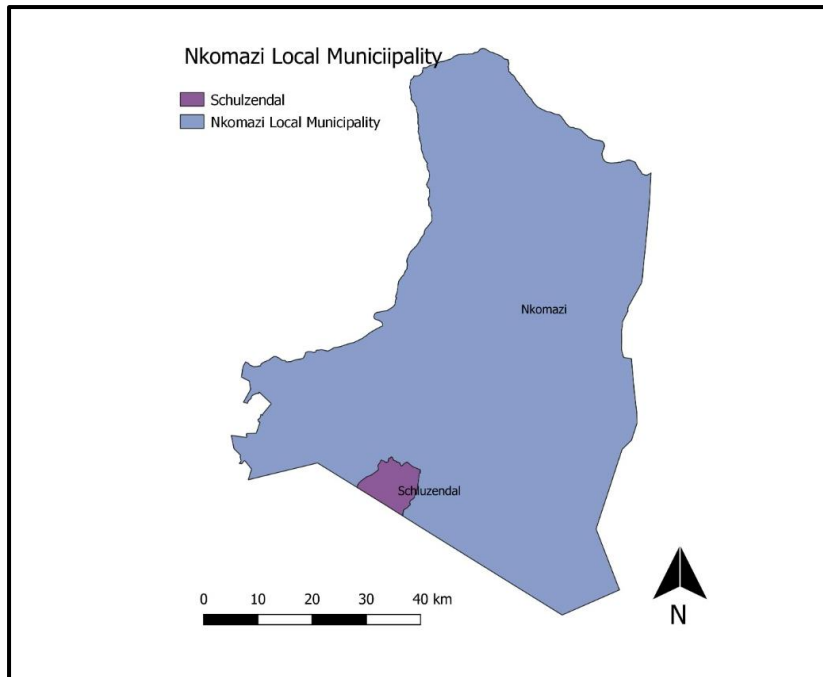


Map 1.3: Map of Ehlanzeni District Municipalities

Source: Esri (2021)

Nkomazi Local Municipality is rural in nature and has the highest poverty rate in the district. In terms of its settlement patterns Nkomazi local Municipality is serving the predominantly rural communities, only about 7.3% consists of the urban settlements and 89.8% are rural villages. In terms of its Water Services Development Plan, about 95% of its population is

classified as poor (household with a gross monthly income of less than R1100 per month) (Nkomazi Local Municipality, 2019) and most of these people reside in dense villages (76%), only 2% of the area is occupied by farmlands.



Map 1.4: Nkomazi Local Municipality highlighting Schulzental village

Source: Author (2022)

Map 1.5 above illustrates the Map of Nkomazi Local Municipality highlighting Schulzental Village that the study will mainly focus on.

1.8.2 Conceptual scope

This study focused on concepts relating to household water service delivery such as the concept of Spatial Planning, Water Governance, Potable Water, Service Delivery, Water Service Delivery Strategies and Water Sustainability. Studies have been done regarding water service delivery, but this research will propose spatial planning strategies for improving household water service delivery in rural areas of Nkomazi Local Municipality. Service delivery is broad; however, this research focuses on “household water service delivery”.

1.8.3 Theoretical scope

The theories that will be adopted in this study includes Central Place Theory, Principal Agent Theory of Planning and the Public Goods theory.

1.9 Definitions of key terms

This section provides the key terms that are used throughout the research. The purpose is to provide working definitions. This will assist in ensuring clearness on the meaning of the concepts below. The following key terms relate to spatial planning strategies for improving household water service delivery in rural areas:

Spatial Planning: Baker and Wong (cited in SA Cities Network 2019) defined spatial planning as an evidence-based planning approach that ensures that the agreed upon spatial future is captured in policy and is realised through projects and other interventions based on set objectives. Cilliers & Hestia (2018) concurred with this and supported that spatial planning is “considered the management of change, a political process whereby a balance is sought between all interests involved”. Lastly, even Drewes & Van Aswegen (2012) added that spatial planning is the “consideration of what can and should happen where, it investigates the relationship between different policies and practices across regional space and sets the role of places in a wider context”.

Water Sustainability: means water sufficiency: ensuring that there is sufficient water to meet multiple needs. It refers to consistent water provision in any climate change impacts, droughts and heavy rains. Water sustainability also implies that the economics of matching provision and demand are available, and that the water provision process is as efficient as possible (Aqua Tech, 2019). Globally,, having water sustainability means everyone has access to at least 20 to 50 litres of daily basic water.

Water Access: means the proportion of people who are able to obtain and utilize safe and improved sources of drinking water (Centers for Disease Control and Prevention, 2022).

Basic Service: means “a municipal service that is necessary to ensure an acceptable and reasonable quality of life and, if not provided, would endanger public health or safety or the environment” (Masiya, Davids, & Mangai, 2019).

Water Service Authority: means municipalities responsible for water provision (Water Services Act, 1997).

Household Water Service Delivery: means the delivery or distribution of the household water service through different means such as communal taps, household taps, boreholes, and water

trucks by the relevant water service authority to ensure access to water for all as a basic need (Tessema, 2020).

Water Governance: refers to the combination of political, social, economic, and administrative frameworks, both official and unofficial that shape how decisions are made regarding the development and management of water resources (Enqvist & Ziervogel, Water governance and justice in Cape Town: An overview, 2019).

1.10 Chapter layout

This section provides the chapters of the study which are as follows:

Chapter 1: Introduction and background

Chapter 1 provides the introduction and problem statement of the research. It also provides the rationale, aim and objectives of the study, the significance of the research, the scope, key terms and description of the study area. The chapter layout is also indicated together with the chapter summary.

Chapter 2: literature review

This chapter will review concepts, case studies and theories on spatial planning strategies for improving household water service delivery in rural areas to find out what other authors and studies state and show in relation to the research objectives.

Chapter 3: Literature review

Chapter 3 will review policy and legislative framework on spatial planning strategies for improving household water service delivery in rural areas to identify what other scholars and studies have revealed in connection with the research objectives.

Chapter 4: Methodology

A detailed research approach and design adopted in this study will be described in chapter 3. It will detail the nature of the data to be gathered, whether primary, secondary, or both and explain the data collection methods aligned with each data type.

Chapter 5: The condition of household water service delivery in Schulzendal Village of Nkomazi Local Municipality.

This chapter will analyse, present, and interpret data in respect to the study objective: the condition of household water service delivery in Schulzendal Village of Nkomazi Local Municipality.

Chapter 6: The challenges faced by Nkomazi Local Municipality in the delivery of household water services to Schulzendal Village.

This chapter will analyse, present and interpret data in respect to the study objective: the challenges faced by Nkomazi Local Municipality in the delivery of household water services to Schulzendal Village.

Chapter 7: Spatial planning strategies for improving household water service delivery in Schulzendal Village of Nkomazi Local Municipality.

This chapter will analyse, present and interpret data in respect to the study objective: spatial planning strategies for improving household water service delivery in Schulzendal Village of Nkomazi Local Municipality.

Chapter 8: Summary, conclusion, and recommendations

Chapter will provide the summary, conclusions, and recommendations of the research findings drawn from chapter 5, 6 and 7 with regards to the study objectives.

1.11 Chapter summary

This was an introductory chapter on the spatial planning strategies for improving water service delivery in rural areas of Nkomazi Local Municipality. It provided the introduction, rationale, the statement of the problem, the research aim, objectives and questions. The chapter further looked at the significance of the research, scope of the research, key terms, description of the study area, the chapter layout as well as the chapter summary.

CHAPTER 2: LITERATURE ON CONCEPTS, THEORIES AND CASE STUDIES

2.1 Introduction

This chapter presents relevant extant literature on spatial planning strategies for improving household water service delivery in rural areas. This spans from but not limited to concepts related to the study, theories and case studies related to the research focus. It begins with concepts related to the study.

2.2 Concepts related to Spatial Planning Strategies for Improving Household Water Service Delivery

The following concepts relate to the study:

2.2.1 Spatial planning

According to Munter and Osterhage (2018) the concept of spatial planning contains a fundamental idea about the state of affairs. It is characteristically abstract, sketchy, and not as detailed. It serves to work towards a target spatial structure that needs to be realised in the future and it essentially entails distributing various functions within a given space according to certain pattern and therefore involves the basics of spatial planning. Munter and Osterhage (2018) also illustrated the concept of spatial planning through an image overleaf.

This also features the concept of spaces with balanced functions which is usually seen as an alternative to the large scale functional and spatial division of labour. It is connected with the need to offer residents in all regional sub areas of the territory with good service delivery and living conditions together with good opportunities for recreations. To achieve this in rural regions, the densely populated focal points settlements should be redeveloped, and investment concentrated on suitable centres. The remaining areas of the territory/municipality will then benefit from this concentration of services thorough good infrastructural networks.

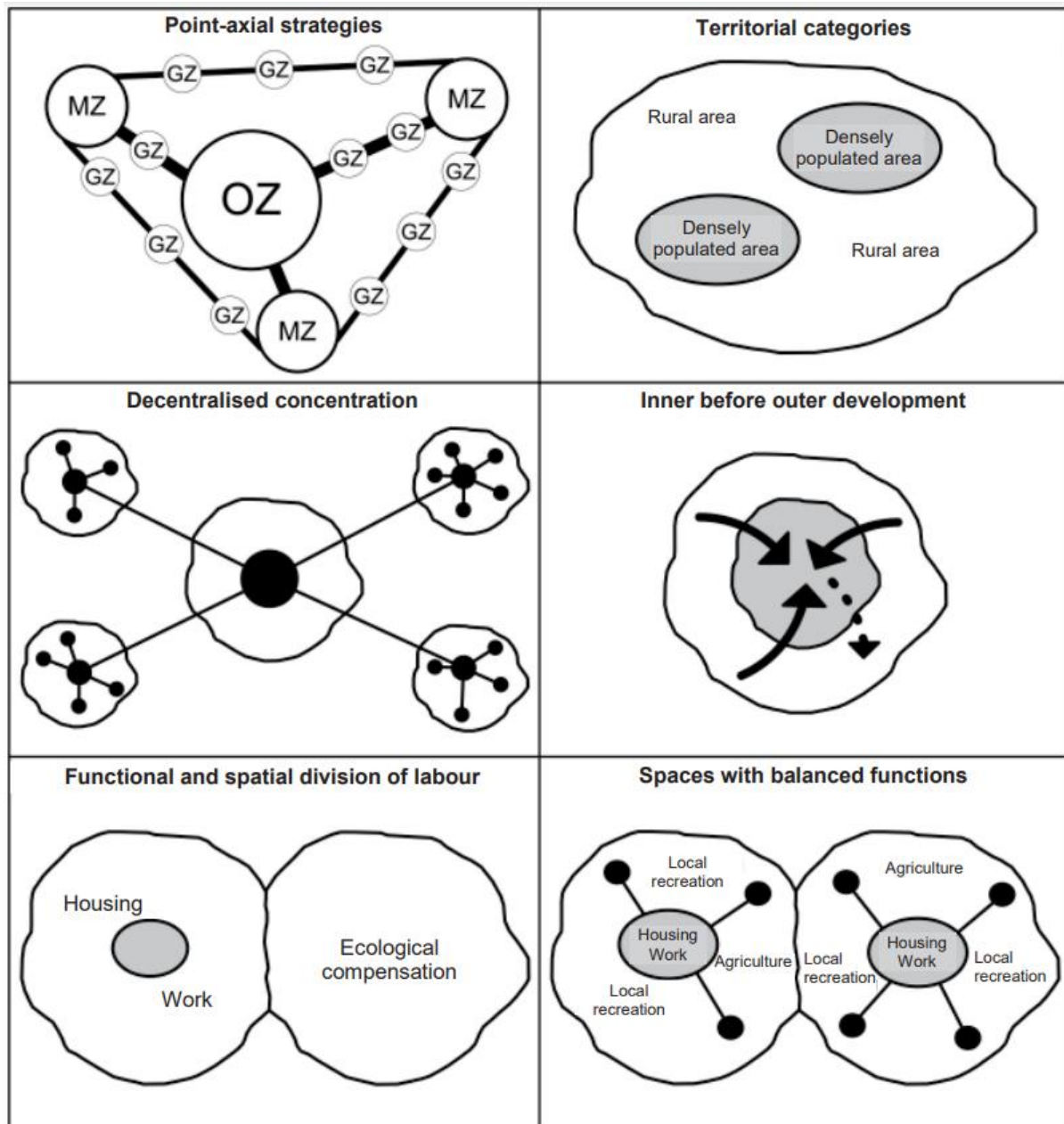


Figure 2.1: Concept of Spatial Planning

Source: Munter and Osterhage (2018)

Munter and Osterhage (2018) also added that the current benchmark when it comes to spatial planning concepts is the guiding principle of sustainable spatial development and the associated principles of spatial planning. Most concept developed in the 1960's and thereafter operate on various levels of abstraction involving the basic principles of spatial structure and general schemes based on the same principles particularly geared towards implementation. Distinctions should be made to take these differences into account between conceptualisation and concepts of spatial planning leading to a very close relationship between “concepts” and “guiding principles.”

The Concept of Categories of Territorial Units

According to Munter and Osterhage (2018), the concept of territorial categories was introduced within the federal laws of Germany where specific principles of spatial planning were standardised for the overloaded and densely populated areas and for the rural areas that were lagging in terms of service delivery. It originated during a time at which the spatial structure of the government was still marked by an urban-rural polarity which was virtually existing everywhere. So, this will be a good reference for the South African spatial planning that is already marked by the history of unjust spatial planning vividly highlighting the urban-rural polarity in the ground. The unwanted pattern of “passive regeneration” of rural areas by exodus into the densely populated can then be set against a policy of “active regeneration” through capital transfers to those areas.

This concept is also referred to as spatial categories and it served to divide the respective municipal areas into homogenous subareas with various characteristics and problem areas related to the spatial structure (Munter and Osterhage, 2018). Through this, a constellation of problems in relation to various functions including service delivery can be localised and the objectives and principles of spatial planning can be differentiated based on subareas. The two essential territorial categories or units are the densely populated areas as well as the rural areas.

2.2.2 Water service delivery strategies

Water service delivery strategies refer to structured plans developed to ensure the effective provision of water services to the population. According to Besley and Ghatak (2007), as referenced in Makanyeza et al. (2013), access to public services like water plays a critical role in determining the overall quality of life, a factor not solely reflected in per capita income levels. These scholars argue that effective service provision is a fundamental element in strategies aimed at reducing poverty. In fact, access to services is both a direct and indirect contributor to poverty alleviation and is central to achieving the Millennium Development Goals (MDGs). For this reason, implementing sound strategies for water delivery is essential to fulfilling the MDGs and realizing the human right to safe and sufficient water.

In their study, Makanyeza et al. (2013) identified various strategies that local governments can adopt to enhance water service delivery. These include increasing public involvement in municipal decision-making, fostering collaborative efforts between local authorities and

communities, establishing robust human resource policies with a focus on staff capability, and adopting flexible mechanisms to address customer complaints and service issues.

Additionally, Parce et al. (2014), as cited in Avolio (2016), emphasized that incorporating technological advancements is a crucial strategy for improving efficiency and reducing operational costs, especially in rural settings. Innovations in technology have the potential to enhance service delivery while minimizing risk and expenses. However, before implementation, it is important to evaluate the costs involved and weigh them against the expected benefits. Microfinance Institutions (MFIs) can also play a significant role by leveraging the strengths and governance structures of local municipalities. One of the key advantages in this context is the commitment of community members to support initiatives that benefit their communities, with personal reputation and social standing often motivating their participation.

Chao-Beroff (1999), also cited in Avolio (2016), noted that the cultural and moral frameworks found in rural societies, such as social unity, religious beliefs, and communal trust, can significantly enhance the success of private sector-led water services and microfinance-driven projects. These social values contribute to stronger implementation and acceptance of such initiatives at the community level.

2.2.3 Water Governance

In recent years, water governance has gained recognition on the global stage as a key element in driving sustained and meaningful progress toward the achievement of Sustainable Development Goal 6 (SDG 6) (Jiménez et al., 2020). Despite ongoing uncertainties around the practical definition of "water governance" and how to apply it, Jiménez and colleagues (2020) conducted a comprehensive review of the term's usage. Their work aimed to uncover how various actors interpret, apply, and engage with the concept in real-world contexts. Drawing on an extensive literature review and expert consultations, they identified and elaborated on the fundamental components of water governance, examining the qualities these components can exhibit when effectively implemented and how they align with the priorities and expectations of diverse stakeholders in achieving specific outcomes.

The study also developed a practical and operational framework that supports assessment and application of water governance across multiple domains, ranging from water and sanitation service provision to water resource management and transboundary water issues. The resulting insights offer actionable guidance for policymakers and practitioners in designing governance processes that are oriented toward action and capable of enhancing water governance practices.

Meanwhile, the Organisation for Economic Co-operation and Development (OECD) has outlined a set of principles intended to support the development of effective, outcome-driven water governance policies. These principles are structured around three core dimensions. First, effectiveness, which focuses on how governance mechanisms help establish clear, achievable, and sustainable water policy goals and implement them across various levels of governance. Second, efficiency, which evaluates how governance contributes to achieving optimal outcomes from water management efforts at minimal social cost. Lastly, trust and engagement highlight how governance can foster public confidence and ensure stakeholder inclusion through transparent, fair, and democratically legitimate processes (OECD, 2019).

2.2.4 Potable Water

Potable water refers to water that is safe for human consumption, sourced from both surface and underground supplies, and treated to meet both state and federal health standards. This treatment process ensures the removal of harmful elements such as bacteria, viruses, toxic substances, microorganisms, and fecal contaminants (Foundation, 2022). According to Dawood et al. (2021), enhancing the quality of potable water to guarantee access to safe drinking water is becoming increasingly critical, especially in light of rapid global population growth and the rising contamination of water sources.

In response to growing water scarcity, many water service providers around the world have started exploring alternative ways to supplement water supply. These efforts include delivering water in bulk during times of extreme shortage and distributing it intermittently (Simukonda et al., 2018; Ellawala & Priyankara, 2016, as cited in Salehi, 2022). As a coping strategy, households often rely on storage tanks to secure water during periods of limited or inconsistent supply. To address these challenges, water utilities in regions experiencing water stress have increasingly adopted Intermittent Water Supply (IWS) systems as a method for delivering potable water. Currently, over 309 million individuals across parts of Africa, Asia, and South America depend on IWS systems, which may operate on a daily, weekly, or seasonal basis (Li

et al., 2020, Loubser et al., 2021, Erickson et al., 2017, Kumpel and Nelson, 2016, cited in Salehi, 2022).

2.2.5 Service delivery

According to the Municipal Research and Services Centre (MRSC), service delivery involves the actual implementation of services such as waste collection and disposal or street lighting (Makanyeza et al., 2013). Delivering essential services is one of the core responsibilities assigned to local governments, as outlined in the 1998 White Paper on Local Government. Municipalities are tasked with meeting the service needs of their communities to enhance and maintain public welfare. Whitaker (1980), as referenced by Makanyeza et al. (2013), emphasized that to deliver quality services, government bodies must establish appropriate organizational frameworks and employ qualified personnel, who must be adequately supported to perform their duties. Furthermore, the provision of services plays a vital role in determining the quality of life and is instrumental in the pursuit of the Millennium Development Goals (MDGs). As such, ensuring access to reliable and sustainable services, including water, is crucial for community well-being.

In many rural regions, limited access to safe drinking water and low performance of water supply systems remain significant obstacles. Achieving the SDGs presents additional challenges, particularly in reaching underserved rural populations and maintaining long-term service provision. A cross-country approach can help uncover effective strategies and common obstacles in building sector capacity and developing durable service delivery models tailored for rural settings. This involves acknowledging the shortcomings of demand-responsive methods and the growing diversity of water service management models. It also highlights the need for continuous support to rural water providers and the importance of supportive policies and institutional frameworks that extend beyond local communities. To adopt a more integrated and practical model for sustainable rural water services, an analytical tool can be used to assess current water supply systems. This would allow for the development of targeted policy recommendations based on each country's specific stage of sector development (World Bank Group, 2017).

2.2.6 Water Sustainability

Water sustainability involves ensuring a reliable and adequate supply of water to meet the diverse needs of society, including agricultural, urban, and industrial sectors (Aqua Tech, 2019). It also encompasses the ability of water systems to withstand the impacts of climate variability—whether through prolonged droughts or excessive rainfall leading to floods. Moreover, sustainability in water usage includes economic considerations, where the balance between supply and demand is maintained through cost-effective and efficient delivery systems.

Globally, achieving sustainable water management means securing access for every individual to a basic daily supply of clean water, typically estimated between 20 and 50 litres per person. This aligns with the United Nations General Assembly’s declaration of access to safe and clean drinking water and sanitation as a fundamental human right essential for a dignified life.

The concept also emphasizes integrated and strategic water resource management due to increasing and competing demands. Effective sustainability strategies aim to deliver sufficient water in both quantity and quality without jeopardizing the ability of future generations to meet their needs (Aqua Tech, 2019).

Promoting sustainable water use requires establishing systems that track and optimize water efficiency. Such frameworks help water service providers align their operations with the three core dimensions of sustainable development: social—ensuring communities thrive based on shared values; ecological respecting environmental limits; and economic—maintaining service levels that support a decent standard of living (Hak et al., 2018, as cited in Morris, 2019).

This structured approach not only provides benchmarks for evaluating progress but also fosters public support for policy measures aimed at addressing water sustainability issues. Further reinforcement can come from robust legislation that protects water sources, emphasizes sustainable practices, and reduces pollution. These measures should align with long-term goals for preserving water quality and availability (Commission of the European Union, 2000, 2012; Bithas, 2008, as cited in Morris, 2019).

2.3 Theories related to Spatial Planning Strategies for Improving Household Water Service Delivery

The following theories relate to the study:

2.3.1 Central Place Theory

Munter and Osterhage (2018) trace the origins of this theory back to Walter Christaller's work in the 1930s. Over time, it evolved into a foundational element of spatial development strategies across Germany's non-city states. However, after about twenty years, during a period of growing doubt toward traditional planning models, it came to be viewed as an outdated, overly rigid regulatory framework. Despite this shift in perception, a working group under the ARL (Academy for Spatial Research and Planning) concluded that the theory still offers a relevant and practical structure for applying the core ideas of sustainable development in planning practices. Experts acknowledged its usefulness, particularly in guiding infrastructure decisions amid changing population dynamics.

The Central Place Theory primarily focuses on its value for organizing and directing large-scale retail development. Yet, it has faced criticism, especially in some federal states, where its central place classifications are seen as outdated and not reflective of current realities, prompting calls for revisions.

As a model based on linear and nodal concepts, the theory significantly shapes the understanding of spatial planning's organizational and strategic roles (Munter and Osterhage, 2018). It emphasizes that development should be concentrated around strategic node central places arranged in a hierarchical network, to guarantee residents across a region access to essential services within reasonable proximity. This approach typically involves a three-tier system composed of basic, intermediate, and higher-order centers, along with their surrounding service areas. In applying the theory today, the dominant perspective is that central place designation, particularly for large municipalities, should be tied not to the total land area but to specific clusters of activity within municipal boundaries.

In this study, CPT is crucial because it helps analyze the spatial distribution of water services within Nkomazi Local Municipality. It helps explain why water services are concentrated in larger urban areas and why smaller villages like Schulzendal may be underserved.

2.3.2 Public Goods Theory

Public Goods Theory. The theory of public goods is developed from the field of economics and has been used to solve many challenges emanating from the provision of goods. This theory states that public goods are different from private goods because they share two qualities which of publicness and indivisibility (Lee & Best, 2017). Public goods are characterized by their indivisibility, meaning they cannot be broken down into smaller units or purchased in varying amounts by individuals. Additionally, because they are accessible to everyone, it is not possible to prevent others from using or benefiting from them once they are made available. Essentially, public goods must be equally accessible to all members of a given community, either everyone benefits, or no one does. These goods are typically considered free because it is not feasible to exclude individuals from their use. The only potential expenses involved pertain to the processes required to make the good available, such as obtaining, transporting, or distributing it, not the good itself.

Classifying water as a public good has received an equal measure of debate. Water is not indivisible and public in the strictest sense, leading to occasional contestations that water is not a public good. However, water is still regarded as public good for some reasons including the fact that water is a common pool resource. In some instances, water can be regarded as a private good because in urban areas bottled water is sold but this does not prevail in rural communities. However, this does not dispose of the question of whether bulk water, water in its natural condition should be treated as a public good. The concept of water as a public good can be viewed from a paradigm of social characteristics such as culture wherein public good is determined not just by its physical characteristics, but also by its social and economic characteristics. In rural communities' cultural underpinnings dictate that water should be a public good. Moreover, the costs to exclude others would be so high that it is impractical to exclude others from access to the good. In this case the government takes ownership, or collective management is preferred for the effective delivery of water services.

For this study, the theory is used to analyze the challenges of providing a public good (water). It also helps explain why private provision is often ineffective and why municipal governments should play a key role in distributing water.

2.3.3 Principal Agent Theory of Planning

The dynamic of accountability and oversight between elected officials and bureaucrats is frequently interpreted using the principal-agent model. This theory is one of the most prominent frameworks used to understand issues of control and responsibility in public administration (Gailmard, 2010; Schillemans & Busuioc, 2014). The government is elected by the people to act as custodians of the people. With this mandate, government officials are expected to plan the allocation of resources and distribution of vital services such as water, roads, streetlights and public spaces. Against this reason, Döhler (2018) argues that “the political-bureaucratic relations became the field in which the principal-agent theory and its related approach and framework, flourished most”. PAT is based on the fundamental idea that the agent often pursues their own interests and may behave opportunistically, whereas the principal is assumed to act ethically and must therefore impose limits and oversight to manage the agent’s actions (Döhler, 2018). Roach (2016) argue that “an agent may engage in elusive behaviours which are self-serving and by so doing, an agent engages in non-compliance activities. In this way, the chief principals (public) are sidelined from enjoying the resources or even shortages.

The challenge is that when the agent is involved in non-compliance activities, through diverting their attention away from achieving the principals’ primary objectives outlined and expected, to secure their secondary interests. The PAT is often understood as demanding the principal to enforce compliance (Gailmard, 2010). In this way, the actions of the agent are restrained to ensure that the bureaucrats comply and do not deviate beyond the parameters laid down by the public representatives through laws and rules (Tummers et al., 2018). In terms of the above, officials are obligated to comply, conform and account to political leaders, while oversight entails the responsibility of the political leaders to ensure that officials adhere to the predefined rules, procedures, standards and guidelines for providing public services such as water. In this regard, oversight is an essential requirement to ensure the public receive an adequate supply of water.

Government service delivery allocates the majority of day-to-day management and operational responsibilities to local or sub-national government actors, or a government corporate entity. This could be in the form of a publicly owned utility covering a rural town or multiple communities, or local government departments or village governments that manage more discrete, community-scale water supplies. In theory, the state (acting as service authority) can

more easily mandate that government managed water supplies provide equal levels of service compared to other service providers. However, local governments continue to be beset with low human resource capacity, weak financing, poor coordination and regulation, and even conflict of interest that hinders their ability to deliver adequate water services, let alone address inequalities, especially in more remote rural areas.

In the context of water service delivery, the municipality acts as the agent implementing policies and distributing resources, while the citizens of Schulzendal are the principals, relying on the municipality to provide essential services. The theory helps address accountability issues, such as corruption or inefficiency, that hinder water delivery. For the purpose of this study, The theory helps examine the relationship between local government (agent) and the community (principal) in terms of accountability, service quality, and governance issues. It can be used to analyze how municipal officials' decisions may not always align with the community's needs due to factors like incentives or lack of transparency.

2.4 Case Studies related to Spatial Planning Strategies for Improving Household Water Service Delivery

This section will provide case studies on household water service delivery from different perspectives all over the world. This will be based on cases that have existed and will also look at how different governments and stakeholders have tried to combat such problems and the effective solutions thereof. This will range from international case studies, African context case studies and lastly the local case studies from South Africa.

2.4.1 Strategies to Improve Water Service Delivery in Canada: Alberta

A study by Nicol & Nicol (2018) looked at the rural co-operative water systems and the role they play in rural water management within Rocky View County, a rural municipality adjacent to the city of Calgary. The County experienced a significant water demand pressures from the regional population growth. But due to the Alberta's water licensing allocation system, the increase in demand and the Bow River Basin could not be met by acquiring additional water licenses. The study further presented preliminary exploration into the views of three different groups i.e. The water managers co-operatives including the private systems, housing developers and the Rocky View County councillors. The views gathered were found to be in relation to the extent of the water challenges, the present, and the future ability to manage them, potential consequences, and possible solutions. One of the key findings revealed that the water

managers expressed lack of confidence in adapting to water challenges and a lack of common understanding amongst the three groups about the seriousness and consequence of the challenges involved. When it comes to meeting the challenges, a solution that presented the greatest support was the development of a regional umbrella water management organization.

Canada tried to solve water provision challenges through water licensing allocation system, but this was not enough to completely solve the problem. A preliminary exploration into the views of cooperatives, the private system and housing developers then followed with the results showing the extent of the water challenges. This study differs from this case because unlike a well-developed nation and city of Alberta, financial capability is a big obstacle for a developing country such as South Africa, especially in local government as the Municipality of Nkomazi is always prioritising projects due to lack of finances. This ends up in the municipality only implementing projects that focuses on human basic needs only and the rest are usually pushed to future financial years.

2.4.2 Strategies to Improve Water Service Delivery in Asia: Timor Leste

Willetts (2012) pressed that the sustainability of rural water service provision in Timor-Leste required orientation of the sector from an infrastructure focus to a service delivery approach. A report of a research that was undertaken through BESIK (Timor-Leste's Rural Water Supply and Sanitation Program (RWSSP) which details how such a transition can be approached. The main focus would be on institutional options to improve operation and maintenance of rural water systems. In an attempt to meet the need of rural water sector, Timor-Leste government has increased capital investments only for it to be undermined by the absence of a recurrent budget allocation to cover operation and maintenance of community-based management models which are recognized internationally and have also been directly experienced in Timor-Leste. This led to a minority of rural water systems to fully function for just one year after their installation.

The existing institutional framework places communities as responsible for operation and maintenance for small systems giving joint responsibility to communities and DNSA for larger systems that covers more than three communities. The suggested improvements to this model included better developed planning and support processes for communities to undertake operation and maintenance support to professionalise and formalise water management groups. For DNSA to effectively play their role in the joint management, planning and budgeting will

be required combined with re allocation of existing district level human resources and on-going staff capacity building. This also includes technical skills and a major information gap regarding actual maintenance requirements and costs needed to be filled through commissioning an appropriate study of this nature.

The Nkomazi Local Municipality case indicated a lack of access to tap water indicating an infrastructural challenge. The main problem was not necessarily the lack of resources even though water should be used with concern as a scarce resource in the country. But it was that its distribution or provision system was not fully functional in some of the areas within the Municipality with no water for prolonged periods even though there is already an implemented system to solve such a problem. So, this indicates that there has been an intent to solve such a problem for a long time, but the problem still persists despite such actions. So, this case differs from Timor Leste's in such a manner.

2.4.3 Strategies to Improve Water Service Delivery in Australia

As one of the most vulnerable countries in terms of severe droughts and water scarcity in the world, Australia's water supply is affected by high variability of water availability (Burdack, Biewald, & Lotze-Campen, 2014). Severe and extended droughts are usually followed by massive floods within a single decade as was the case in 2001 to 2010 and this has led to planning for water provision subjected to uncertainties since it is difficult to predict water supply. This issue led to the development of restrictions on water use (caps) combined with flexible water markets to respond to fluctuations in water availability.

The geographical scope of this case study compared to that of Nkomazi Local municipality vastly differs due to climate and weather because it was evident from the beginning that water availability in Australia is affected by severe droughts followed by heavy floods. While in Nkomazi which is found within the Sub-Saharan Africa things are a bit different. When it comes to the way the two countries tried to solve their problems, there is another structural or systematic challenge as Australia is already a developed country while in Africa the main challenge to most problems is finances and the backlogs that currently exists. This means that solutions for most problems are clear, but the challenge remains on how they will be carried out.

2.4.4 Strategies to Improve Water Service Delivery in China

In China, local land use management schemes have been associated with water supply. Cai et al. (2020) note that areas that rely on water intensive livelihoods experience water scarcity whereas those that do not use water are water abundant. However, the most important aspect of a land use scheme is to ensure that water bodies are preserved and the activities that take place on the land positively contribute to water resource conservation. Water is an important resource that should be diligently managed by authorities. According to Jiang & Chan (2013) cited in Cai, et al. (2020), China's land use scheme seeks to achieve at least two objectives of ending poverty through intensive agriculture and improving water supply in rural communities.

China tried to solve its water challenges through land use management schemes. An innovative approach that seems to be years ahead of what most places in South Africa has shown. This is because most Municipalities are constrained financially and cannot afford to implement state of the art solutions to their problems but will have to rely on prioritisation and only focusing on the projects that would make sure that at the very minimum, every citizen gets access to clean water. This is because this is the benchmark to meet SDG and MDG to eradicate extreme poverty.

2.4.5 Strategies to Improve Water Service Delivery in Uganda: Kabarole District

With the drinking water services section in Uganda in its early stages of the nationally planned transition, the main aim is to move from a paradigm-based community managed point sources and move towards one of the professional utilities of a piped network (Houston, Gaskin, Moriarty, & Watsisi, 2021). The implementation of such a transition was studied in Uganda's Kabarole District where a system's approach was used to assess the sustainability of the different service models. The level of services used household assessment and infrastructure surveys which were supplemented by a management assessment, key informant interviews and stakeholders' workshops. The utility models used in Kabarole managed to outperform the community management model with the existing national utility demonstrating a greater maturity and performance than the newer umbrella utility. On the other hand, the community management model was relatively well defined in policy and planning frameworks but was poorly implemented with less than 20% of the community management structures operational at water points. The water sector was then undergoing a process of consolidation of service

delivery under a smaller number of larger providers. This trend has been observed in other countries as they would progress towards universal supply.

This African context case study relates to the study area (Nkomazi Local Municipality) since both are found within the same African continent region within the sub-Saharan Zone. Climate and weather influence on the water scarcity is almost the same meaning that such case studies will present similar challenges to the study area. Uganda used a systems approach that was discussed above in their attempt to solve water delivery challenges. They combined this with different models and managed to find a way to start dealing with their water service delivery. Meanwhile, in Nkomazi local municipality, strategies are still in action on what best way should be adopted to solve water services delivery problems. So, this shows the difference in approach from the two countries on how they solve the water service delivery challenge despite both being from the same African continent.

2.4.6 Strategies to Improve Water Service Delivery in Tanzania

Similar to many countries in the Sub-saharan regions, the Tanzanian government is implementing an ambitious rural water supply and sanitation plan (RWSSP) to increase access to water from 50% to 90% by 2025 (Jimenez & Agusti, 2011). The involved study exploited water point mapping (WPM) data and evaluated the principles of the design of the program and revealed challenges for the rapid increase of access to water. The data of water points that was analysed counted for 15% of the country's total rural population (Jimenez & Agusti, 2011). The results revealed the inaccuracy of the baseline used for the program design, the difficulties faced by undeserved districts in keeping the water points functional, and the differences between the expected and real long-term functionality of the water points, more especially for hand pumps, were the primary threats to the achievement of the targets. The study also suggested that more effort be put into capacity building and the supervision of construction with the support of the community owned management during the first years of operation. The supply of water in rural communities is driven by private-and community partnerships such that the Ministry of Water Supply and Sanitation assigned the newly form community organisation, RUWASA which is working with various NGOs to provide water to rural communities (Global Waters, 2020). This means that the role of government is slightly reduced as communities take the lead in making sure that water supply is sustainable. However, from a policy perspective, the government still retains the authority to plan for land use management systems. The beauty of the model for water supply in Tanzania is that most of the planning is

done with the community so providing solutions for water supply is not only viewed as a government mandate.

Tanzania directly tackled their water service delivery challenges by increasing supply means to the public. This was done through procurement of water service delivery infrastructure which seemed to be the fastest way to address their challenges. The same problem has been experienced in Nkomazi Local municipality and the apparent solution to increase water access to all would be to supply homes that has no tapped water. This can be done via different strategies considering the challenge that it is financial constraints that always stand in the way of such projects (Nguyen, et al., 2019). The difference in this instance to this study lies in the background and the available strategies that will be efficient and effective towards solving the water service delivery challenges.

2.4.7 Strategies to Improve Water Service Delivery in Ghana

Kumasi (2020) highlighted that Ghana has a lucrative land use schemes which outline strategies for deriving a sustainable functionality of water infrastructure, however the country is still fraught with several challenges regarding water supply for its rural communities. Kumasi (2020) further argues that strategies fail when they are not executed appropriately, hence suggests the need for systemic monitoring and evaluation of water infrastructure. Moreover, Ghana has a decentralised land use and planning system which allows local municipalities to effectively plan for their water needs while ensuring that other services such as sewer systems are adequately serviced.

The apparent difference from the case above lies in the use of Land Use Schemes as a tool to address water service delivery challenges. Unlike within a South African context where Land Use Schemes mainly control land use activities instead of accelerating and maintaining water service delivery to the public. As a result, this presents another opportunity that this study considered as a means to tackle the ongoing water service delivery challenges.

2.4.8 Strategies to Improve Water Service Delivery in Nigeria

A study carried out in Nigeria indicates that rural communities are experiencing an alarming state of water deprivation. Abote (2019) argues that the shortage of water supply in rural communities is largely caused by policy gaps on land use and water supply. Unlike in South Africa, land use policies in Nigeria allow communities to jointly manage water resources and

ensure that every household has enough water. The community-based service providers are constrained by several policy gaps that negatively impact on the quality and sustainability of rural water supply in the country (Abote, 2019). It is further argued that rural water interventions suffer from a high rate of failures due largely to a weak institutional framework in the water supply sector. This simply points to lack of, or ineffective policies of land use planning from authorities. To abate the dire water situation is vital that authorities mobilise stakeholders and work together to address the loopholes created by the existing policy gaps.

Even though Nkomazi Local municipality is an authorised Water Service Authority, this has proved not to be as effective as it goes hand in hand with the existing policies within their area of jurisdiction. So, it is clear in this case that the difference in using land use policies as a tool to facilitate water service delivery in Nigeria proved to be effective. Meanwhile in South Africa, the Nkomazi Local Municipality is still in search for an effective way to bring about an effective water service delivery approach for all.

2.4.9 Strategies to Improve Water Service Delivery in Kenya

Kenya is home to a large number of rural community residents in Africa, yet its water supply has reached a crisis level. According to Otieno (2020) water supply in rural communities of Kenya is largely informal and the local authorities have tried to assist but in vain. Moreover, the local community Water Association lack the required skills and finance to maintain water sources. At government level local authorities have a mandate to ensure that they have solid land use schemes which are useful for determining the distribution of water services to the communities. In addition, these associations lack professional management capacities and business orientation to manage the water schemes sustainably. Alternative approaches for management including the use of Public-Private Partnerships have been considered but they still fall short of capacity to implement their actions in the realm of the land use management schemes which are found in various counties.

The lack of capacity at community level is serious challenge in the management of water resources as well as improving access to water. The argument that communities' resort to alternative forms water supply seems to be validated considering the prevailing acute shortage of water services in rural communities. It is important at this point to note that the land use schemes in Kenya are mere documents which are seldom implemented and the chances of these being inadequate are high. As a matter of fact, the land use schemes do not have a clear

delineation of activities for water supply, and this affects proper planning for the water supply including infrastructure development.

This case study is similar to the Nkomazi Local Municipality because both cases are taking place within an African region where the most prevailing constraint to service delivery is finances (Peletz, 2018). The only difference in most African countries when it comes to water service delivery and service delivery in general revolves around financial constraints, background or environment, and the management strategies, procedures and approaches that African countries use to deal with their problems. This remains true even if water scarcity plays a role. Because Africa is generally a water scarce continent in itself (Hasan, 2019). Despite all this, other countries like the United States have shown cases of water scarcity but due to their management procedures and other water conservation ideas (Friedrich, 2018).

2.4.10 Makana Local Municipality: South Africa

A national scale context of water service delivery in South Africa was used as a perspective to better understand issues related to household water supply at the local scale of Makana Local Municipality (Weaver, Hamer, Keffe, & Palmer, 2017). The fundamental principles, according to RSA (1998) cited in Weaver, et al (2017) for South African water resources management and protection are equity, sustainability, and efficiency. These principles work as a framework for the core objective of water service management systems which are centered around reliable supply to users with sufficient quality and quantity of water. The Department of Water and Sanitation (DWS) uses this objective eloquently with their early slogan ‘some for all, forever.’ This slogan managed to capture the principles for equitably distributing a finite source while redressing historical imbalances. The municipalities mostly challenged with the responsibility of household water supply in South Africa are Category B2, also known as Local Municipalities with large towns as their core (MDB 2013).

Makana Local Municipality (MLM) is a clear example of a WSD-challenged Local Municipality and this case explores the MLM areas where water service delivery failure is hardest felt and harbours the majority of the rural population of which most are poor and lack the social and financial capacity to mitigate against water supply shortcomings. The Municipality’s responsibilities further contribute to the complexity of the WSD within its jurisdiction as the rural areas also require municipal support but are often neglected as the municipality focuses much of its attention on urban areas like Grahamstown and its numerous

challenges where water supply is prominent. MLM has experienced repeated water supply issues that goes as far back as two decades and historical records show that water supply issues have plagued the Municipality through its early days as far as the 1813s (Mullins, 2011, cited in Weaver et al, 2017).

Water shortages within the municipality in conjunction with public perception of poor water quality has led to an increase in public frustration and breakdowns of trust between the public and the MLM culminating in several service delivery protests that peaked in 2013 (Grant, 2014, cited in Weaver et, al, 2017). The provincial government then declared the MLM as dysfunctional and its water crisis drew attention of the office of the president leading to the intervention by the Presidential Infrastructure Co-ordinating Committee to investigate the issue and diagnose solutions (Yako, 2015, cited in Weaver et, al, 2017). The Makana Water Intervention co-ordinated by the DWS was then established and the water crisis became a one emergent manifestation of the dysfunctional MLM system that contributed to the municipality being placed under political administration in October 2014 and was in the care of a provincially appointed administrator. The Institute for Water Research at Rhodes University conducted a case study at MLM as part of a larger Water Research Commission-funded project titled ‘Towards practicing a new paradigm (TPNP)’. The TPNP sought to develop different forms of praxis to improve integrated water resource management processes in South Africa.

Nkomazi Local Municipality, as a rural based municipality presents a different case and has several villages where water service delivery issues remain prominent. Unlike Makana Local Municipality, Nkomazi has no city cores that usually diverted financial attention away from rural areas in the case of Makana Local Municipality. So, this characteristic has been prominent in Category B2 local municipalities, but Nkomazi Local Municipality presents a different case within that respect (MDB 2013). This characteristic would mean that it will be easier for the Nkomazi local municipality to develop focus-based strategies that will comprehensively target rural areas with water service delivery challenges.

2.4.11 Department of Science and Technology: South Africa

A case study by the Department of Science and Technology (DST) titled “Accelerating Sustainable Water Services Delivery (ASWSD)” identified a number of challenges in relation to water services for both WSA and WSP. Challenges identified in the selected villages included the availability of water sources, administrative challenges, issues that relate to policy,

and political interference. It further revealed that for many rural community's water sources and infrastructure are available, but not maintained, as a result become unusable and thus non-operational. It was also clear from the study that a lack of capacity within municipalities has a way of negatively impacting on issues of operation and maintenance and other issues required in facilitating service provision, leaving municipalities unable to attend to these challenges as they would like to. The study concluded that rural municipalities are struggling to provide services to communities as per constitutional mandate, and thus a lot more work and effort need to be put forward to ensure that the function of providing services is undertaken and that the goal of ensuring access to water services is attained as expected. Yet another study by Mothetha, et al (2018), also focused on the challenges of rural water supply in rural areas of Limpopo province

The department of Science and Technology research has revealed that there has been a water availability issue within most rural South African municipalities even though water provision infrastructure has been provisioned. This means that all the budget allocated for such infrastructures will be lost because for them to be maintained, they will need to be fully functional. On the other hand, Nkomazi local municipality situation has indicated lack of tapped water due to no water service delivery infrastructure within the Schulzental village that this study focused on. This means that to solve such a problem, a different approach will need to be used compared to the one that was used in Department of Science and Technology's case study.

2.4.12 Midvaal Local Municipality: South Africa

According to the Midvaal Land Use Scheme (2019) besides local governments, land use can be affected by economics and broader policies, such as transportation, state agricultural policies, watershed management policies on state land, and state and federal environmental regulation that have the potential to impact water quality. In this regard, land use decisions can potentially affect both water quantity and water quality and in reverse, similar decisions regarding water management can potentially affect land use (Rohr & Fourie, 2014). Nevertheless, the decisions are not always well-coordinated, and it is difficult to integrate land use and water planning decisions on local, regional, and nation-wide levels. Therefore, optimization of the land and water resources, while balancing sometimes conflicting goals such as protection of the environment, will require careful land use and water management decisions

that integrate local, regional, and national goals and objectives. These should be framed in the realm of water rights which are constitutional.

Midvaal Local Municipality has demonstrated a way for a Land Use Scheme to affect water service delivery indirectly. This is because most of the activities that take place on land will end up requiring water at some point. But this case differs from Nkomazi Local Municipality as it is in an urban setting where there are mixed use zoning land use activities with high density stands. So, such a setting will require a lot of water to be delivered affecting the water service delivery in one way or another (Bai, 2019). Looking back at the study area of this research, it is in a rural area and the challenges there and solutions that could be implemented will vastly differ.

2.5 Chapter Summary

This chapter presented relevant literature on concepts, theories and case studies. For easier context and understanding of the subject matter of this research, the next chapter will focus on literature on policy and legislative framework in respect to the study.

CHAPTER 3: LITERATURE ON POLICY AND LEGISLATIVE FRAMEWORK

3.1 Introduction

This chapter presents relevant literature on policies and legislations related to spatial planning strategies for improving household water service delivery in rural areas. Policies and legislations are significant in planning, and they guide planners in making informed decisions. It is important to review international policies and legislations that guide household water service delivery in rural areas. This study will review international, South African National and local policies and legislations.

3.2 International policies and legislations on household water service delivery

The following international policies and legislations related to household water service delivery in rural areas are included in this section:

- Sustainable Development Goals (SDG)
- African Water Vision 2025
- SADC Regional Water Policy

3.2.1 Sustainable Development Goals

The Sustainable Development Goals are a collection of 17 intertwined global goals meant to be a "shared blueprint for peace and prosperity for people and the planet, now and into the future" (United Nations, 2017). The SDGs were launched in 2015 by the United Nations General Assembly and are aimed to be accomplished by the year 2030. According to United Nations (2017) "Clean water is a basic human need, and one that should be easily accessible to all. There is sufficient fresh water on the planet to achieve this. However, due to poor infrastructure, investment and planning, every year millions of people, most of them children — die from diseases associated with inadequate water supply, sanitation and hygiene." Therefore, SDG 6 deals with the right to water and sanitation services for all. It aims to ensure availability and sustainable management of water and sanitation for all and also to achieve universal and equitable access to safe and affordable drinking water for all by 2030. SDG6 addresses the need to improve household water service delivery in all areas worldwide, whether urban or rural.

3.2.2 African Water Vision (AWV) 2025 Framework

To counter the predicted long term decline in water security in Africa during the start of the 20th century, the Economic Commission for Africa (ECA), the African Development Bank (ADB), and the African Union (AU) released the African Water Vision 2025 to highlight the existing issues and the challenges of the past decade regarding water resources in 2000 and formulate a framework for action (Mutschinski & Coles, 2021). The main aim of the AWV 2025 was to establish a transition towards an “Africa” where there is equitable and sustainable use and management of water resources for poverty alleviation, regional cooperation, socio-economic development, and the environment by 2025. This aim was developed through a multi stakeholder process based on the Dublin Principles and was driven by the World Water Vision independent commissions report and the growing awareness of the impending impact of climate change (Rijsberman, 2000, cited in Mutschinski & Coles, 2021).

Reliable and safe water resources for rural communities in Africa continues to be at the pinnacle of challenges facing African communities in the last 20 years, especially for smallholders, agricultural sector productivity, food security and economic development (Mutschinski & Coles, 2021). Addressing such challenges requires a well-structured policy in the water sector and implement commitments and investments effectively and ultimately ensure the quantity and quality of water supply. The AWV 2025 for Africa was commissioned in 2000 by the World Water Council to create a framework to target these aspects in Africa. Mutschinski & Cole (2021) examined the progress towards achieving the AWV 2025 after two decades through initiatives, government policies and water strategies that have been implemented. This took a close look at the top-down impact of the AWV 2025 in the national context of Kenya and its rural population. Even though the water sector has evolved since 2000, it is still difficult to meet international standards both at the continental and country wide level. To improve this, continued efforts to strengthen good governance in the water sector, to address the financial challenge associated with the expansion of the infrastructure and development of decentralized approaches to the provision of water supply.

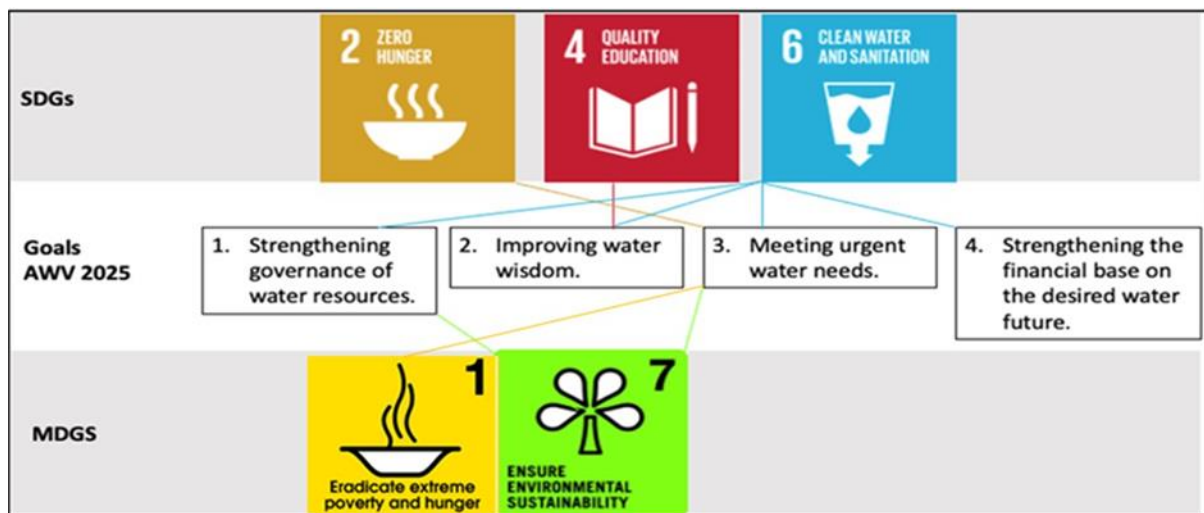


Figure 3.1: The alignment of the AWW 2025 with SDG and MDG

Source: Cosgrove & Rijsberman (2000)

The AWW strongly highlights issues surrounding water availability and security for communities in Africa and notes that it is closely linked to factors of food supply, human health, prosperity, protection of the existing ecosystem and economic development. The framework for AWW contains four main goals based on 5 SDG's as denoted in the figure above and aims to achieve them by 2025 to improve water management in Africa (UNECA 2003, in Mutschinski & Cole (2021). Additionally, the Millennium Development Goals (MDG) and the Sustainable Development Goals (SDG) were established alongside as global aims and five of the SDG played a central role in aligning the AWW with the SDG and MDG.

3.2.3 SADC Regional Water Infrastructure Programme

The main requirement for the SADC regional infrastructure programme was reaffirmed in the Regional Indicative Strategic Development Plan 2003 with its two main specific targets namely: To develop by 2015, water infrastructure needed to double land under irrigation and halve the proportion of people without access to drinking water and proper sanitation (SADC, 2010). The overview of the Regional Water Infrastructure Programme (RWIP) discusses issues such as the enabling environment for infrastructure development, the institutional framework, the shared watercourse institutions including river basin organisations, the SADC water infrastructure programme, the regional water supply and sanitation programme, the community livelihoods and demonstration projects and the regional strategic water infrastructure development programme. The SADC member states intend to bring forth the RWIP through the following programmes:

3.2.3.1 Enabling environment:

The enabling environment was established through the regional strategic action plan on integrated water resources management with the main aim of developing the SADC Protocol on shared watercourses.

3.2.3.2 Institutional Framework

This includes institutional development and strengthening as a major component of enabling environment as it is a required necessity of the infrastructure development programme. The Institutional framework brings together member states and international cooperating partners under the coordination of the SADC secretariat.

3.2.3.3 Shared Watercourse Institutions

Most of SADC watercourses are shared by two or more countries and as a result, it was necessary to develop institutions for the management of transboundary water courses. Shared watercourse institutions have been recognised as the main vehicle for the implementation of the SADC water programme at a river basin level.

3.2.3.4 Community Livelihoods and Integrated Water Resource Management (IWRM) Projects.

This covers projects that are necessary to demonstrate and promote the benefits of IWRM at community level. This is crucial for the implementation of physical water infrastructure projects. This includes small projects such as the establishment and rehabilitation of small irrigation water supply and sanitation schemes as well as catchments management projects.

3.2.3.5 The SADC Water Infrastructure Programme

This programme is comprised of the three programmes namely, Regional Water Supply and Sanitation, Community Livelihood and IWRM Demonstration Programme, and Regional Strategic water Infrastructure Development Programme.

3.3 South African National policies and legislations on household water service delivery

The following South African policies and legislations related to household water service delivery in rural areas are included in this section:

- Constitution of the Republic of South Africa 108 of 1996 (Act 108 of 1996)
- White Paper on Local Government (1998)
- Spatial Planning and Land Use Management Act (SPLUMA)
- National Development Plan (NDP)
- Water Services Act 108 of 1997
- Municipal Systems Act 32 of 2000
- Municipal Finance Management Act 56 of 2003
- Free Basic Water Policy
- Strategic Framework for Water Services
- Batho Pele Principles

3.3.1 Constitution of the Republic of South Africa (Act 108 of 1996)

The Constitution of the Republic of South Africa is the supreme law of the Republic of South Africa. It provides the legal foundation for the existence of the Republic; it sets out the rights and duties of its citizens and defines the structure of the Government. According to section 27(1)(b) of the Constitution of the Republic of South Africa, (1996) “everyone has the right to have access to 'sufficient' water”. Every water services institution must take steps to realise these rights. This means that every municipality must plan in its water services development plan to realise these rights. Section 155 of the Constitution talks about the establishment of local government and how they are required to provide municipal services equitably and sustainably. In conjunction, Section 152 of the Constitution talks about the objects of local government where municipalities are required to ensure the provision of services to communities in a sustainable manner and promote safe and healthy environment. This includes the provision and delivery of water to communities and as a basic need, water is directly linked to health and sanitation. As it continues, section 152(2) mandates local government to strive within its financial and administrative capacity to achieve all objects of local government. This means that a municipality must do all it can to ensure proper management of its finances and administrative rights for an improved water service delivery process for all of its areas of jurisdiction. Moreover, section 153(a) requires local government to structure its administration,

budgeting and planning processes and give priority to the basic needs of the community. This means that municipalities must put water service delivery and management as a priority because water is a basic need that people cannot live without. Conclusively, Part B, Schedule 4 of the constitution complements all these sections with local government matters and states that water and sanitation services limited to potable water supply systems are of concern as specified in Section 155(6)(a) and (7).

3.3.2 National Development Plan (NDP) 2030

The National Development Plan is a “plan for the country to eliminate poverty and reduce inequality by 2030 through uniting South Africans, unleashing the energies of its citizens, growing an inclusive economy, building capabilities, enhancing the capability of the state and leaders working together to solve complex” (National Planning Commission, 2030). The NDP addresses the need for sustainable service delivery including the delivery of water services. It brings about strategies that will improve sustainable service delivery and achieve its vision by 2030.

According to the Development Plan Vision 2030, access to basic services especially water, is a daily challenge due to challenges such as lack of adequate infrastructure among others. Even where infrastructure is available, households can often not afford to pay for water services. Therefore, some form of subsidy must be available to ensure that people can access basic services. This can be provided as a grant to the household or to the municipality to provide free services that meet people's basic needs. Furthermore, South Africa needs to invest in a strong network of economic infrastructure designed to support the country's medium- and long-term economic and social objectives. This economic infrastructure is a precondition for providing basic services such as electricity, water, sanitation, telecommunications and public transport, and it needs to be robust and extensive enough to meet industrial, commercial and household needs.

3.3.3 White Paper on Local Government (1998)

The White Paper on Local Government provides for local government transformation to attain the Constitution's intended ends. It aims to enhance the value of citizen's lives and satisfy their social, economic and material needs sustainably. It also aims to fix the damage caused by apartheid by promoting service delivery that meet the quality of life and needs of both urban

and rural communities (White Paper on Local Government, 1998). In respect to sustainable service delivery, water service delivery is a mandate to local government as regulated in the White Paper on Local Government (1998).

3.3.4 National Water Services Act 108 Of 1997

The Water Services Act 108 of 1997 states that everyone has a right of access to basic water supply and basic sanitation. Furthermore, every water services institution must take reasonable measures to realise these rights. Section 4(3)(c) of the Water Services Act. 108 of 1997 states that “a water service authority may not deny a person access to basic water services for non-payment, where that person proves, to the satisfaction of the relevant water services authority, that he or she is unable to pay for basic services”. Therefore, it is the responsibility of local and or district municipalities as Water Service Providers or Water Service Authorities to provide water services to all communities within their area of jurisdiction.

The water services act aims to provide for the rights of access to basic water supply and basic sanitation creating the setting of national standards and of norms and standards for tariffs. The permeable of the act also describes the standards for tariffs, water service development plans and providing a regulatory framework for water services institution and water services intermediaries to provide for the establishment and disestablishment of water boards and water services committees and their powers and duties. It also provides for the monitoring of water services and intervention by the minister or by the relevant province and provide for financial assistance to water services institutions. It further provides for certain general powers of the minister to provide for the gathering of information in a national information system and the distribution of that information to repeal certain laws and to provide for matters connected therewith (Republic of South Africa, 1997).

3.3.5 Free Basic Water Policy

When implementing the free basic water policy, the Department of Water and Forestry pointed out that even though the national government has strongly promoted a free basic services initiative with an aim to alleviate poverty, it is still the local government that has been constitutionally mandated to deliver water services (Department of Water Affairs and Forestry, 2007). This meant that a free basic water policy must be implemented at the local level where decision making presides. However, it is still the duty of national and provincial government's

obligation to provide support to local government. Additionally, the provincial government is required to monitor the performance of local authorities. Muller (2008) pointed out that despite the controversy raised by the South African government's policy decision in 2001 to provide a basic amount of water for free, its experience within the context of the country has demonstrated that addressing social and environmental dimensions together with economic dimensions can lead to more effective and sustainable policy implementation. This view was also supported by Matha (2017) who studied and investigated the implementation of the free basic water service policy in Ingquza Hill Local Municipality. The study obtained perceptions from the Department of Infrastructure and Engineering services in Ingquza Hill Local Municipality ward councilors and executive committee members and identified challenges in policy implementation that the municipality experienced. It also highlighted that the free basic water service policy is part of the service delivery provision and municipalities are mandated to provide for such services to the people.

3.3.6 Spatial Planning and Land Use Management Act (SPLUMA) 16 of 2013

The Spatial Planning and Land Use Management Act 16 of 2013 (SPLUMA) was established to provide a uniform system of spatial planning and land use management throughout South Africa for municipalities to apply land use control. It also governs informal and traditional land use processes. The establishment of SPLUMA was necessary to remedy South Africa's planning laws, which were left fragmented and inconsistent as a result of the repeal of apartheid era laws. It places emphasis on the fundamental role municipal planning and municipalities have on effective spatial planning and development (Abraham and Gross Attorneys, 2020). SPLUMA basically reinforces the vision set out by the NDP (National Development Plan) to deal with the serious socio-economic issues crippling South Africa through spatial transformation (The Association for Water and Rural Development, 2017). Every local municipality is required to develop their own by-laws in terms of SPLUMA and ensure that they are compliant. The framework guides the distribution of sustainable services through proper spatial planning and land use management in all municipal boundaries.

Section 20 of SPLUMA mandates municipalities to develop spatial development framework that will interpret and represent the spatial development vision of the municipality to guide planning and development decision across all sectors of government. This also includes the previously disadvantaged areas under traditional leadership, rural areas, and informal settlements. Sustainable water service delivery is within the future visions of Nkomazi local

municipality SDF hence all the planned spatial developments will need provision of basic services such as water in a timely and sustainably planned manner. The Municipal SDF must be prepared as part of a Municipality's IDP in accordance with the provisions of the Municipal Systems ACT. The municipality's IDP clearly sets out a developmental vision and all projects planned for the next five years and how they are going to be implemented. This includes projects aimed at providing and prioritising basic needs such as water service delivery. As an IDP is reviewed annually, this means that any changes or requirements necessary for the municipality to provide or improve their water service delivery can be incorporated into the annual review of IDP to ensure undisturbed water service delivery process.

SPLUMA also mandates municipalities to develop land use scheme that should give effect to municipal SDF and IDP. This means that SPLUMA is an agglomeration of all municipal statutory planning documents and clearly entails how the municipality intends to plan out and carry out its objects of local government as set out in section 152 of the constitution. As a result, Nkomazi local municipality is mandated to provide water services to its area of jurisdiction in line with SPLUMA and must transparently do so through different strategic plans for the future that this chapter will review as we go forward.

3.3.7 Local Government Municipal Systems Act 32 of 2000

The Municipal Systems Act was established to provide for the core principles, mechanisms and processes necessary to enable local government to move progressively towards the social and economic upliftment of local communities (Local Government: Municipal Systems Act 32, 2000). It mandates local government to ensure universal access to essential services including water delivery, that are affordable to all and defines the legal nature of municipalities as including the local community within its area and working in partnership with the municipality's political and administrative structures. The act also establishes a simple and enabling framework for the core processes of planning, performance management, resource mobilisation and organisational change which underpins the notion of developmental local government. It empowers the poor and ensures that the municipalities put in place service tariffs and credit control policies that take their needs into account by providing a framework for the provision of services, service delivery agreements and municipal service districts. The municipal system act also establishes a framework for support, monitoring and standard setting by other spheres of government to progressively build local government into an efficient, frontline development agency that is able to integrate the activities of all spheres of government

for the overall social and economic upliftment of communities in harmony with their natural and local environment.

3.3.8 Municipal Finance Management Act 56 of 2003

The Municipal Finance Management Act intends to secure sound and sustainable management of the financial affairs of municipalities and other institutions within the local spheres of government and establish treasury norms and standards for the local government (Municipal Finance Management Act, 2003).

3.3.9 Strategic Framework for Water Services

The strategic framework for water services was approved by Cabinet on 17 September 2003 and it sets out a comprehensive approach with respect to the provision of water services in South Africa. It ranges from small community water supply and sanitation schemes in remote rural areas to large regional schemes supplying water and wastewater services to people and industries in the largest urban areas. It vividly outlines the changes of approach needed to achieve policy goals as a result of the progress made in establishing democratic local government and developments in the sector since 1994. Some of the main components of the framework are as follows:

3.3.9.1 The Water Ladder

This means that the National government is committed to eliminating the backlog in basic water services and to progressively improving levels of service over time according to the original aims of the Reconstruction and Development Programme set out in 1994 (Strategic Framework for Water Services, 2003). The first step of the water ladder is the provision of at least a basic water and sanitation service to all people living in South Africa. It is the most important policy priority, and the government has to commit adequate funds to make this a possibility within the set number of years. The next step involves an intermediate level of service such as a tap in the yard. Water services authorities must assist communities to achieve intermediate and higher levels of service wherever practical, affordable and sustainable without compromising the national policy priority of universal access to at least a basic level of service. The national government will then increase its commitment and grant funds over time to support households to step up the services ladder. This will also require basic levels of service to be reviewed in future and consider increasing the basic level from 25 to 50 litres per person.

3.3.9.2 Sustainability

The Strategic Framework for Water Services (2003) states that access to a tap and toilet is not of much use if the water is not flowing or the toilet is no longer working. Sustainability requires services that are affordable. Due to this, a ground-breaking policy of free basic water and sanitation services has been introduced. This means that everyone in South Africa has the right to a basic amount of water and an affordable basic sanitation service. This right comes with a responsibility not to abuse the right to free basic services and to pay for services where they are provided over and above a basic service requirement.

3.3.9.3 Institutional reform: Water boards and the private sector

In many places of South Africa, the capacity to offer services effectively and efficiently is a key restriction. The government will take the lead in pushing institutional reform to maximize capacity utilization and build efficient and sustainable water service providers. Where applicable, this institutional reform process will encourage regional integration of water services. As part of this procedure, water boards will be transformed. The private sector's role in providing water services is welcomed.

3.3.9.4 Targets

This includes the targets set out which are aspirational. The targets for access to water supply and sanitation services has exceeded those set out in the Millennium Development Goals. Meeting them will require a concerted and collaborative strategy on the part of all role-players.

3.3.10 Batho Pele Principles

The Batho Pele principle was conceived with the aim of transforming service delivery in the public sector as it is believed that good service delivery leads to happy customers and employee satisfaction for a job that has been successfully done (Department of Social Development, 2022). Batho Pele is also a national government white paper, and it is all about giving good customer service to the users of the government services. All public servants are required to practice Batho Pele with 8 principles or guidelines in the White Paper in the following manner:

- Consultation
- Service Standards

- Courtesy
- Access
- Information
- Openness and Transparency
- Dealing with complaints
- Giving Best Value

This principle was founded on 8 principles but there has been an addition of two more principles since the inception of the awards namely: Redress and Customer impact.

3.4 Local Policies and Legislation on Household Water Service Delivery

The following local policies and legislations related to household water service delivery in rural areas are included in this section:

3.4.1 Municipal Integrated Development Planning (IDP)

Integrated Development Planning is an approach to planning that involves the entire municipality and its citizens in finding the best solutions to achieve good long-term development. The Local Government Municipal Systems Act 32 (2000) requires that municipalities draw up an Integrated Development Plan (IDP) that will guide the municipality to achieve its developmental nature. The development-oriented planning that is referred to above, is the integrated development planning, which is a process through which the municipalities prepare strategic development plans that extend for a five-year period. The ultimate product of this planning process is the Integrated Development Plan. An Integrated Development Plan (IDP) is the principal strategic planning instrument that guides and informs all planning, budgeting, management and decision-making processes in a Municipality.

According to Section 153 (a) of the Constitution of the Republic of South Africa, municipalities must structure and manage their administration, budgeting and planning processes in such a way that priority is given to the basic needs of the community and to promote the social and economic development of the community. The Constitution provided local governments with a clear mandate to transform and move away from only providing services and implementation of regulations as was done previously to focusing on planning and development as a way of improving the socioeconomic status of previously disadvantaged communities. The Constitution further explicitly states that municipalities are accountable, have to be transparent

and responsive in delivering essential services to communities. Local municipalities should always make decisions regarding the priority needs of the communities in a participatory and consultative manner. This will not only create and increase the efficiency of governance but also has the potential to curb any unforeseen unrest as everyone is included in decision making. Therefore, an IDP promotes water service delivery as it “provides a powerful instrument for municipalities to facilitate integrated and coordinated service delivery within their locality” (Ndevu & Muller, 2018). The IDP may incorporate a Water Service Development Plan as well as projects that aim to provide water service delivery.

3.4.2 Community participation in the IDP process

Community participation is believed to be the cornerstone during the process of IDP generation. Therefore, it is argued that a perception exists that consultation is well performed in the municipal context (Dlamini & Reddy, 2018). After all, there are public participation programmes such as IDP Representative Forum Meetings, Community IDP Hearings, Imbizos, Ward Committees and various other community-based fora that give local communities a platform to engage authorities. Valeta and Walton (2008) argue that there are notable discrepancies between the practical aspects and the documented requisites for IDPs regarding community participation. They further highlight that the purported public consultation process is often followed for the sake of compliance rather than for its intended purpose. This means that the views shared during IDP processes are still subject to scrutiny by authorities who are believed to alter public submissions. For example, the law requires that the community be involved in the setting of indicators and targets to measure the implementation of a Municipality’s Integrated Development Plan. However, logic dictates that most of the communities especially in rural areas do not understand what constitutes an indicator and how to formulate one. Instead, authorities will develop their own indicators and approach the community to rubber stamp them. Supposedly, these indicators if well-crafted will be used against the authorities for accountability and such an opportunity remains in hanging. This poses a negative impact of the delivery of important services such as water.

The flawed nature of such activities is showcased in many instances wherein municipal managers’ report that they consulted the public yet, all the development and crafting of the IDP is done in the office without the inputs of the end users (local communities). The failure of the authorities to engage the local communities is reflected in the multiple service delivery civil

unrests in South Africa. Fourie (2018) argued that authorities operate in limited budgets and timeframes which negatively impact on their public consultation intentions.

3.4.3 The IDP and Budgeting Process

The Municipal Systems Management Act Pillay (2018) avers that every municipal council must, for each financial year ending 30 June, appropriate money with its budget. Budgeting is a process of allocating expenditure between capital and operational costs and also determining the future anticipated incomes. One of the major issues that should be included in these budgets is capital expenditure and operational costs to cover water infrastructure development and as well as daily maintenance of water supply systems. Most of the municipalities rely on ageing water infrastructure which constantly requires maintenance. Moreover, the infrastructure cannot be expanded to new settlements and even remote rural areas.

The allocation of resources to implement the IDP (and by reference the vision of a municipality) occurs through the budgeting process and it is mandatory for all local municipalities. With the pressing demand for a variety of goods and serviced which are mandated to the local municipalities, it is equally important to interrogate the prioritisation of expenses so that the local communities are served with dignity. Most local municipalities use the existing systems to supply water including water tankers which are dispatched to rural communities which lack access to a clean water supply. Therefore, the budgeting process should be carried out diligently to promote sustainable use of resources.

The budget must be informed by the strategies contained in the IDP (and not vice versa); but the IDP must in turn be informed by the availability of resources. A municipality is required to review its IDP annually. Reviews allow the municipality to expand upon or refine plans and strategies, to include additional issues and to ensure that these plans and strategies inform institutional and financial planning (Velta & Walton, 2008). For example, many municipalities have failed to turnaround the water challenges because of inadequate review of the budgets. The review and amendment of the IDP thus, further develops the IDP and ensures that it remains the principal management tool and strategic instrument for the Municipality.

In terms of scheduling, the review of the IDP normally starts in August of each year and ends with the adoption of the reviewed IDP at the end of May of each year as provided for in the legislative guidelines (IDP guidelines, 2014). The Budgeting process also runs parallel with

the process of reviewing the IDP, and when the two products are (IDP and Budget) are normally adopted at the same time (before or end of May) (Fourie & Opperman, 2007). It can be argued that the budget is the most important mechanism in giving effect to a municipality's service strategies such as water supply.

3.4.4 Sustainability of an IDP

Sustainability of an IDP within the municipal context entails ensuring that the costs, resources, and impact of policy can be borne within the local government environment (Dlamini & Reddy, 2018). The impact of policy on the community, infrastructure and the natural environment is often underestimated. This is mainly attributed to the lack of foresight during the planning process. In most instances the long-term impact of failing to budget for simple water technology might be overlooked because the current systems seem to be working well in the short term, but when a major breakdown occurs, the problem escalates beyond the capacity of the local municipality, and this will require another period of budgeting while the community suffers. To achieve sustainability, the local municipality should employ appropriate budgeting tools so that both financial resources and water requirements are met, and they do not conflict and compete but are viewed as complementary. This aspect is yet to permeate many municipalities because of lack experience and most municipal employees are politically appointed without the requisite knowledge of their job.

3.4.5 Nkomazi Local Municipality IDP

Through its IDP, Nkomazi local municipality has developed a long-term development framework to map the strategic vision of the municipality over the next 20 years and also mapped the strategic priorities for the next 5 years in line with the newly adopted IDP. The output, outcomes, and deliverables of the municipality over the next three years includes the top 10 priorities for the years 2022-2027. Water and Sanitation is a top priority within the municipality followed by roads and stormwater amongst other priorities that the municipality has developed in its IDP. As one of its key performance areas, the municipality has listed water conservation and demand for its strategic objective with water demand management as one of the priority programs. Through this strategic planning, the municipality has a goal to improve access to service by building a sustainable infrastructure in order to ensure proper operation and maintenance. This goal targets households without access to basic services such as water and sanitation.

Nkomazi Local Municipality, through its IDP 2022-2027 also developed a Water Services Development Plan as the authorised water service authority within its area of jurisdiction. The water service development plan also adheres to the Water Services Act 108 of 1997, and the Municipal Systems Act 32 of 2000. This means that the municipality has a duty to all consumers or potential consumers within its area of jurisdiction to progressively ensure efficient, affordable, economical and sustainable access to water services. The IDP also includes the integrated water resources management plan to facilitate the implementation of water resource management by the Nkomazi Local Municipality and establish an appropriate balance between the need to protect and sustain water resources and the need to develop and use them sustainably. The Nkomazi Local Municipality IDP 2022-2027 also outlines adequate water supply as one of the key development challenges within the municipality and intends to resolve this through demand side management which is a critical part of the approach to ensuring a more sustainable use of water as a resource. The water catchment management and efficient nature conservation programmes within the IDP will help to ensure an adequate supply of clean water in the municipality.

3.4.6 Spatial Development Framework (SDF)

An SDF is a framework that “seeks to guide the overall spatial distribution of current and desirable land uses within a municipality in order to give effect to the vision, goals and objectives of the municipal IDP” (Afesis Corplan, 2013). A Spatial Development Framework aims to promote sustainable functional and integrated human settlements, maximise resource efficiency, and enhance regional identity and unique character of a place.

3.4.7 NKOMAZI LOCAL MUNICIPALITY SDF

The Municipal Systems Act (2000) put the responsibility of the provision of basic services to the communities and through its SDF, Nkomazi Local Municipality used the following guidelines. The SDF is developed in various phases as mandated by SPLUMA section 12 and in Nkomazi local municipality’s case the following phases have been involved. The first phase in preparing its SDF is to incorporate compliance policy and legislative context, then to be followed by analysis of spatial challenges and opportunities identified within the municipality. For the third phase, the NLM intends to develop spatial proposals to be implemented on the final phase of the SDF. So, where prioritisation of service delivery such as water services is

involved, the NLM intends to address this in short term strategic plans that are well incorporated into the medium- and long-term plans as well.

Nkomazi Local Municipality By-Law in section 4 reveals that the municipality must draft, adopt and review a Municipal Spatial Development framework and regard the applicable provisions as set out in chapter 4 of the act. The By-Law also applies with the necessary changes to review or amend SDF to have the legal effect and provide for matters contemplated in section 21 of the By-Law. This means that the municipality may determine any further plans and policies and instruments under which the municipal SDF must be applied, interpreted and implemented. The By-Law also mandates the municipality to facilitate the integration of other sector plans into the municipal SDF and this also includes plans targeted at the improvement or management of water service delivery within the municipality. This will require a project committee that consists of various members including the IDP office, planning department and engineering department where water service provision and delivery are managed and maintained.

3.4.8 Land Use Management Scheme

Land use management schemes are commonly used to make certain decisions about the use of land and other resources that take place on the land. A study carried out in Mexico indicates that land use management schemes have been very helpful in the management of water resources (University of New Mexico, 2016). They further argue that the Land use decisions that direct the type and location of development that occurs are often made by local governing bodies, whereas most water management decisions are made at the State level. The Organisation for Economic Co-operation and Development (OECD; 2017) report indicates that Italy has a three-tier hierarchical planning system which also covers land use programs. At the regional level, The Regional Landscape Plan provides strategies to preserve and enhance the landscape that may include restrictions on the type and scope of development allowed in areas of natural, cultural or historic value. Such documents can either be issued separately, or as part of Regional Territorial Plans which identifies general policy priorities and objectives at the regional level.

Garg et al. (2020) reiterate that land use planning is crucial for the management of water sources as evidenced in India. It was noted that the changes in land use patterns in India have impacted on the water supply due to the depletion of groundwater. Wegner, et al. (2013) argue

that in regions where water availability is limited, land use changes could result in an increase of water scarcity and thus contribute to a deterioration of living conditions. Indeed, the local authorities should develop measures to ensure that land use patterns do not affect the availability of water especially in rural areas.

3.4.8.1 Nkomazi Local Municipality Land Use Scheme 2018

Nkomazi Local Municipality has, in terms of Section 24(1) of the Spatial Planning and Land Use Management Act, 16 of 2013, adopted and approved a land use management scheme. The scheme involved in an incremental approach to include all areas within the jurisdiction of Nkomazi Local municipality including traditional authorities. It is through the land use scheme that the municipality entails laws, regulations, and policies governing the administration and management of the land to ensure an effective and sustainable service delivery. So, the duties of the Nkomazi Local Municipality Land Use Management scheme can be inferred similarly. This is because land use schemes mainly highlight the land use activities for the municipality and do not break it down to the related services. For example, changes in land use scheme from residential to business, say for accommodation purposes, will require more water to cater for the tenants compared to the originally planned one dwelling per erf for residential land uses. So it is in this manner that Nkomazi Local Municipality land use scheme affects the delivery of water services to its community.

3.4.9 Spatial Planning and Land Use Management By-Laws

By Laws are enacted to give the Municipality administrative rights as mandated by the Constitution of Republic of South Africa (Act 106 of 1996) and introduce, adopt and consolidate processes and procedures to implement an effective system of Land Development, Land Use applications and Spatial Planning Land Use Scheme within the Jurisdiction of Nkomazi Local Municipality (Nkomazi Local Municipality By-Law, 2015). In terms of Section 156(1)(a) and (b) of the Constitution, Municipalities are given the executive authority and the right to administer local government matters and other matters assigned to municipalities by the Provincial or the National legislations. Therefore, municipal planning is listed as a local government matter while Section 156(2) of the constitution empowers municipalities to make and administer by-laws for the effective administration of local government matters as enacted in part B of Schedule 4 of the constitution. As a result, the commencement of the Spatial Planning and Land Use Management Act, 16 of 2013 has

necessitated the promulgation of by-law to ensure that the municipality can give effect to its obligations.

3.4.9.1 Nkomazi Local Municipality Spatial Planning and Land Use Management By-Laws

Nkomazi Local Municipality Spatial Planning and Land Use Management By-law incorporates all statutory planning tools and documents in one place and reviews them for a better service delivery. Section 4 of the by law focuses on the Municipal SDF while Section 15 focuses on the Land Use Scheme. Section 115 of the By-Law mandates the Nkomazi Local Municipality to provide engineering services to every land development area for the appropriate of the land. This includes the delivery of water to such areas and may determine standards for other engineering services including water, water drainage, sanitation services and other water related services.

Nkomazi Local Municipality has managed to develop several by-laws tailored for the municipality's specific obligations in terms of prioritisation of the public's needs. Along with the general by-laws, this includes Waste Management by-law, Traffic by-law, Tariff by-law, Street Trading by-law, Sand Harvesting by-law, and Property Rates by-law (Nkomazi Local Municipality, 2022). With each by-law representing a specific area of prioritisation and now that water service delivery is in the mix, there is a need to implement measures towards developing by-laws specifically tailored for water service delivery within the municipality's jurisdiction. In terms of the Municipal System Act 32 of 2000, a municipality council may legislate employing by-laws to exercise the executive authority within its area of jurisdiction to promote and undertake development and provide municipal services such as a water service delivery system

3.5 Overview of Household Water Service Delivery Challenges

Makhari (2016) has pointed out that access to water and water scarcity are the most critical impediments to sustainable development in municipal household water service provision. Access to good water and sanitation services are essential for health, economic development, and environmental protection. Realising the importance of access to a safe and adequate water supply has become the core business of many cities all over the world. This study will look at overview of household water service delivery in the following manner:

3.5.1 Global Overview of Household Water Service Delivery Challenges

According to the World Bank (2022) Water scarcity has affected more than 40% of the global population with water-related disasters accounting for 70% of all challenges related to household water delivery. The World Bank has helped countries ensure the sustainability of water use, building climate resilience and strengthening integrated management (World Bank, 2022). Recently, most countries are putting unprecedented pressure on water resources as the global population is growing fast, and estimates have shown that with modern practices, the world will be faced with a 40% shortfall between forecast demand and available supply of water by 2030 (Biswas & Tortajada, 2019), (Heyne, 2021). Additionally, chronic water scarcity, hydrological uncertainty, and extreme weather events (especially floods and droughts) are perceived as some of the biggest threats to global prosperity and stability. Water as a resource is already scarce in many parts of the world while estimates have indicated that over 40% of the world population lives in water scarce areas (Greve, 2018). The fragmentation of water as a resource also constrains water security whilst There are 276 transboundary basins, being shared by 148 countries, accounting for 60% of the global freshwater flow. Likewise, 300 aquifer systems are naturally transboundary, with 2.5 billion people worldwide depending on groundwater. This means that cooperation is needed to achieve optimal water resources management and delivery solutions for all. Dealing with these complex and interlinked water challenges, will require countries to improve the way they manage their water resources and associated services.

Globally, there has been two great challenges to be faced in providing household water and sanitation services to people especially in developing countries. The first challenge focuses on completing the “old agenda” of providing water access at a household level (Briscoe). A billion people still do not have access to an adequate supply of water, while 2 billion do not have adequate sanitation facilities. What is required is to change the focus from supply-driven approaches and subsidized programs to ones in which users are provided the services they want and are willing to pay for. The private sector has a huge responsibility to play for reasons of both service quality and financing. The second challenge will be to address the “new agenda” to manage water in an environmentally sustainable manner. This is a challenge that even the industrialized countries have yet to meet successfully, and it poses an even more daunting one for developing countries, as resources are much more limited and starting conditions are far worse (McDonald, 2018). Emerging experiences from industrialized and developing countries

as well shows that the approach must include participation by all stakeholders in basin management, close attention to costs in setting standards and prioritizing investments, and substantial use of economic instruments like water markets, and abstraction and pollution charges.

3.5.2 South African overview of household water service delivery challenges

Most of South African households enjoy access to tap water, but some of them are still forced to fetch their water from rivers, streams, dams, wells and springs (Toxopeus, 2019). National government has stipulated the minimum quantity of potable water to be 25 litres per person per day equivalent to 6 000 kilolitres per household per month. But over a third of consumers benefit from their municipality's free basic water services. Despite the improvements in providing access to water and sanitation facilities in South Africa, there has been a steady decrease in the number of households that are satisfied with the water services they are receiving. This has been illustrated by the number of service delivery protests where approximately 144 protests in the first six months of 2018 took place. Households were increasingly dissatisfied with the quality, quantity, access and number of interruptions in water delivery.

When looking at the challenges facing local government regarding basic service delivery in South Africa, issues such as institutional capacity, maintenance of existing infrastructure, mismanagement of funds, high levels of corruption and a lack of public anticipation remain dominant (Makhari C. L., 2015). There has been public outcry in South Africa regarding the poor performance of municipalities when it comes to service delivery. Additionally, a good proportion of service delivery protests are related to municipalities' failure to carry out basic maintenance of existing infrastructure. Makhari (2015) studied and assessed water service delivery performance within the Municipalities of the City of Tshwane (CoT), City of Cape Town (CoCT) and EThekweni Metropolitan and compared water service delivery for the Water Service Authorities in each municipality.

The indicators of interest were the changes in performance levels regarding the provision of water services for different segments. In line with the study findings for Financial Performance Indicator (KPI 9) water supply in the water service authorities was undertaken by local government that have the dual objectives of providing a social service while generating revenue to offset cost. Ironically, most of the water service authorities did not recover their operating

expenses from their own revenues and remain dependent on state government for subsidies. A study by Makhari (2015) concluded that the CoT is the best performer on the Financial Performance (KPI 9). The KPI requiring attention is Financial Performance (KPI 9) for the CoCT and EThekweni water service authorities with indicators showing a need for improvement. Compliance was encouraged for all water service authorities on the Financial Performance Indicator (KPI 9) to ensure that their water business is sustainable. The study also recommended that the relevant stakeholders and project proponents consider financial viability (sustainability) through the increase in value for money expenditure to grow and diversify their revenue.

3.5.3 Overview of Household Water Service Delivery Challenges in Mpumalanga Province

The Mpumalanga provincial government has published all matters on the condition and challenges that the province faces regarding household water service delivery. The issues identified included an acute deficit in terms of water resources, where sources such as the dams have already dried in areas such as in Dr. JS Moroka Local Municipality (Mpumalanga Provincial Government, 2022). Water security was also identified as a challenge in eMalahleni Local Municipality. This is because the water demand which currently sits at 161,92ML/Day was higher than the available supply at 122.49ML/Day so this makes the current deficit to be estimated at approximately 39,43 ML/ day. High distribution water losses have occurred because of aged infrastructure made up of 60% asbestos pipes was another challenge that has been affecting water service delivery. So aged infrastructure, especially pipes that were laid between 1920 and 1940 can no longer cope with the demand especially in the fast-growing townships. Vandalism of the existing infrastructure and drilling of pipes creating illegal connections resulting in more water distribution losses since this is the work usually performed by unskilled persons. A deficiency in the skills for operations and maintenance of existing infrastructure regarding asset care management has been another concern with the escalation of water debts owed by municipalities to the amount of R2.3 billion in total.

Water Service Authority function is with local municipalities all over the province and some are failing in disposing the function. Lack of water and sanitation master plans and aged infrastructure resulting in collapsing infrastructure system has proved to be a difficult challenge for the province. The inability of Govan Mbeki and Victor Khanye municipalities to fully service their Rand Water debts had resulted in Rand Water reducing water pressure and this

has affected water supply (Mpumalanga Provincial Government, 2022). Lack of safe and reliable water supply (according to the Blue and Green Drop reports & scores of Municipalities), the lack of technical capacity within municipalities evidenced by poor infrastructure planning and implementation of infrastructure projects. Inadequate budget allocation for the implementation of projects and delays adds yet to the existing water delivery challenges that the province has experienced.

3.6 Causes of Household Water Service Delivery Challenges

This section provides the causes of water service delivery challenges as follows:

3.6.1 Municipal consumer debt and poor financial management

The Former Finance Minister Nhlanhla Nene had demonstrated the crippling financial state of municipalities back in 2018 when he revealed that 112 municipalities had insufficient funds to meet their expenditure needs for the financial year and only 14 municipalities had approved financial recovery plans. This is because a large contributing factor to the dire state of municipal finance is consumer debt. Even though more households have access to piped water, there has been a steady decline in the number of households that pay for their piped water delivery services (Enqvist & Ziervogel, Water governance and justice in Cape Town: An overview, 2019). Non-payment of water delivery services by has amounted to R143.2 billion as of 30 June 2018, households have accounted for the bulk of consumer debt owing to municipalities (71.2% of total debt), while government accounts for 5.5%. Of this debt, only R27.2 billion was debt accrued within the last 90 days of the report, which National Treasury notes as realistically collectable (Makhari, 2015). This has significantly influenced the ability of local government to fulfil its functions and address the governance challenges that municipalities face. Additionally, municipalities are unable to pay their creditors, like water boards, for the provision of water services. Currently, municipalities owe R13.1 billion to water boards and the Department for Water Services, Makhari (2015) concluded.

3.6.2 Governance and accountability

The poor financial audits against municipalities across the country have shown serious governance and accountability issues within local government (McDonough, Miranti, & Schoderbek, 2020). In August 2013, the Auditor-General lamented the lack of accountability in municipalities and urged local government to address it by ensuring action is taken against

guilty parties. Of particular concern were the weaknesses identified in internal control structures. The Auditor-General also provided recommendations to rectify the problem, but five years later the same governance challenges persisted. The Auditor-General's call for accountability remained largely unheeded and even after the 2016 local government elections this was still the case (Makhari C. L., 2015). Little meaningful action is taken against officials for non-compliance with procedures, fraudulent activity or improper conduct reported by the Auditor-General.

3.6.3 Human resources

Municipalities generally lack the technical knowledge, skill and expertise required to perform core operational and financial functions (Mazantsana, Werner, & Chinyamurindi, 2021). This deficit included planning, engineering and project management and has proved to be a major constraint to effective service delivery. Additionally, municipalities are unable to fill vacant posts. Of the 317 756 funded municipal posts that were available in 2017, 45 219 of those posts remained unoccupied, translating to a national vacancy rate in local government of 14.2% (Munzhedzi, 2021). Posts are particularly difficult to fill in rural areas while the Auditor-General, in his municipal audit opinion, singled out vacancies and instability in key positions within municipalities amongst the reasons for the accountability failures in municipalities. In addition, inadequate skills have led to a lack of oversight by municipal councils.

3.6.4 Lack of planning

The Municipal Systems Act compels all municipalities to adopt a single, inclusive and strategic plan for the development of the municipality which, must align the municipality's resources and capacity with the implementation of the plan (Molale, 2019). The IDP process also includes that each municipality (defined as a water services authority) must develop a water services development plan (WSDP), which will map out the municipality's plan for providing water services to all its consumers. As crucial as these plans are, IDPs and WSDPs are often outdated or not properly implemented. The Auditor-General noted that almost half of the municipalities defined as water services authorities did not have a maintenance plan for their water infrastructure (Makhari C. L., 2015). Many municipalities also failed to conduct basic conditional assessments of their infrastructure to inform their plans and budgets. The municipal trend of failing to plan adequately has left most municipalities vulnerable to crisis management

while maintenance, for example, is in most of the cases no longer performed as a preventive measure but as a reactive measure instead.

3.6.5 Infrastructure

Municipalities have the task of developing and maintaining infrastructure to ensure that household water services are delivered sustainably. But some municipalities are facing a serious backlog in their infrastructure maintenance and rehabilitation needed to provide potable water and sanitation services, due to severe financial and capacity constraints (Makhari, 2016). The Auditor-General reported that while funding and support from the national government is generally available for municipal infrastructure, municipalities underspend on their allocations and fail to deliver on projects because of poor financial, performance and project management. Inadequate monitoring and oversight of contractors, planning and poor quality of workmanship leads to unnecessary project delays and leads to targets remaining unmet or seriously delayed (Auditor General Special Report, 2021).

3.7 Institutional framework of water service provision

The Constitution gives everyone the right to access sufficient water while the Water Services Act 108 of 1997 (WSA) sets the legislative framework to effect to this right by regulating institutions that manage the access and delivery of household water services (Toxepeus, 2019). The Act also acknowledges that cooperative governance is vital in any efforts to provide water supply hence, national and provincial government also form part of the overall institutional structure of the water services landscape. The institutional framework of household water service provision that will guide this study is as follows:

3.7.1 National and Provincial Government

It is local government's responsibility to ensure that every person has access to water services, but national and provincial government have an important monitoring and oversight role to play as they also have to ensure that municipalities execute their water services functions effectively. In its preamble, the Water Services act (WSA) recognises the duty of all spheres of government as the one-off ensuring that water supply and sanitation services are provided efficiently, equitably and sustainably and to strive to provide these services for subsistence and sustainable economic activity.

3.7.2 Municipalities

Following their constitutional duties, every municipality as defined by the WSA is obliged to progressively ensure efficient, affordable, economical and sustainable access to water supply and sanitation services (Toxopeus, 2019). Not every municipality is identified as a water services authority for purposes of WSA. Which explains why out of South Africa's 278 municipalities, only 169 are water services authorities. Given the different type, size and capacity of municipalities across the country, how they ensure that these services are delivered always vary. Municipalities may provide these water services, contract these services out to water services providers or enter into a joint venture with another water services institution to provide the services. If a municipality performs the functions of a water services provider itself, it must manage and account separately for such functions. It may also provide such services outside its area of jurisdiction if contracted to do so by another municipality. While, on the other hand, if a municipality contracts these services out to other providers, it must monitor their performance and ensure compliance.

3.7.3 Water Services Providers

In cases such as this a municipality may contract with a public or private water services provider to supply water and sanitation services. The regulatory framework provides for a range of institutional arrangements to ensure the provision of water services, each with its own set of benefits and restrictions (Toxopeus, 2019). Arrangements may include providers in the form of the municipality itself, another municipality, a municipal utility, a multi-jurisdictional utility, a water board, a community-based organisation, a private company, and a venture owned jointly by a municipality and the national government.

3.7.4 Water Services Intermediaries

A water services intermediary is any person or organisation who is obliged to provide water services to another in terms of a contract where the obligation to provide water services is incidental to the main object of the contract (Toxopeus, 2019). If the main purpose of the contract is to provide water services, the person is classified as a water services provider, not an intermediary. This becomes clear when, farmers who are responsible for providing housing and related services to their employees living on the premises are considered intermediaries when they are contractually obliged to provide basic water services to their employees. This is

also true for mining companies that provide water to their employees living in mining hostels and houses.

3.7.5 Water Boards

Water boards are organs of state established by the Minister, and provide, as their primary activity, bulk water services to other water services institutions within a specific area (Toxepeus, 2019). While it may carry out other activities, a water board has to ensure that these secondary activities do not interfere with its primary function of providing water services. All of its activities must be laid out in a contractual agreement. When a water services institution requests the services of a water board, it may not refuse the request unless it would not be viable, for technical and financial reasons, to provide the water services.

South Africa currently has nine water boards, with Rand Water in Gauteng, Umgeni Water in KwaZulu Natal and Overberg Water in the Western Cape being the largest three water boards in the country.

3.7.6 Water Services Committees

The WSA gives powers to the Minister to establish water services committees to provide water supply and sanitation services to consumers within a specific area. The Minister must consult with the population of the proposed service area, the municipality, the Minister for Provincial Affairs and Constitutional Development and the relevant province (Toxepeus, 2019). A committee is made up of a chairperson, a deputy chairperson and additional members, appointed by the Minister. Once constituted, the committee must develop a constitution that provides for its daily operations. While Committees of this nature are rare, to the point of virtual non-existence, communities may increasingly turn to this mechanism given the inability of municipalities to provide services despite community members paying their tariffs.

3.8 CHAPTER SUMMARY

This chapter focused on the policy context that guided and informed the study. A literature review solely focusing on the policy framework from a global level down to the local level enabled the researcher to understand how water as a resource is understood in terms of different policy that governments all over the world has put in place. Some of these policies have been shaped by emerging issues that did not exist many years ago. As a result, collaborative

responses have been developed by different governments and regional bodies to try and combat the contemporary household water delivery issues and challenges. The United Nations has revealed that over the past years, the UN water division has helped shape a global policy framework on disasters, climate change, sustainable development and other pressing issues to ensure a comprehensive policy framework that is functional even at a local level (United Nations, 2022).

CHAPTER 4: RESEARCH METHODOLOGY

4.1 Introduction

This chapter presents the research design, research approach, sampling method and data collection procedures that will be adopted by this study.

4.2 Research approach

There are three fundamental approaches to research; these approaches are qualitative, quantitative and a mixed method that incorporates the two research approaches (William, 2007). This research adopted both qualitative and quantitative approaches. This was appropriate for this research, given that it will assist the researcher to understand the holistic picture of the study from data obtained from key informant interviews and observation to the prevalence of traits in a population obtained from questionnaires, which add depth and breadth to the study.

A qualitative research approach is a means for “exploring and understanding the meaning individuals or groups ascribe to a social or human problem” (Creswell, et al., 2019). According to Kothari (2004), qualitative research approaches focus on the subjective assessment of attitudes, opinions and behaviour. Such an approach to research “generates results either in non-quantitative form or in the form which are not subjected to rigorous quantitative analysis” (Kothari, 2004). The qualitative approach to research was the most appropriate for this study, given that this study is characterised by its aim of proposing spatial planning strategies for improving household water service delivery in Schulzendal Village of Nkomazi Local Municipality, this generates words rather than rigorous statistical data. The qualitative data for this study was collected through a wide range of available literature related to the study topic like theories, concepts, and spatial planning strategies for household water service delivery. Furthermore, the idea behind qualitative research approach was to “purposefully select participants or sites (or documents or visual material)” in order to assist the researcher understand the research problem and the research question (Creswell, et al., 2019).

Quantitative research approach is an approach that places emphasis on numbers and figures in the collection and analysis of data (Eyisi, 2016). The use of scientific methods for data collection and analysis make generalization possible with this type of approach. Through this type of research approach, interaction made with one group can be generalized. Similarity, the

interpretation of research findings need not be seen as a mere coincidence. The quantitative approach was deemed to be essential for defining the statistical role that influenced this study. To this research, questionnaires were prepared and distributed to obtain numerical data from the respondents (households), and the sample was then generalised to the broader population. The quantitative data for this study derived from the population characteristics of the study area in terms which of them have access to clean potable water and which of them do not. The sampled population also formed part of the quantitative data and the fresh statistical data from the questionnaires also complemented the quality and reliability of the data that this study collected.

The integration of both qualitative and quantitative data in this study enabled methodological triangulation, which strengthened the credibility, validity, and depth of the research findings. The use of multiple data sources in this study reduced the limitations associated with using only one method, therefore enhancing the reliability and trustworthiness of the findings.

4.3 Research strategy.

This study adopted an exploratory case study research strategy as explained below:

4.3.1 Exploratory case study research strategy

A case study research strategy is “an empirical inquiry that investigates a contemporary phenomenon (e.g. a case), set within its real-world context, especially when the boundaries between phenomenon and context are not clearly evident” (Yin, 2012). The “case”, as defined by Miles & Huberman (1994) is a “phenomenon of some sort occurring in a bounded context”. Consequently, a “case” is generally a bounded entity (event, a person, organisation, social phenomenon, behavioural condition), but the boundary between the case and its contextual conditions – in both spatial and temporal dimensions – may be blurred (Creswell, et al., 2019).

Kothari (2004) defines a case study to be a rigorous study of a particular unit under consideration; it is a method of study in depth rather than breadth. A case study research strategy was suitable for this study given that it promoted close collaboration between the researcher and the participants and enabled the participants to share their views in respect to the condition of household water service delivery in Schulzendal Village, the challenges faced by Nkomazi Local Municipality in the delivery of household water services to Schulzendal Village and the spatial planning strategies for improving household water service delivery in Schulzendal Village of Nkomazi Local Municipality.

Baxter & Jack (2008) argues that there are different types of case studies. These are explanatory, exploratory, descriptive, multiple-case, intrinsic and instrumental case studies. For the purpose of this research, an exploratory case study was adopted, given that it explores situations whereby the intervention being evaluated has no clear, single set of outcomes. Moreover, it is a research design conducted about a research problem when there are few or no earlier studies to refer to or rely upon to predict an outcome (De Vaus, 2001). The key purpose of such studies is formulating a problem for more precise investigation (Kothari, 2004). An exploratory case study was suitable for this research given that there is a high level of uncertainty and ignorance about the research subject, therefore, it enabled the researcher to discover ideas and insights about spatial planning strategies for improving household water service delivery in Schulzental Village of Nkomazi Local Municipality.

4.4 Sampling Design

A sample design is a “definite plan for obtaining a sample from a given population. It refers to the technique or the procedure the researcher would adopt in selecting items for the sample” (Kothari, 2004). It lays down the number of items to be included in the sample, for an example, the size of the sample. According to the Nkomazi LM IDP 2021/22, Nkomazi Local Municipality population was at 410 830 in 2021 from the community survey that was conducted, and the recent population growth saw that number rising to 549 574 people as revealed in Nkomazi LM IDP 2023/24. The non-probability sampling design was adopted for this study as not all units have an equal chance of being selected as participants.

4.4.1 Sampling Frame

A sampling frame is the “source material or device from which a sample is drawn” (Särndal, Swensson, & Wretman, 2003). It is a list of all those who can be sampled from a population, which may include individuals, households, or institutions. According to Stats SA (2016 Community Survey - CS), Schulzental Village has a population of 3659 with 732 households and approximately 4-5 people residing in each household. The department that deals with water provision at Nkomazi Local Municipality is the Infrastructure Development Department. The department consists of four units: Water and Sanitation, Electricity, Project Management and Civil Services. Water provision is dealt with under the Water and Sanitation unit, and it has got 32 officials.

The municipality also has a Land use and development planning department with two units: Land use and Spatial Planning unit as well as building control unit. The spatial planning unit was more relevant, given that they are informed about the spatial distribution of services including household water. The unit has got four officials.

There are 2 traditional leaders in Schulzendal village. From this population, a sample of the study was selected. The sampling frame for this study included municipal officials, residents and traditional authorities because they are the ones who have first-hand information about the study area.

4.4.2 Sample unit.

Sample units are the members of the population from which measurements are taken during sampling. In this research, each unit was considered as an individual and inseparable unit when the selection was made. To this research, traditional leaders, households and the municipal officials constituted the sampling unit.

4.5 Sampling methods

For this research, convenience sampling, snowball sampling and purposive sampling methods were selected.

4.5.1 Convenience sampling

Convenience sampling method features selecting participants based on their availability and accessibility to the researcher, thus making them of convenience to the study (Emerson, 2015). It is also known as availability sampling, grab sampling or opportunity sampling. It can be biased because people are not randomly selected which can be a particular problem in the people recruited are too close to the researcher and they know that the researcher wants to achieve certain result through their study.

For this study, participants were chosen based on their accessibility and willingness to participate in the survey. This method enabled the study to efficiently collect data from a wide range of residents within the available time and logistical constraints.

4.5.2 Snowball sampling

Snowball Sampling is a non-probability sampling method that involves current research subjects helping to recruit future participants to contribute to the study findings. It can also be referred to as chain-referral sampling or chain sampling method. The existing study subjects can recruit future participants from amongst their acquaintances and the sample group can then be said to grow like a rolling snowball. It is often used in qualitative research when the population of the study is hard to reach or hidden. It is these characteristics of snowball sampling method that makes it a useful way to conduct research about people with specific characteristics that makes them difficult to identify. Snowball sampling also allows the investigator to continue with their investigations even in situations where they may not have access to potential subjects who meet inclusion into their study (Parker, Scott, and Geddes, 2019).

In this study, snowball sampling was used to identify and recruit community members who are directly affected by household water service delivery in Schulzental village. Given the informal nature of many settlements and the difficulty in accessing affected households, initial participants identified through local contacts and field visits were asked to refer other individuals experiencing similar household water service challenges. This method enabled the researcher to build a network of participants.

4.5.3 Purposive sampling

This research made use of non-probability sampling. It is a method of sampling that provides no foundation for calculating the likelihood of each item in the population being included in the sample (Kothari, 2004). Deliberate sampling, purposive sampling, and judgement sampling are all terms used to describe non-probability sampling. Qualitative research, in general, makes use of purposive sampling (Creswell, et al., 2019). Kothari (2004) further adds that in this sort of sampling, the researcher chooses the items for the sample on purpose; his decision on the items is final. This study purposively sampled traditional leaders and municipal officials to provide in-depth, extensive and quality data in relation to the study and their sample size is very small compared to the whole study area population. These individuals were deliberately chosen based on their expertise, decision-making roles, and direct involvement in household water service provision.

4.5.4 The study sample

It was impractical for the researcher to study the whole population. Therefore, a study sample was determined. Kothari (2004) argues that the sample size of the study should be determined in a way that it is not too small because that may not support the achievement of the study objectives and a sample that is too large may incur huge costs and waste resources.

The researcher had three units of analysis/sampling units: municipal officials, traditional leaders, and residents (households) of Schulzendal Village. To determine the households study sample, the researcher used the Rao software to determine the study sample size of 253 households. The researcher purposively selected 2 traditional leaders and 5 municipal officials. Therefore, the total sample size was 260.

Table 4.1: The study sample size
Source: Author (2024)

Research participants	Sampling frame	Sample size
Municipal officials	▪ Manager: Water demand and quality ▪ Manager: Water purification and reticulation ▪ Manager: Water & Sanitation ▪ Spatial Planner ▪ Senior Land Use Planner	5
Traditional leaders	▪ King ▪ Chief	2
Residents of Schulzendal village	▪ 732 households	253

4.6 Data collection procedure

There are two methods of data collection, these are primary data and secondary data. This study adopted both primary and secondary data collection methods.

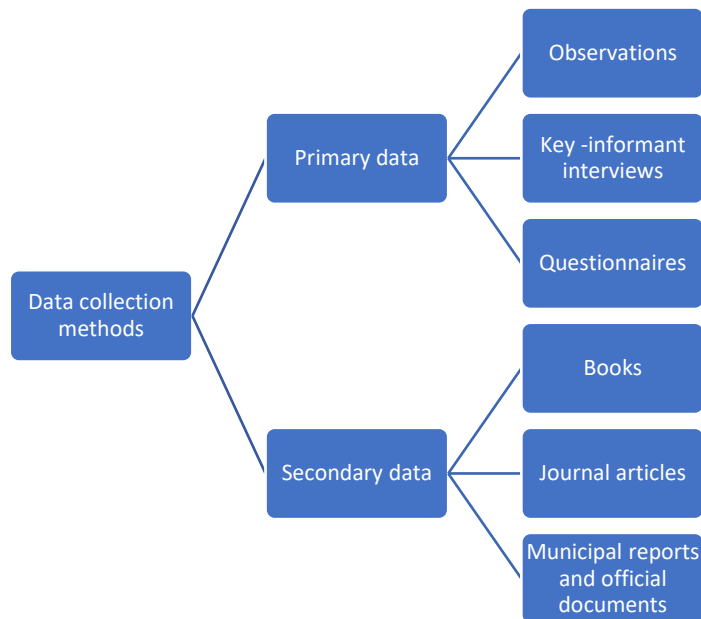


Figure 4.1: Data Collection Procedure
Source: Author (2024)

4.6.1 Primary data collection

Primary data is data that is “collected afresh and for the first time and thus happen to be original in character” (Kothari, 2004). There are several methods of collecting primary data, however, for the purpose of this research, observations, key informant interviews and questionnaires adopted.

4.6.1.1 Participatory Observation

This study’s data collection was first guided by a participatory observation. Participatory observation is a research methodology where the researcher is immersed in the day-to-day activities of the participants. The researcher joined a group (participants) as a participating member to get a first-hand perspective of the group and their activities. In this type of observation, instead of observing as an outsider, the researcher plays two roles at once— the role of an objective observer and a subjective participant (Ross, 2014). Participating in the group provided researcher an ability to experience events in the same way the participants/ residents experience them in terms of household water service delivery. Moreover, participatory observation set a stage for how questionnaires and interviews distribution and conduction.

4.6.1.2 Key informant interviews

Interviews are data collection methods that involve “presentation of oral-verbal stimuli and reply in terms of oral-verbal responses” (Kothari, 2004). According to Creswell (2009), key informant interviews are qualitative in-depth interviews with people who have information of what is happening in the study area and are likely to provide relevant information (Kumar, 1989). Key informant interviews were conducted to obtain information about the condition of household water service delivery in Schulzendal Village of NKLM, the challenges faced by the municipality in the delivery of household water services in Schulzendal Village and the spatial planning strategies for improving household water service delivery in Schulzendal Village of NKLM. This data collection method was appropriate for the study because it enabled the enquirer to obtain information from people who had first-hand information about the study area, these are the traditional leaders and the municipal officials of Nkomazi Local Municipality.

4.6.1.3 Questionnaires

A questionnaire is a research instrument that consists of a set of questions for the purpose of gathering information from respondents through a survey or statistical study (Gault, 1907). A research questionnaire is typically a mix of close-ended questions and open-ended questions (Roopa & Rani, 2012). Initially 253 questionnaires were distributed to the households of Schulzendal village to solicit information on the condition of household water service delivery in the village, the challenges faced by the municipality in the delivery of water services, as well as the strategies that to improve household water service delivery in Schulzendal village. Due to a greater interest in participating in the study 257 questionnaires were returned. I achieved a 100% response rate.

4.6.2 Secondary data

Secondary data refers to data that have already been gathered by someone else and have already gone through the statistical process (Kothari, 2004), thus called available data. This method of data collection is relevant because it provided profound understanding of the spatial planning strategies for improving household water service delivery in Schulzendal Village of NKLM. In this research, the researcher collected qualitative books, articles and documents. For instance, a book by Harold Lockwood and Stef Smits titled “Supporting rural water supply: a service delivery approach” and an article by Nkuna & Ngorima (2011) on the “challenges for

water service delivery and its impact on South Africa's rural communities". Moreover, secondary data comprised of public documents, for an example, newspapers, minutes of meetings as well as municipal reports or documents such as the Nkomazi Local Municipality Integrated Development Plan (IDPs), as well as Nkomazi Local Municipality Spatial Development Frameworks (SDFs) and the Nkomazi Local Municipality Service Delivery Budget Implementation Plan (SDBIP). Private documents such as emails were also used for information reference purposes.

4.7 Data analysis

This research adopted the deductive thematic network of qualitative data analysis. The thematic analysis theory helped the researcher to take a more exploratory perspective, encouraging one to consider and code all the data, allowing for new impressions to shape the interpretation in different and unexpected directions" (The Open University, 2019). The researcher used thematic analysis to analyse data using a descriptive theme to structure the study to align it with the key informant interview's structure. It was most effective given that it enabled the researcher to identify common ideas and themes that came up repeatedly in data obtained from key informant interviews. Data obtained by observations was also analysed using thematic network analysis.

In order to analyse quantitative data, percentile descriptive statistics and inferential statistics was adopted to enable the study to identify what percentage of Schulzendal population lie below the national norms and standards for household water service delivery. Descriptive statistics means the "discipline of quantitatively describing the main features of a collection of data" (Kothari, 2004). It involves summarizing a sample and then using the information gathered to make inferences about the broader population that the sample represents. The quantitative data gathered through questionnaires was analysed with the aid of a statistical data analysis software called Statistical Package for the Social Sciences (SPSS). Percentages were generated through SPSS.

4.8 Data presentation

Qualitative data from key informant interviews and analysed by the thematic network was then presented through write-ups, which includes the key points and shared ideas that relates to the study objectives. Data collected through observations was interpreted using photographs, maps

and write-ups in order to emphasise the details. Tables were also used to present the qualitative data obtained.

The quantitative data that was presented using bar graphs, pie charts and tables. Descriptive statistics enabled the organization of data in a clearer format, making it easier to interpret and understand.

4.9 Expected Outcomes

The expected outcome of this study included the current situation of household water service delivery in Schulzendal village, the challenges faced by the Nkomazi Local Municipality in the delivery of household water services and the spatial planning strategies to improve household water service delivery in Schulzendal village.

4.10 Ethical considerations

The researcher followed ethical research standards as stipulated in Chapter 13 of the University of Venda's Research and Innovation Policy (2010). The Researcher also applied and obtained an ethical clearance certificate from University of Venda after proposal presentations to the faculty board. Prior collecting data from the participants, the researcher ensured that informed consent is obtained, and participants were also provided with the rights to withdraw from participating. The study maintained and protected anonymity and confidentiality of participants. Lastly, the researcher will acknowledge the use of other author's work using the Harvard referencing system.

4.11 Methodological summary

Table 4.2: Methodological Summary of the Study

Source: Author (2025)

Research Objectives	How the objective was achieved
To ascertain the condition of household water service delivery in Schulzendal Village of Nkomazi Local Municipality.	Data collection tools such as observation checklist, Questionnaires and Key informant interviews were used to uncover various aspects related to the condition quo of household water provision in Schulzendal Village.
To determine the challenges faced by Nkomazi Local Municipality in the delivery of household water services to Schulzendal Village.	Questionnaires targeted at Municipal Officials and Traditional Authority leaders allowed the researcher to have an in-depth understanding of the challenges directly from the leaders and the local authority.
To propose spatial planning strategies for improving household water service delivery in Schulzendal Village of Nkomazi local municipality.	This study underwent a thorough literature review to find the best ways and strategies that are tailored towards solving household water service delivery issues guided by a globally reviewed and understood models.

4.12 Limitations of the study

Throughout this study, the researcher has experienced various limitations both controlled and uncontrolled. The controlled limitations for this study included Geographical limitations in terms of study areas/focus, Theoretical limitations in terms of the research topic and focus of the study in line with the set research objectives and related questions. However, it is the uncontrolled limitations that would determine the quality, course, and duration of this study in the end as the information that the researcher collects will end up as a guide on the direction and meeting all the objectives for the study.

Time constraints or limitations were the ones playing a major role together with access to information. Schulzendal village is located in a rural area where information administration

and filing have challenges especially in Traditional Authorities headquarters where it is difficult to find any literature or recorded information from years back. Alternatively, the municipality is also faced with various financial challenges to establish a well-functioning administration and record keeping for information or data that could be crucial to the study. As a result, the research was limited to only recent information and data collection methods such as interviews from the locals, municipality and the affected traditional authorities.

4.13 Chapter Summary

This chapter identified a well-structured research methodology that is tailored to solve challenges of household water provision in rural areas. This was achieved through identifying a suitable research approach, strategy and sampling design to make sure that the data collection process that will follow will be able to successfully answer the set research questions to meet the desired research objectives. The sampling methods used also ensured that the population sample that was used will closely resemble the condition quo and that it is distributed in a fair manner across the study area. The data collection procedures were also tailored to uproot possible causes of household water service delivery issues within a rural and marginalised settlement. The expected outcomes of the study helped the researcher project the condition quo to possible ways that the existing problems can be solved, and possible consequences should such problems be neglected. As a result, the researcher also considered various ethical considerations to avoid compromising the findings of this study.

CHAPTER 5: THE CONDITION OF HOUSEHOLD WATER SERVICE DELIVERY IN SCHULZENDAL VILLAGE OF NKOMAZI LOCAL MUNICIPALITY.

5.1 Introduction

This chapter presents a comprehensive analysis and detailed presentation of the data collected regarding objective 1: to ascertain the condition of water service delivery in Schulzental village of Nkomazi Local Municipality. The chapter begins by addressing the methodological note, followed by demographic data, sources of water, the distance travelled to access water, water infrastructure, water quality, and the availability and reliability of water access.

5.2 Methodological note

The data presented in this chapter was collected through a combination of questionnaires, key informant interviews, and observations to gain a deeper understanding of the condition of water service delivery in Schulzental village.

The researcher initially distributed 253 questionnaires, but due to the higher number of retired and unemployed individuals facing challenges related to water access in the village, there was a greater interest in participating in the study. As a result, 257 questionnaires were returned, achieving a 100% response. Key informants also provided valuable input (five municipal officials and the two traditional leaders).

This chapter incorporated various data analysis procedures including descriptive analysis where inferences will be drawn from statistics obtained from interviews, observations, and interviews conducted throughout the study, this will add more quality and reliability to the data presented (Tumiran, 2024). Diagnostic analysis will help the researcher to correlate and examine the relationships between variables such as water sources and walking distance to water sources, this can be further cemented by regression analysis which will help determine the extent to which the independent variable (Distance to water sources) will predict dependant variables (water sources/availability) (Arkes, 2023)

5.3 Sources of water

This section outlines the various water sources relied upon by the residents of Schulzental Village. According to Shiklomanov (1993), water sources refer to both natural and man-made

sites where water is gathered or stored and from which it is drawn to serve human, ecological, or industrial purposes. These sources include, but are not limited to, communal taps, standpipes, boreholes, rivers, water delivery trucks, and dams.

In developing nations, it is common for households to receive water from a single, consistent supply, typically high-standard municipal systems, sometimes supplemented by bottled water. However, in low- and middle-income countries, households frequently depend on a variety of sources to fulfil their daily water requirements. These sources may vary by purpose and often shift with the seasons (Elliot et al., 2019). This has also been the case in Schulzental Village as findings indicate that residents use several water sources including communal taps, stand taps, communal borehole, water takers, the dam and private bought water as shown in the figure below.

Table 5.1: Sources of Water

Source: Author (2024)

Water sources	Number of households	Percentage of households
Tap in stand	55	21
Communal tap	91	35
Communal Borehole	38	15
Water tankers	10	4
Buy from Private	7	3
Dam	56	22
Total	257	100

5.3.1 Communal taps

The findings indicate that households with a tap in stand makes up 21% of the respondents while households which relies on the communal taps makes up 35%, those who rely on communal borehole makes up 15% of the respondents, and water tankers services only 4% of the respondents, and those who buy water from private makes up 3% of the respondents while the dam only serviced 22% of the respondents. the most common water source for the community is communal taps, as shown by 35% in Table 5.1 above. The community relies on two communal taps which are all fully functional; however, they do not provide water every day and this creates challenges for the residents, as they are dependent on these taps for their

daily water needs, and the inconsistency in water availability leads to periods of water scarcity. During such times, the village use the dam as an alternative, it is not safe and sometimes pose health hazards. For those who can afford, they rely on private individuals who sell water.

Communal taps are common in South African rural areas, they are used when people lack direct access to private household water connections (Hofstetter et al, 2021). These communal taps usually belong to local municipalities to provide water to multiple households at once, but they can also lead to issues of long queues, water theft, and contamination (Akinboade & Kinfack, 2012).

The following Plate below indicates the condition of communal taps in Schulzendal village with the first frame showing illegal communal taps connections (theft) and the second one showing the usual communal taps provided.



Plate 5.1: Communal taps

Source: Author (2025)

The heavy reliance on communal water sources in Schulzendal village highlights the limited access to individual water connections such as standpipes, which lead to challenges in water distribution, particularly during water shortages and infrastructure breakdowns. This is

different from what is happening in rural areas of developed countries, municipal stand taps have been provided in rural communities ensuring that everyone has access to household water (Elliot, et al., 2019).

Municipalities are given the mandate of providing water services to communities within their jurisdictions through the Municipal Systems Act 32 (2000). Municipal officials indicated that they are trying to carry out this mandate and provide basic services to Schulzendal Village, however, the village is not a planning area because the land is not proclaimed. This means the village is under the administration of Matsamo Traditional Authority who should work in conjunction with the National Government (Department of Water Affairs) to provide water to unproclaimed areas within the village (Tapela, 2015). From a space production perspective, this shows that the village has been excluded from Municipal Planning and will have to resort to lengthy methods or intervention processes from the national government.

A municipal planning area refers to a designated geographic region within a municipality where planning and development activities are carried out (National Planning Commission of South Africa, 2013). Such an area is defined for the purpose of organizing public services and other activities to ensure sustainable and orderly growth. This planning issue has resulted in the quite limited provision of water services within Schulzendal village, and this is left under the hands of traditional leaders. During the interview conducted, the traditional leaders also pointed out that liaising with the national government to combat water provision issues is a lengthy process as they do not have administrative offices within the vicinity of the village and will have to wait for appointments and delegation of officials to villages where water service delivery issues can then be addressed.

5.3.2 Stand taps/pipes

During the study, the researcher observed that there are limited number of stand taps/pipes available in the village. Findings also indicated that 55 (21%) households have taps/pipes in their yards and are fully functional. These are not enough compared to the population of Schulzendal village comprising of approximately 275 households. The South African Water Services Act 108 of 1997 and the National Water Act 36 of 1998, clearly indicate that every household must have access to tap within a 200-meter radius of walking distance. Moreover, the World Health Organization as well as the United Nations SDGs (Target 6.1) clearly indicate that water sources should be within 500 meters of households. This shows that Schulzendal

community falls amongst the unprivileged, marginalised and disadvantaged communities as they are deprived of their constitutional and legislative rights to water access and provision.

The limited stand taps and inadequate access to water has led to several residents locking their taps during the day and overnight. This measure is taken to prevent other community members from flooding their homesteads to ask for water. This reflects the broader challenge of water scarcity, where residents are forced to take extreme steps to secure their limited water supply. One of the residents indicated that they had to go door to door asking those with stand taps for water, but in some households, no one responded to them and as the taps were locked, they had to leave without water. From this study's theoretical perspective, this means that there is a division within Schulzandal community where those without stand taps could be seen as annoying and poor by those who have stand taps. This further creates social division and exclusions amongst community members and might make it more difficult for the community to combat water service delivery in the village as a united front.

Plate 5.3 below shows the condition of stand taps in Schulzandal village that are always locked by the household owners to prevent those without stand taps from accessing water



Plate 5.2: Stand Taps
Source: Author (2024)

5.3.3 Communal borehole

Boreholes proved to be the most reliable source for meeting rural water demand in sub-Saharan Africa (MacDonald & Davies, 2000). My research findings indicate that there are 38 households in Schulzendal village who rely heavily on a just one communal borehole available for the village, as reflected by the 15% of households in Table 5.1 However, this communal borehole is generally in poor condition and the community has raised concerns that the borehole is often dry, making it difficult for them to access water consistently as shown in the picture below. This situation severely impacts the daily lives of the community, especially since they depend on one borehole for their household's water needs.

A similar situation has been observed in rural parts of Kenya, where many communities depend on communal boreholes as a primary water source (Christine et al, 2018). However, during periods of drought, these boreholes frequently run dry, forcing residents to travel long distances to find alternative water sources, often from contaminated or unsafe locations (Seneviratne, Khandlhela, & Ebert, 2019).

Plate 5.4 below shows the condition of the only communal borehole in Schulzendal Village.



Plate 5.3: Communal Borehole
Source: Author (2024).

From the absence of moisture around the borehole, it is evident that this borehole is mostly dry, the Matsamo Traditional Authority has indicated that the borehole was installed by the national government and has not been maintained for long periods. This coupled with climate change challenges has resulted in the borehole being obsolete most of the time (Alhassan & Hadwen, 2017). The community has indicated that they live as if they do not have a borehole in the village as it is hardly a reliable water source. Matsamo Traditional Authority has concluded that efforts are being made with the department of water affairs to investigate the main causes of water unavailability from the borehole and possible solutions and measures that should be taken to remedy the situation.

5.3.4 Water tanks

Some of the community members rely on water delivered by water tankers provided by the municipality, as indicated 4% on Table 5.1 above. Although the local municipality indicated that Schulzental village is not a proclaimed municipal area, they assist with water tankers through co-operating governance in conjunction with the Traditional Authorities and National Government (DWA) providing a critical source of water when other supply systems are not functioning. However, there is a significant challenge with this system, for example, if some of the community members arrive too late, they often find that the water has already been distributed to other community members and is no longer available. This situation creates a sense of urgency and frustration among community members, as those who are unable to access water from the tanks are forced to seek alternative sources, which may be unreliable or unsafe. One resident indicated that sometimes they are forced to use undrinkable water from the dams as it is the only alternative source they use as a last resort.

This issue can be explained through the Access to Basic Services Theory, which suggests that when centralized systems fail, vulnerable communities often become dependent on secondary options, for example, temporary sources of supply like water tankers from the local municipality. This also means that while these systems are intended to provide a stopgap measure, their efficiency is compromised by logistical challenges, such as delays in distribution or competition for limited resources (Coffey, MacFarlane, & Theobald, 2019).

Plate 5.5 below shows communal water tanks that are filled by the local municipality that at random intervals depending on water availability. More often than not, the tanks are usually

empty as the demand for water within the village has resulted in the tanks being depleted as soon as they are filled leaving other community members without water.

Introduce photograph as municipal storage facilities. How often are they filled and replenished?



Plate 5.4: Water Tanks

Source: Author (2024)

5.3.5 Buying water from private suppliers

At least 3% of the community as indicated in Table 5.1 buy water from businesspeople. These water suppliers fetch water from the nearest dam and sell it to residents who do not have access to other reliable water sources. These individuals have identified a business opportunity by providing water to those who are unable to rely on the water supply from boreholes or other public water points. Water is usually sold at R550 to fill a 3 000-litre tank, water is usually sold in a large capacity as the private suppliers usually sell to those who own tanks and do not sell in small capacity like the usual 20/25 litre water buckets. The suppliers use generators to siphon water directly from the river and fill their tanks which they usually keep at the back of their vans or trucks and then deliver it on an as needed basis, currently they do not have any means of storing or purifying the water they get from dams, and they deliver it in poor quality. Those who can afford to buy water usually buy once every month and for those who have more tanks they can fill as much as 2 or 3 month of water and only buy when they run out.

Plate 5.6 below shows the water trucks and vans that private individuals use to collect water from the dam and then sell to community members.



Plate 5.5: Private Water Suppliers

Source: Author (2024)

While this practice of buying water helps meet an immediate need, it raises concerns about both the quality and cost of the water. The water fetched from the dam may not always be safe or clean, and without proper filtration or treatment, it can pose health risks to the consumers. Additionally, the price of this water may not be affordable for everyone, as most of the population is unemployed and old.

5.3.6 Schulzendal Dam

The findings indicate that 56 households (22%) in Schulzendal village get water straight from the dam. This practice can be understood through the water access and resource management theory, which highlights how communities in resource-scarce areas often rely on alternative or less conventional sources of water when centralized systems are unavailable or unreliable (Molle, 2009). In the absence of a consistent municipal water supply, residents turn to sources like dams as coping mechanisms to meet their daily water needs. However, Ringwood (2015) pointed out that water from Schulzendal School complex that was sourced from the same Schulzendal dam was not of potable use meaning that it is not safe or healthy enough to use as drinking water.

Plate 5.7 shows Driekoppies Dam which is fed by Schulzendal river and relies on rainfall.



Plate 5.6: Driekoppies Dam
Source: Author (2024)

5.4 Distance travelled to access water

In South Africa, the Water Services Act 108 of 1997 stipulates that water should be made available to people within 200 meters of their houses, and the water source but be an suitable for meeting households needs. However, this is not the case for Schulzental village as findings indicate that a significant 44% of respondents reported that they travel more than 200 meters to access water from communal taps and the community borehole, while 28.4% have water sources within 100 meters of their homes. Moreover, the traditional leader reported that “there are not enough taps and tanks, and many people have to walk long distances to get water, some must walk more than two kilometers to fetch water from a communal tap” (Interview F). This affects mostly women and children since they are mostly the ones responsible for fetching water. This highlights the need for water sources that are nearby households.

Myers & Hansen (2020) explained through the theory of access and argued that many women and children are still excluded or side-lined from accessing household water within a reasonable distance in terms of legislation. This was further highlighted by Nygren et al, 2016 who indicated that fetching potable water from a long distance is a significant burden that affects household water quantity and quality.

Some of the community members revealed that they are forced to fetch water form long distances and would even enlist the help of their children who are still at school, this affects their performance at school as well as they do not get enough time to focus on their studies and are usually tired from carrying water buckets over long distances which affect their focus at school. Figure 5.1 below indicates the distance travelled to access water versus the percentage of Schulzental community that travels. This means that a lot of community members from Schulzental village travel long distances to access water.

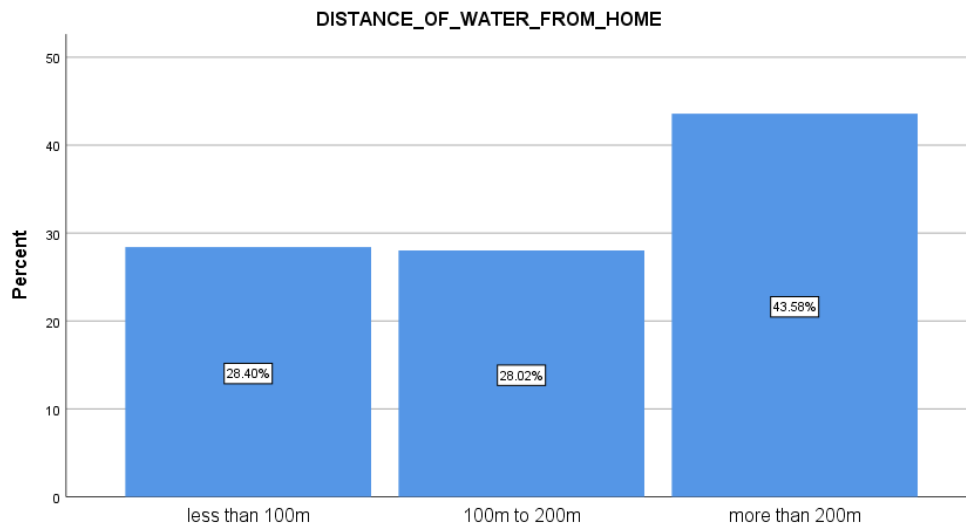


Figure 5.1: Distance travelled to access water

Source: Author

The issue of distance in accessing water can also be supported by the use of wheelbarrows by community members as the researcher observed. Residents have been observed pushing wheelbarrows to transport water from communal taps or even from their neighbours who have standpipes as seen in the picture below. This practice helps reduce the number of trips required to collect water, making it more efficient, especially in areas where water points are located far from homes.

Plate 5.8 below shows different means that Schulzendal community uses to fetch water from different sources.



Plate 5.7: Ways Community use to fetch water

Source: Author

A wheelbarrow helps community members to carry more water at once, significantly reducing the number of trips required to get enough water for the household. For example, a person can only carry one 20/25 litre bucket. But using a wheelbarrow, one could carry three buckets giving them a maximum of 75 litres at once. So, to fill a 120-litre barrel, one would only need two trips with a wheelbarrow instead of at least six round trips that would be required if one is using a 20-litre bucket.

5.5 The condition of water infrastructure

The study found that the water infrastructure in Schulzendal Village such as communal taps, stand taps, communal water tanks as well as the communal borehole, are significantly inadequate. Participants indicated that “the water infrastructure is in very poor condition, here are not enough taps and tanks, and the existing ones are often broken or not working properly” (Interview G). This lack of adequate water infrastructure forces residents to rely on distant and unsafe water sources, which negatively impacts their lives and also poses a risk to their health and wellbeing.

According to municipal officials, “the ageing infrastructure is a problem caused by the influx of foreign nationals from the neighbouring countries such as Eswatini into the village since it is closer to the Swazi Border Post which leads to Eswatini” (Interview D). The location of Schulzendal Village in the periphery of Eswatini makes it a peri-urban zone. This setup aligns with the Urbanization and Infrastructure Theory, which suggests that rapid population growth, often driven by “migration or urbanization, places significant strain on existing infrastructure, making it increasingly difficult to meet the needs of both current and new residents” (Satterthwaite, 2012).

This issue is similar to what has been observed in many other regions globally, such as in parts of Venezuela, where rapid population increases due to migration have overwhelmed local water infrastructure. In Caracas, for example, the influx of migrants has led to chronic shortages of water, with many areas relying on unsafe or inadequate water sources (Perez, 2019).

Plate 5.9 below shows the broken and poorly maintained pipes that exacerbates the daily struggle for water access in the village. Poor infrastructure not only hinders easy access to water but also increases the burden on residents, especially during adverse weather conditions.



Plate 5.8: Water Infrastructure conditions

Source: Author (2024)

5.6 Water Quality

On the issue of water quality, no laboratory tests were done. I relied on the information provided by the respondents as well as observations. Municipal officials reported “the water quality is poor, with reports of contamination being common”. The water's poor quality, characterized by "a strange smell and tastes bad" (Interview E). Such observable water quality features make it unsuitable for drinking and other household uses. Contaminated water can cause health issues like waterborne diseases. In Schulzendal Village, the water quality is compromised by contaminants, poor maintenance of delivery systems, and natural factors, making it unsafe for use. Even though the community has highlighted that drinking non potable water could come with health risks, they have no other option but to boil the water as it is and add a teaspoon of bleach as advised by the health officials (Gumbi, 2020). On the other hand, the Municipality has supported the commune from health officials on educating the community on measures to take to prevent waterborne diseases that could arise from the community drinking untreated water but have highlighted on the importance of coming up with a permanent and constitutional solution as they await intervention from the national government.

Residents further explained that sometimes they do not trust the water from the taps and would prefer to buy bottled water, but it is expensive. This indeed proves the lack of trust in the local water supply and the economic burden placed on residents who resort to buying bottled water for safety. The observations also confirmed these findings because tap water showed visible discoloration while no local water monitoring programs existed. Given the strong alignment across all data sources, it is evident that water quality in Schulzental is a significant health hazard, necessitating immediate improvements in water purification and monitoring efforts

Plate 5.10 below shows the quality of tap water from a household in Schulzental village.



Plate 5.9: Dirty Water from the pipe

Source: Author (2025)

5.7 Reliability of the available water sources

Participants reported that availability is highly unreliable, with frequent shortages and outages as indicated by 22% of the respondents who would usually rely to fetch water from the Dam as an alternate source of water during water scarcity periods. This unreliability forces residents to store water whenever it is available and find alternative sources during outages, significantly disrupting their daily routines.

Observations backed up these findings by showing that households in Schulzendal Village used big water containers for storing extra water using 20 litre buckets, 25 litres containers as well as 60 litres barrels. This pattern of behaviour is common in rural parts of South Africa, as residents in areas with unreliable water infrastructure also store water in large containers to prepare for supply disruptions. During times of water outages, people in rely on stored water (Van der Walt & Yates, 2019). The struggles faced by residents of Schulzendal village are not unique but are shared by many South African communities in areas with similar water access issues. Plate 5.11 below shows the 60 litres as well as the 25 litres water storages containers



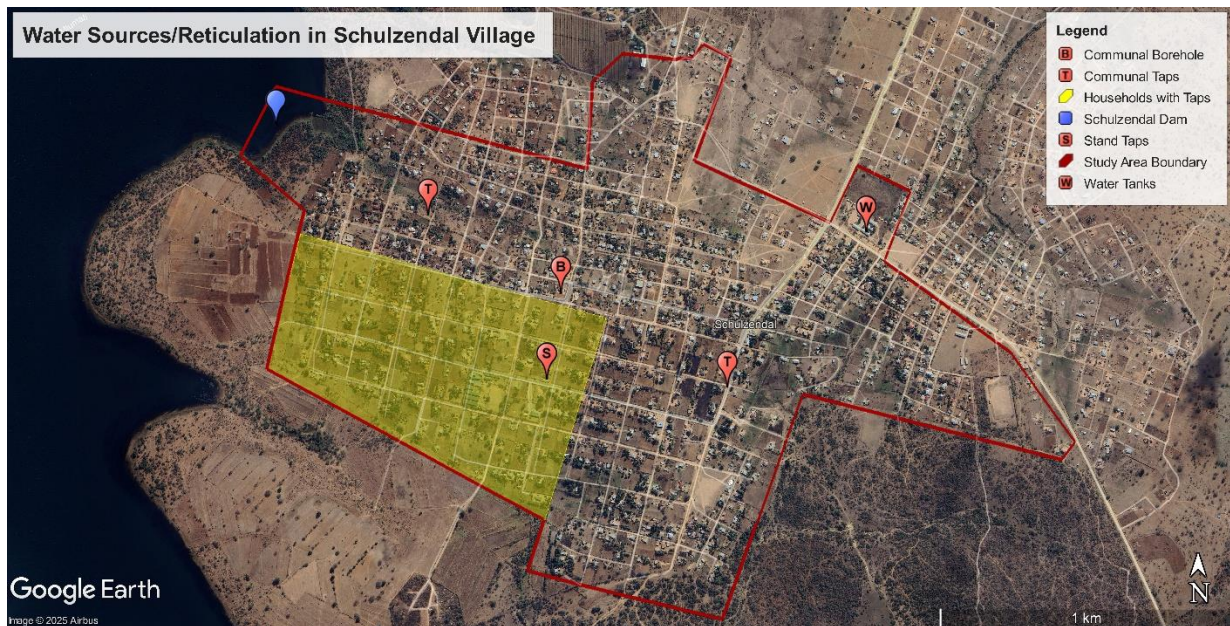
Plate 5.10: Stored Water

Source: Author (2024)

5.8 Location of the water sources

In Schulzendal village the water sources are not centralized, which creates challenges for many residents in accessing water for their daily household needs. The water sources are scattered across the village, and some households especially those located farther away from these sources face challenges in collecting water for their household needs. This often leads to long walks to distant water sources, which consumes valuable time and energy (World Health Organization, 2021). Moreover, the lack of reliable access to water can leads to health issues, as some families may be forced to use contaminated or unsafe water, contributing to the spread of waterborne diseases such as cholera (UNICEF, 2020).

The map below highlights the location of water sources and reticulation infrastructure in Schulzendal Village.



Map 5.1: Water Sources/Reticulation infrastructure in Schulzendaal Village

Source: Author (2024)

The spatial spread of Schulzendaal water reticulation infrastructure is evenly distributed across the village. The Dam is located on the Eastern Edge of the village where some of the community members use to access water in days of water scarcity. The communal taps are evenly distributed on the eastern and western edge of the village with the communal borehole on the centre of the village. The water tanks are located on the Northern edge of the village and on the southeastern edge of the village are households with taps within their stand. The spatial spread of water reticulation in Schulzendaal village is properly planned with the village evenly covered. However, it is the availability of water from that disturbs this harmony as residents rely on water from the Dam/Households with taps during water scarcity days leading to imbalances in the distribution of water sources as they would be located only on the southeastern edge of the village.

This issue is not unique to Schulzendaal as similar challenges are faced in many rural and underdeveloped areas around the world. For instance, in parts of sub-Saharan Africa, such as rural Kenya or Uganda, decentralized water sources are common, and residents often must walk long distances to fetch water. This creates gender disparities, as women and children are typically responsible for collecting water, which affects their education and economic opportunities (UN Women, 2019). Similarly, in rural India, many villages face the same issue, where water sources like wells or hand pumps are not easily accessible to all households. The

lack of a centralized system often results in inequality, with more remote or marginalized areas being disproportionately affected (WaterAid, 2018).

In contrast, countries with well-established water infrastructure, such as those in Europe or parts of North America, have adopted centralized water supply systems that ensure all residents have equitable and reliable access to clean water. These systems typically involve extensive networks of pipes, reservoirs, and treatment plants, which provide water directly to homes, reducing the challenges that come with decentralized access. Such systems not only improve the quality of life for residents but also promote better health, hygiene, and social equity (OECD, 2019).

The decentralized water access problem is a pressing issue not only in Schulzendal, but also in many regions worldwide and there is a need to come up with spatial planning strategies to alleviate the hardships faced by those living in areas like Schulzendal when it comes to water access.

5.9 Chapter summary

This chapter revealed that residents of Schulzendal Village are highly dissatisfied with the state of water service delivery. Most of the respondents complained of poor infrastructure, poor quality of water and even water supply chain which has a drastic impact on their lives. They reveal the acute need for carrying out a massive investment on structures and infrastructure, water resources utilisation and enhancement of reliability of services. In conclusion, this chapter highlights the need to solve these systemic problems in a bid to enhance water service delivery and increase the standards of living amongst residents.

CHAPTER 6: CHALLENGES FACED BY NKOMAZI LOCAL MUNICIPALITY IN THE DELIVERY OF HOUSEHOLD WATER SERVICES TO SCHULZENDAL VILLAGE.

6.1 Introduction

This chapter presents a comprehensive analysis and detailed presentation of the data collected regarding objective 2: the challenges faced by Nkomazi Local Municipality in the delivery of household water services to Schulzendal Village. The chapter begins by addressing the methodological note, followed by the challenges as well as the chapter summary.

6.2 Methodological note

The information presented in this chapter was gathered using both primary and secondary sources. Primary data collection methods comprised of questionnaires, interviews with key informants, and direct observations, all aimed at gaining a comprehensive understanding of the challenges experienced by Nkomazi Local Municipality in delivering household water services to Schulzendal Village. In addition, secondary data was obtained from a variety of publicly available documents, such as newspapers, academic books, journal articles, and official municipal records, including the Nkomazi Local Municipality's Integrated Development Plans (IDPs).

6.3 Challenges faced by Nkomazi Local Municipality in the delivery of household water services to Schulzendal Village

This section outlines the key challenges encountered by the Nkomazi Local Municipality in its efforts to deliver household water to the community of Schulzendal Village. According to participants, one of the primary challenges is the municipality's limited financial capacity, which hampers both the expansion and upkeep of water infrastructure. Revenue collection remains low, largely due to non-payment for services by residents, further straining the municipality's budget. A growing population, coupled with the ongoing impacts of climate change, has led to a surge in water demand, putting additional pressure on an already overstretched system.

Participants also highlighted several operational difficulties, including persistent technical issues, logistical challenges, and slow administrative processes, all of which have negatively

affected service delivery. These challenges are heightened by political interference, internal corruption, and reported incidents of fraud within the municipality. Dilapidated infrastructure, particularly in Schulzendal Village, has further worsened the situation.

Moreover, challenges related to land tenure, a lack of community engagement in decision-making processes, and the lack of community-based water management systems were mentioned as key challenges. The issue of undocumented immigration was also raised, as it affects both service planning and resource allocation.

6.3.1 Municipal Financial constraints

According to Section 153(a) and (b) of South Africa's 1996 Constitution, municipalities are mandated to focus on community development through effective budgeting and planning, prioritizing basic needs and advancing both social and economic growth. However, this is not the case in Schulzendal Village as participants indicated that *"The main problem is that there isn't enough money to fix and maintain the infrastructure"* and *"we need more funding to improve the water services, but the budget is very tight."* (Interview A; Interview C).

Financial constraints also prevent the municipality from adequately repairing and upgrading infrastructure, purchasing new equipment, and hiring skilled workers to maintain the water systems *"The financial issues make it hard to buy new equipment or even pay for repairs Without proper funding, we can't hire enough skilled workers to maintain the water systems."* (Interview B).

This issue of financial constraints in water service delivery is not unique to Schulzendal village, it is a common challenge in both developing and underdeveloped countries. In numerous developing nations, water provision suffer from a lack of funding due to restricted government budgets, privatization efforts, or challenging economic circumstances (Swyngedouw, 2004). For example, in Sub-Saharan Africa, the lack of investment in water infrastructure and the government limited capacity to finance water provision result in unreliable and inadequate water supply in rural communities (Grey & Sadoff, 2007). In these situations, financial limitations have a direct impact on access to clean water, hindering municipalities' ability to upkeep and enhance water infrastructure.

This financial challenge can also be explained through the Principal-Agent Theory (PAT). When applied to public services like water, the PAT discusses the relationship between the government (which is the principal in this case), and the public service providers or administrators (the agents). If financial incentives or oversight mechanisms are weak, there may be a failure to meet service delivery expectations (Shleifer & Vishny, 1997).

6.3.2 Non-payment of municipal rates and services by residents

Municipal officials indicated that one of the major challenges facing the Nkomazi Local Municipality in its efforts to deliver water services, particularly to Schulzendal village and other rural communities, is the persistent issue of non-payment for municipal rates and services. A significant portion of residents either cannot afford or choose not to pay for basic services, which directly impacts the municipality's revenue base. This shortfall severely limits the municipality's capacity to invest in water infrastructure, maintain existing systems, and expand services to underdeveloped areas.

The financial strain caused by widespread non-payment is especially problematic in rural parts of Nkomazi, where access to clean and reliable water remains inconsistent. Without adequate funding, the municipality struggles to repair pipelines, extend water networks, or invest in long-term water sustainability projects. These financial constraints are compounded by rising operational costs and growing demand, leading to service delivery backlogs and public dissatisfaction (NKLM IDP 2020/2021).

This situation is not unique to Nkomazi. Across many parts of South Africa, municipalities face similar challenges due to low payment compliance among residents. According to the State of Local Government Finance report (2019) by the South African Local Government Association, revenue collection remains a critical barrier to effective service delivery, particularly in historically underserved and rural communities. COGTA also highlighted that a lack of consumer education, poverty, and perceptions of poor service delivery contribute to widespread non-payment.

6.3.3 Rise in water demand due to population growth

Globally, the issue of increasing water demand is a major challenge. According to UN Water (2018), water demand increases globally because of population growth and industrialization, putting pressure existing water infrastructure and supply systems. Schulzendal village is

experiencing similar challenges as it is closer to Matsamo boarder gate and suffers from influx of people from Swaziland. This is supported by the 60% of respondents agreeing or strongly agreeing that there is an increase in demand, it suggests that a majority of the community is noticing the pressure on the water supply. On the other hand, 21.8% of respondents are neutral or disagree, indicating that a portion of the population might not perceive the issue as critically or may have different factors influencing their response as shown in Figure 6.1 below. Figure 6.1 Indicates the rise in water demand as indicated by households of Schulzendal village.

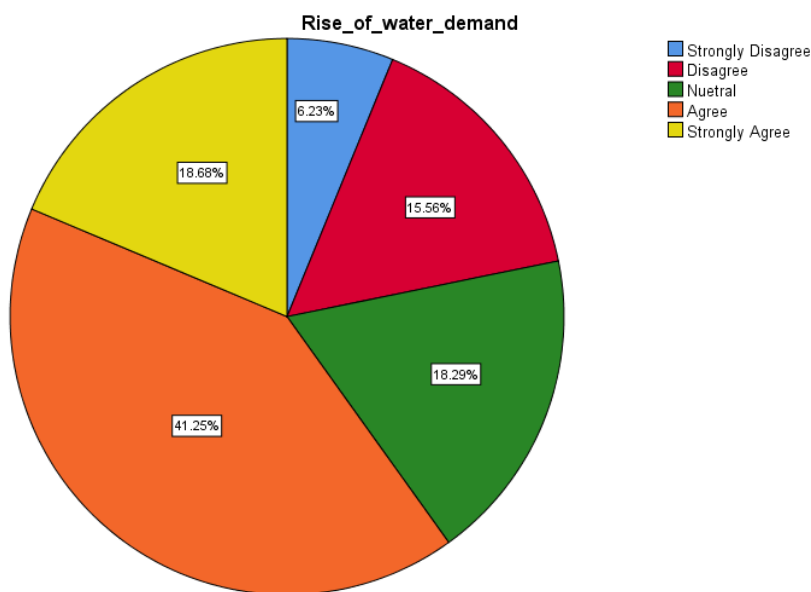


Figure 6.1: Rise in Water Demand

Source: Author (2024).

The challenge of increasing water demand can also be explained by the lens of the public good theory, as water is a public good that must be managed by the municipality and also ensure that households have access while balancing supply with demand. As the demand for water increases because of population growth and limited water resources, the municipality is challenged in its delivery.

6.3.4 Climate change challenges in water provision

Climate change poses a growing challenge for the Nkomazi Local Municipality, particularly in its efforts to provide a consistent water supply to rural areas such as Schulzendal village and other areas within the municipal jurisdiction. The Municipality is located in the Lowveld region and “experiences increased water insecurity due to prolonged dry spells and extreme weather

events” (SANBI, 2016). These environmental shifts have led to the drying up of the dam and boreholes, which many households in the village depend on for daily use.

As climate variability intensifies, the municipality is under pressure to adapt its water infrastructure and resource management practices to ensure reliable access for vulnerable communities. However, limited financial capacity and other challenges make it difficult for the municipality to implement long-term climate resilience strategies (NKLM IDP 2020/2021). Similar patterns have been observed across Southern Africa, where rural municipalities are extremely affected by climate-related water issues.

This challenge is also evident in countries like India, rural districts in the states of Maharashtra and Rajasthan have experienced recurring droughts, severely reducing groundwater levels and disrupting agricultural and domestic water use (World Bank, Groundwater Depletion in India: Policy Challenges and Opportunities, 2018). Similarly, in Sub-Saharan Africa, countries like Ethiopia and Kenya face constant challenges in rural water provision due to changing rainfall patterns and increasing evaporation rates caused by climate change (UNICEF, 2021).

6.3.5 Municipal logistical and technical challenges in water delivery

Participants discussed various logistical and technical challenges that affect effective water service delivery in Schulzendal village. These include difficulties accessing remote areas, a shortage of skilled technicians, and outdated technology *"Reaching some of the remote areas is very difficult, especially with the poor road conditions."* (Interview B). Participants further indicated that *"Reaching some of the remote areas is very difficult, especially with the poor road conditions."* and *"We don't have enough skilled technicians to handle the maintenance and repairs."* – (Interview B; Interview A). Such challenges cause delays in maintenance and repairs, further aggravating the already poor water service situation. The lack of skilled workers, and outdated technology hinder the efficient delivery of water services, making it difficult to provide consistent and reliable water to residents in Schulzendal. The logistical and technical challenges encountered by Nkomazi municipality in providing water services are not exclusive to Schulzendal Village. Such issues are common across many rural and remote areas in developing countries (McLuhan, 1964). The theory of Technological Determinism posits that technology plays a central role in shaping the effectiveness and efficiency of service delivery (McLuhan, 1964). In numerous low-income regions, outdated or inappropriate technologies, combined with insufficient maintenance, significantly hinder the delivery of

essential services like water. The World Bank (2010) has observed that many developing countries rely on aging water systems that are not only inefficient but also costly to maintain or replace.

In South Africa, these logistical and technological challenges are particularly visible within rural municipalities. Despite the Water Services Act of 1997 affirming the right of all citizens to access basic water services, several barriers persist. Aging infrastructure, poor routine maintenance, and a shortage of adequately trained personnel continue to undermine efforts to meet this mandate. The National Water Resource Strategy (NWRS) highlights the persistent struggle faced by rural service providers, many of whom lack the financial and technical capacity to upgrade or maintain existing systems (Department of Water and Sanitation, National Water Resource Strategy 2, 2013).

To better understand the systemic nature of these challenges, Institutional Theory offers a useful framework. It explains how limitations within institutional structures such as underfunding, insufficient technical expertise, and weak administrative capacity exacerbate service delivery failures, particularly in rural contexts (Human Sciences Research Council, 2013). These limitations often result in delays to crucial maintenance activities and a decline in overall service reliability. Moreover, rural municipalities in South Africa frequently suffer from a shortage of skilled professionals, many of whom are drawn to urban areas that offer better career prospects and working environments (Tissington, 2011). *“The absence of qualified technicians creates a continual backlog of maintenance and repair challenges” (Interview A).*

6.3.6 Slow bureaucratic processes within the municipality

Municipal officials identified bureaucracy as a major challenge to effective water service delivery in Schulzental village. *“The bureaucratic process is very slow and inefficient.” and “The paperwork and red tape make it hard to get anything done quickly.” (Interview C; Interview B).*

Slow bureaucratic processes in terms of the delivery of water to Schulzental village can be explained better through the Central Place Theory. The theory argues that if bureaucratic processes are slow and inefficient, it can delay the development of central places (towns or cities) and the delivery of services to rural areas. The theory further argues that central places should be able to provide services to smaller villages, but the incompetence in bureaucratic

processes can hinder central hubs from meeting the needs of rural populations. When the bureaucratic system is delayed, services like water may not reach remote areas on time, further exacerbating regional inequality.

In developing countries like India, water and sanitation delivery projects face significant delays due to bureaucratic incompetence at both the local and national government. For example, a report by the Water and Sanitation Program (WSP) in India revealed that while there are significant investments in water infrastructure, bureaucratic delays and a lack of coordination among governmental agencies often slow down the execution of water projects in rural areas. This causes significant gaps in service delivery, exacerbating regional inequalities between urban centres and rural communities. In some cases, rural areas that are far from central places may not receive sufficient water resources due to delays in bureaucratic approvals and inefficiencies in the project implementation process (WSP, 2010).

6.3.7 Corruption by municipal officials and politicians

Literature points out corruption as a significant restriction in service delivery which bring about sustainable development in rural areas because of the exploitation and stealing of funds for personal interest resulting in reduced effectiveness of community development initiatives (Van Schalkwyk, 2015). This is not different from what is happening in Schulzendal Village as municipal officials indicated that *"We've seen cases where funds disappear, and the projects never get completed."* (Interview A). Corruption within Nkomazi municipality significantly undermines water service delivery, leading to mismanagement of resources, unequal access to services, and compromised infrastructure, eventually affecting citizens' access to basic water.

The misallocation of funds in water projects, as stated by the Nkomazi Municipal officials, can also be interpreted through the perspective of public choice theory, where corruption is regarded as the result of individuals seeking personal advantages, often to the disadvantage of the public wellbeing (Buchanan & Tullock, 1962). Accordingly, the redirection of resources away from essential water projects in the village can be linked to the incentives encountered by those in the system, who may prioritize their own interests over the needs of the community.

6.3.8 Dilapidated water infrastructure in Schulzendal village

A total of 61.5% of respondents agreed that the water infrastructure in Schulzendal village is dilapidated, making it a challenge for the municipality to deliver water services in the village.

The issue of dilapidated infrastructure is a typical South African problem, particularly in rural areas. South Africa has struggled with water infrastructure for many years due to several factors, including the historical legacy of apartheid, urban growth, increasing population, and climate change (Human Sciences Research Council, 2013). In the post-apartheid era, many rural areas, including Schulzendal, continue to struggle with poorly maintained water infrastructure, poor service delivery, and disparities in access to water resources.

This is not different to what is happening in other countries. A report by WaterAid India (2020) argued that the country struggles with dilapidated water infrastructure, particularly in rural villages. The report further argued that poor infrastructure and maintenance of water systems contribute to the challenges of providing clean water to rural communities (WaterAid India, 2020). As observed in Schulzendal, rural areas in India also rely on local government for water service delivery, however the water infrastructure is often disregarded, causing challenges in water access.

The challenge of dilapidated water infrastructure can also be understood through the lens of the Principal-Agent theory. In the context of Schulzendal village, the municipality is the Principal and is responsible for ensuring that water services are provided to the village and that the water infrastructure is properly maintained. Yet, the agents (municipal employees, contractors) are responsible for carrying out these tasks. However, these agents may not have the capacity to maintain and upgrade the water infrastructure within the village. This is a typical example of a principal-agent challenge.

The pictures below illustrate the dilapidated water infrastructure observed in Schulzendal village, highlighting the poor condition of the existing water pipes. The pipes shown are old, and broken, and severely hindering the effective transportation of water to households. These old pipes create a challenge for the municipality, as they lead to water leakage, water scarcity, and the failure to meet the community's water needs.



Plate 6.1: Dilapidated Water Infrastructure

Source: Author (2024)

6.3.9 Illegal Immigration to communities

Municipal officials argue that Schulzendal and other communities within the Nkomazi Local Municipality have experienced rapid growth, largely driven by the rise of informal settlements. These unplanned developments have spread widely throughout the municipality, placing significant pressure on already stretched municipal resources. The increasing number of residents, including undocumented immigrants primarily from neighbouring countries such as Swaziland and Mozambique, has further strained the municipality's budget. In response to the growing demand for essential services particularly access to water, the municipality is left with no choice but to divert funds away from other developmental projects.

The settlement of undocumented migrants has also contributed to a surge in unlawful land occupation, resulting in the emergence and expansion of informal villages across the Nkomazi sub-region. This trend has complicated municipal efforts to plan effectively for infrastructure and household water service delivery, as the expansion often occurs outside official frameworks or development plans (NKLM IDP 2020/2021). Similar challenges have been noted in other developing regions, where informal urban growth and cross-border migration have disrupted local planning processes and weakened water service delivery systems (UN-Habitat, 2016).

6.3.10 Land tenure systems challenges

Local Municipalities are mandated through the Municipal System Act 32 of 2000 to provide water services to areas within their jurisdiction. Yet, that remains a challenge in Schulzendal village. Findings from the traditional leaders and the municipal officials indicate that land tenure is a challenge faced by the municipality in the delivery of water services to Schulzendal village. The municipality is predominantly rural and faces several challenges regarding land ownership, and *“most of the land is still under the custodian of traditional leaders, making it difficult to provide water to the village because there is no enforcement of land use controls given that the land uses are not planned for”* (Interview A).

A study by Maharaj (2010) also indicated that most municipalities in Limpopo Province, South Africa, struggle to provide water services to rural areas owing to the dominance of traditional councils in land administration. Most ‘traditional leaders do not align with municipal objectives, which makes a challenge for municipalities to administer land-use regulations and improve water services (Maharaj, 2010).

Likewise, in Sub-Saharan Africa, land tenure has been observed as a challenge hindering water service delivery in rural and peri-urban areas. A study by Alemu (2016) revealed that insecure land tenure contributes to inadequate water service delivery, especially when traditional leaders have control over land. Most of these traditional leaders are adamant to collaborate with local government in providing service delivery. Without legal land rights, it becomes difficult for local governments to “implement planning or enforce regulations that are necessary to improve infrastructure and services, including water supply” (Alemu, 2016).

6.3.11 Fraud within the municipality

Fraud within the municipality is also among the challenges that were identified by participants. Municipal officials indicated that municipality has been implicated in fraudulent activities before that hindered household water service delivery in Schulzendal village and other rural areas that faced water shortages.

The Covid-19 Municipal Relief Funding Report by the Auditor-General supports these findings as Nkomazi Local Municipality was flagged as one of the 12 municipalities most vulnerable to potential fraud during the pandemic. Notably, it ranked among the top four nationally for excessive spending on water tanker services in 2020. The report highlighted that the

municipality had contracted companies to deliver water to rural communities facing shortages. However, these contractors billed the municipality inflated amounts for both the use of tankers and the transport of water. One of the most concerning issues raised was that a uniform rate was applied across all tankers, regardless of their size, capacity, or the distance they travelled, leading to unjustified and excessive payments.

6.3.12 Political interference in municipal administration

Findings revealed that Nkomazi Local Municipality has become increasingly entangled in political affairs, blurring the lines between elected officials and administrative staff. There is a growing trend of cadre deployment and nepotism, which has deeply compromised the independence of the municipality's human resources department. As "the ANC holds a strong majority in the municipal council and has taken over the recruitment and employment processes" (Interview A), disregarding established hiring protocols.

The majority of the respondents also indicated that this political interference has led to the "appointment of individuals lacking the necessary qualifications". The prioritization of cadre deployment over service delivery has become a concerning norm within the municipality, hindering the delivery of water services to areas within its jurisdiction. The appointment of unqualified or politically connected individuals to key administrative and technical positions, undermines the municipality's capacity to plan, manage, and maintain essential infrastructure.

This results in poor planning, delayed maintenance of water infrastructure, and a lack of accountability when problems arise. Skilled professionals who might otherwise address issues such as broken pipes, malfunctioning pump stations, or mismanaged water budgets are often overlooked in favour of politically connected individuals who may lack the necessary technical knowledge.

Shongwe & Meyer (2023) argue that in October 2020, residents from Nkomazi gathered in protest at the municipality's headquarters in Malelane, voicing frustration over nepotism and cadre deployment of more than 200 people. Despite these allegations, municipal spokesperson Cyril Ripinga defended the appointments, stating that the positions had been advertised in 2019, but the hiring process was postponed due to the Covid-19 pandemic and subsequent lockdowns (Mpumalanga News, 2020). These appointments ensured that even individuals who did not qualify were selected for managerial and strategic positions simply because they were loyal members of the ANC.

Zimbabwe has also seen the politicisation of municipal appointments and widespread patronage significantly weaken local governments' capacity to deliver basic services, including water. As reported by Chigwata (2016), political interference led to a collapse in infrastructure development and maintenance, leaving many urban and rural areas without access to safe water. Similarly, in Kenya, devolution efforts aimed at improving service delivery were often undermined by political appointments and favoritism, leading to inefficiencies in the provision of public utilities, including water (Mwangi, 2018).

6.3.13 Lack of community engagement to decision making processes

One of the functions of municipalities is to include communities in municipal matters as determined by Section 152 of the constitution. One of the challenges to effective household water service delivery in Schulzendal village as identified by respondents, is the lack of meaningful community engagement. Respondents indicated that development projects are often planned and implemented without active consultation with residents, resulting in a disconnect between what the municipality provides and what the community needs.

In contrast to the Schulzendal village case, the Makwane Village case in the Free State has witnessed the effectiveness of community engagement in decision making processes. When residents were engaged in the planning and management of water and sanitation services, outcomes significantly improved. The South African Human Rights Commission (SAHRC, 2014) reported higher levels of infrastructure sustainability and community satisfaction when local voices shaped decisions. The village's experience aligns with participatory theory, which holds that citizen empowerment leads to a stronger sense of ownership and responsibility toward public resources.

6.3.14 Lack of community-managed water committees

The researcher observed that there is a lack of community-managed water committees within the village. These committees are often established to oversee the day-to-day management of water points, maintenance of infrastructure, and communication between communities and municipal authorities. Community members indicated that they are not informed or trained which hampers their ability to manage water systems efficiently. Moreover, there are disputes over leadership roles, unclear responsibilities regarding community committees.

In the South African context, research has shown that while community-based management of water services has been encouraged, its success varies significantly depending on the level of municipal engagement. According to a report by the Water Research Commission (2013), many community water committees across the country are dysfunctional due to inadequate training, politicization, and a lack of formalized roles and responsibilities. The Department of Water and Sanitation (2018) also noted that community structures are often left unsupported, resulting in poor infrastructure maintenance and service delivery backlogs, especially in deeply rural municipalities like Nkomazi.

Internationally, similar issues have been observed in Tanzania, where the Village Water Committees faced significant operational challenges due to poor training and minimal institutional support. As reported by Jiménez and Pérez-Foguet (2010), the committees frequently struggled with maintenance, financial management, and accountability, resulting in non-functional water schemes in several rural areas.

6.4 Chapter summary

This chapter explored the various challenges faced by the Nkomazi Local in the delivery of household water services to the community of Schulzental Village. The chapter also examined several theoretical frameworks, including Central Place Theory and Principal-Agent Theory, to better understand the underlying issues. Additionally, it reviewed existing literature on similar challenges experienced by municipalities in other international contexts. The following chapter will shift focus to spatial planning strategies for improving household water service delivery in Schulzental Village of the Nkomazi Local Municipality.

CHAPTER 7: SPATIAL PLANNING STRATEGIES FOR IMPROVING HOUSEHOLD WATER SERVICE DELIVERY IN SCHULZENDAL VILLAGE OF NKOMAZI LOCAL MUNICIPALITY

7.1 Introduction

This chapter presents a comprehensive analysis and detailed presentation of the data collected regarding objective 3: to propose spatial planning strategies for improving household water service delivery in Schulzental Village of Nkomazi Local Municipality. The chapter begins by addressing the methodological note, followed by the spatial planning strategies as well as the chapter summary.

7.2 Methodological note

The information presented in this chapter was gathered using both primary and secondary sources. Primary data collection methods included questionnaires, interviews with key informants, and direct observations, with the intention to gain insights on the spatial planning strategies that can be proposed for improving household water service delivery in Schulzental village of Nkomazi Local Municipality.

In addition, secondary data was obtained from a variety of publicly available documents, such as newspapers, academic books, journal articles, and official municipal records, including the Nkomazi Local Municipality's Integrated Development Plans (IDPs).

7.3 Spatial Planning strategies for improving household water service delivery in Schulzental Village

This section outlines the key spatial planning strategies for improving water service delivery in Schulzental village of Nkomazi local municipality as tabled below:

Table 7.1: Tabling of Planning Strategies
Source: Author (2025)

Short Term Strategies
Community Involvement in planning and decision making
Liaising with other spheres of government to intervene

Medium Term Strategies
Strategic Infrastructure Development
Prioritize water management in urban planning
Effective human resource management within the municipality
Long Term Strategies
Address land tenure systems issues
Outsourcing water services and partnering with the private sector
Corruption control and improved municipal accountability

The planning strategies can be further broken down in terms of how they can be applicable or carried out as follows:

7.3.1 Short Term Strategies

The short-term spatial planning strategies for improving household water service delivery in Schulzendal Village of Nkomazi Local Municipality are as follows:

7.3.1.1 Community Involvement in planning and decision making

Community involvement and feedback refer to the active participation of residents in the planning and management of household water services. The study found that community involvement into decision-making processes can serve as a powerful spatial planning strategy to improve the ongoing challenges in water service delivery. Participants indicated that “*The community needs to be more involved in the decision-making process*” and “*We should have regular meetings with the residents to hear their concerns and suggestions.*” (Interview D & A). Respondents further emphasized that “*Community feedback is crucial for identifying the real issues and finding solutions.*” (Interview B). By allowing residents to participate in identifying local needs, voicing concerns, and contributing to planning decisions, the municipality can ensure that water infrastructure projects are better aligned with actual community priorities and spatial realities.

This community involvement approach can be explained through the Principal-Agent Theory of Planning, which views the planner (or municipality) as an "agent" acting on behalf of the "principal", in this case, Schulzendal village is the principal. When the resident's voice is excluded from the planning process, a disconnect emerges, often resulting in ineffective household water service delivery and infrastructure that fails to meet local demand. In Schulzendal, where water scarcity, system failures, and maintenance issues persist, this misalignment is evident.

Meaningful community participation reduces this information gap, allowing the "agent" to act in the best interest of the "principal." Moreover, such collaboration helps to create shared ownership over resources, increasing accountability and improving infrastructure upkeep over time. Therefore, including participatory decision-making into spatial planning is not only a democratic obligation but a practical solution for achieving more sustainable and efficient household water service delivery in rural areas like Schulzendal.

A relevant South African case study advocating the importance of community involvement is that of Makwane Village in the Free State, where the South African Human Rights Commission (2014) found that involving the community in sanitation and water projects led to improved maintenance, better user satisfaction, and stronger health outcomes. Residents participated in the design and oversight of facilities, reinforcing the idea that planning success hinges on community ownership.

Equally, in Nepal, the Community-Based Water Supply and Sanitation Programme empowered rural user groups to plan and manage their water infrastructure. The World Bank (2013) reported that these community-managed systems outdid centrally managed ones in terms of reliability and local support, showcasing the global relevance of aligning spatial planning with grassroots input. Both cases affirm that when the "principal" is empowered to guide the "agent," service delivery becomes more equitable, efficient, and sustainable.

7.3.1.2 Liaising with other spheres of government to intervene

Municipal officials indicated that there are no proper relations with other government spheres in terms of water service delivery hence the municipality faces significant challenges in providing consistent water services to Schulzendal village and its other rural areas. To address this, the municipality can liaise with other government spheres and benefit from the technical,

financial, and institutional support from higher levels of government, mostly the Department of Water and Sanitation (DWS) and the Mpumalanga COGTA.

By aligning municipal Integrated Development Plans (IDPs) with the National Water and Sanitation Master Plan can ensure that Nkomazi's local strategies are reinforced by national priorities and funding allocations (Department of Water and Sanitation, 2019). Furthermore, intergovernmental forums such as the District Intergovernmental Relations Forum (IGR) offer platforms where municipalities like Nkomazi can raise concerns, share data, and coordinate infrastructure rollouts with both the Ehlanzeni District Municipality and relevant provincial departments (South African Government, 2020).

Effective liaison with national programs such as the Municipal Infrastructure Grant (MIG) and the Water Services Infrastructure Grant (WSIG) can also enable Nkomazi to address backlogs and upgrade rural water infrastructure to improve water service delivery in Schulzental village. Collaborative governance, when structured properly, can help bridge service gaps, reduce duplication of efforts, and improve the sustainability of rural water provision (Van der Walddt, 2014).

From the Public Goods Theory perspective, rural household water services characterize a “classic public good characterized by non-excludability and non-rivalry” (Van der Walddt, 2014). Rural areas lack financial resources to procure water infrastructure on their own, making government intervention necessary. Therefore, it is important for the local municipality to work together with other government spheres in order to enable the provision of household water as it cannot implement provision on its own due to financial constraints (Musgrave & Musgrave, 1989).

7.3.2 Medium Term Strategies

The medium-term spatial planning strategies for improving household water service delivery in Schulzental Village of Nkomazi Local Municipality are as follows:

7.3.2.1 Strategic Infrastructure Development

Strategic infrastructure development involves the careful planning and execution of projects aimed at improving the physical structures and systems that deliver water. Respondents highlighted the critical role that strategic planning plays in improving water service delivery

through spatial planning. As expressed in Interview D, “*We need both short-term and long-term plans to address the water issues,*” the emphasis lies in adopting an approach that tackles immediate water shortages while also investing in infrastructure and systems that can sustainably meet future demand.

Similarly, Interview A emphasise this view, stating, “*Strategic planning is crucial for effective infrastructure development.*” These statements align with the principles outlined in South Africa’s National Water and Sanitation Master Plan (DWS, 2018), which emphasizes the need for integrated, long-term planning frameworks to ensure water security across urban and rural landscapes.

In rural areas like Schulzendal, where service backlogs and infrastructure limitations are common, strategic spatial planning can guide where and how resources are allocated, ensuring equitable access across the landscape. Through tools such as Geographic Information Systems (GIS), planners can map water scarcity hotspots, plan future pipeline extensions, and prioritize high-need areas. Ultimately, aligning short- and long-term spatial planning strategies with community insights ensures that water infrastructure development is not only technically sound but socially responsive and geographically targeted.

7.3.2.2 Prioritize water management in urban planning

Urban planning focuses mostly on population management, infrastructure development, as well as service delivery in areas within municipal administration. However, rural areas in Nkomazi municipality have witnessed challenges in household water service delivery due to urban-centred water management decisions that overlook the needs of rural areas. By prioritizing water management in urban planning processes, there is potential to significantly improve water service delivery in these rural communities.

Municipal officials indicated that urban and rural areas of Nkomazi municipality share water sources such as rivers and dams. Over-extraction or contamination of these shared water resources in urban areas has led to water shortage and or water pollution in rural areas. Prioritizing water management practices in urban planning like pollution control and efficient water use has the potential to enhance household water provision in Schulzendal village and other rural areas.

Water management in urban planning has been used as a spatial planning strategy to progress household water service provision and delivery by the City of Cape Town. The City's water strategy includes regional partnership with nearby rural municipalities to control shared water sources like dams and rivers from the Western Cape Water Supply System. This method aids rural areas in securing more predictable water allocations, especially during droughts (Department of Water and Sanitation, 2019).

Equally, Vietnam urban planners have implemented a coordinated urban-rural planning model, that allows urban water infrastructure to also supply water to neighbouring rural areas through regional trunk lines. This model not only reduces costs but also improves equal access to household water service delivery by both urban and rural areas (Asian Development Bank, 2013).

The Central Place Theory, initially proposed by Christaller (1933), suggests that urban centres are primary locations or central places for providing goods and services to rural areas. However, urban planning often overlooks this balance, leading to service delivery gaps in rural areas. For instance, rural areas such as Schulzental village in Nkomazi Municipality struggle with household water services owing to decisions that prioritize urban needs. By aligning water management strategies with the spatial insights offered by Central Place Theory, planners can promote more balanced service provision, ensuring that rural areas are not left behind and are adequately supported within the broader planning framework (Christaller, 1933).

7.3.2.3 Effective human resource management within the municipality

Human Resource Management (HRM) is described as the management of work and people to attain desired outcomes. Participants indicated that effective human resource management and development can help improve water service delivery in Schulzental village as stated by Interview C when he cited that *“we need a sound human resource management within the municipality”*. Cloete, et al. (2016) also argues that effective human resource management can improve a municipality's organisational performance and ensure that the municipality delivers quality water services to its communities in a sustainable manner.

Adank et al., (2012) points that effective HRM as a spatial planning strategy for improving service delivery plays an important role by ensuring that municipal human resources align with spatial development goals. This includes the recruitment and training of individuals with the

capacity to manage water resources as well as maintain rural water infrastructure (Adank, et al., 2012).

The municipality needs to prioritize the hiring of skilled and competent individuals and do away with political deployment to maintain professionalism in municipal administration, leading to the effective delivery of household water services to Schulzendal village. Shongwe and Meyer (2023) also argue that municipal appointment practices should be done in a manner that advocates for transparency, and all processes should align with municipal employment standards.

In countries like Uganda, municipal household water service delivery emphasized the important role played by human resources in the maintenance of rural water infrastructure. A lack of qualified human resources led to challenges in household water provision and the local government had to form partnerships that introduced “targeted HRM strategies, including training for local water officers and technicians, and deployed them based on spatial needs identified through GIS mapping” (Mugumya & Kayaga, 2011). These strategies improved rural household water service delivery tremendously.

From the perspective of Public Goods Theory, household water services is a basic service that every human being must have access to regardless of their location or socioeconomic status. However, the effective and sustainable delivery of such key services lies largely on the performance of municipal officials. Therefore, it is important that the Agent (municipality) ensure effective HRM to improve water household services delivered to the principal (Schulzendal village).

7.3.3 Long Term Strategies

The long-term spatial planning strategies for improving household water service delivery in Schulzendal Village of Nkomazi Local Municipality are as follows:

7.3.3.1 Address land tenure systems issues

The municipal officials indicated that it is their responsibility to deliver water in communities inside their jurisdiction as mandated by the White Paper on Local Government (1998). In order to fulfil their constitutional duties, the land tenure patterns of Schulzendal village need to be addressed from customary to state land ownership.

Customary land tenure refers to traditional systems of land rights and governance practiced by indigenous and local communities. Under customary tenure, land is typically held communally by traditional leaders, such as chiefs and kings, who allocate land based on community norms and lineage (Claassens & Cousins, 2008). While recognized by the South African Constitution and the Traditional Leadership and Governance Framework Act (2003), customary law often lacks formal documentation or registration, which often complicates rural development and service delivery planning.

In contrast, state land ownership involves land that is owned, registered, and administered by the government. Under this system, the state holds legal title to the land and can allocate it for public purposes, such as infrastructure development or service delivery. This form of tenure provides clearer legal certainty, which can facilitate investments in water infrastructure, housing, roads, and sanitation in rural areas (Department of Rural Development and Land Reform, 2013).

According to Times Reporter (2009), Rwanda saw significant changes in terms of development and service delivery after 2009 following a national program that was aimed at addressing land reforms and redistribution programmes. This programme shifted land tenure systems from customary land tenure which was characterised by unclear land rights and tenure insecurity to state land ownership. President Paul Kagame acknowledged Rwanda Eastern Province residents for working with the government in the promotion of land reforms and redistribution programmes which yielded positive results by contributing to the province's development and the delivery of basic services including water.

Addressing these land tenure issues in Schulzendal village is necessary to enable the municipality to perform their constitutional mandate of household water service delivery. Without formal land rights or secure tenure, it is difficult for Nkomazi Local municipality to invest in service provision.

7.3.3.2 Outsourcing water services and partnering with the private sector

Participants reported that outsourcing services and partnering with the private sector could be one of the spatial planning strategies for improving water service delivery in Schulzendal village. These partnerships have the potential to address challenges such as limited water infrastructure, financial constraints and poor governance.

Prevost, et al. (2010) argued that in 2004, a field review by World Bank revealed that more than half of the piped rural water supply systems in Rwanda were malfunctioning because of poor management. Rwandan government moved to a public-private partnership (PPP) management model. In 2010, 235 rural water supply systems, which was 28% of the 847 water supply systems in Rwanda were managed under PPPs serving 1 million people.

A study by WaterAid Tanzania revealed that Sangara village in Tanzania saw massive improvements in household water service delivery when WaterAid Tanzania partnered with Habitat for Humanity, eWATERpay LTD, Babati District Council and Unit Trust of Tanzania Microfinance Institution (UTT-MFI), to implement a water project to enhance access to clean water, through piloting an alternative financing model, working in collaboration with the private sector (Sippy & Williams, 2019). The project revealed that if communities comprehend and are included in the water service delivery planning process, they are willing to pay for sustainable water services.

7.3.3.3 Corruption control and improved municipal accountability

Respondents pointed out that addressing corruption and improving accountability within Nkomazi municipality is crucial for improving water service delivery to Schulzendal village and other rural areas within the municipality. To effectively tackle corruption and maladministration within the municipality, strict implementation of the Prevention and Combating of Corrupt Activities Act 12 of 2004 and the Municipal Finance Management Act 56 of 2003 is important. Officials found to be involved in corrupt practices should be reported to the court of law to avoid reoccurrence. It is important that the municipality adopts a firm stance against corruption, ensuring that officials are consistently held accountable for any misconduct.

Journalists in Lima, South America exposed corrupt contractors who were tasked with supplying household water through water tankers but contributed to extensive theft and resale of the free water meant for poor households in rural areas. In order to control this corruption and improve water service delivery, local authorities implemented strict contractor vetting, GPS tracking of trucks, and introduced hotline reporting systems (Wagner & Vita, 2021).

7.4 Chapter Summary

This chapter presented spatial planning strategies for improving household water service delivery in Schulzendal village of Nkomazi Local Municipality. Several key approaches were highlighted, including the active community engagement in planning and decision-making processes, the development of strategic infrastructure, and the integration of water management priorities into urban planning frameworks.

In addition, the chapter emphasized the importance of effective human resource management within municipal structures, fostering collaboration with other spheres of government, and addressing challenges related to land tenure. Other recommended strategies included outsourcing water services and forming partnerships with private sector and enforcing corruption control and accountability mechanisms.

The chapter also examined the relevance of various theoretical frameworks, including Central Place Theory and Principal-Agent Theory, to better understand the strategies proposed. Additionally, it reviewed existing literature on similar spatial planning strategies implemented by municipalities in South Africa and other countries. The following chapter will focus on the research conclusions and recommendations.

CHAPTER 8: SUMMARY, CONCLUSION, AND RECOMMENDATIONS

8.1 Introduction

This chapter provides conclusions and recommendations of the research findings drawn from chapter five, six and seven. The chapter entails a conclusion of the key findings concerning specific research questions which relates to the condition of household water service delivery in Schulzendal village, the challenges faced by Nkomazi Local municipality in the delivery of household water to Schulzendal village as well as the spatial planning strategies for improving household water service delivery in Schulzendal village of Nkomazi Local municipality. The chapter also provides short and long-term recommendations, areas for further research and the chapter summary.

8.2 Summary of findings

This chapter explored spatial planning strategies for improving household water service delivery in Schulzendal village of Nkomazi Local municipality. The study ascertained the condition of household water service delivery in Schulzendal Village of Nkomazi Local Municipality, analysed the challenges faced by Nkomazi Local Municipality in the delivery of household water services to Schulzendal Village and proposed spatial planning strategies to address these issues.

The research was grounded in three theoretical frameworks: the Public Goods Theory, Central Place Theory, and Principal-Agent Theory. Both qualitative and quantitative research design was adopted, integrating both qualitative and quantitative approaches to gain a comprehensive understanding of the situation.

Participants were selected using a combination of convenience, snowball, and purposive sampling techniques. Data collection included key informant interviews, household questionnaires, and participatory observation. The collected data were examined using thematic network analysis for qualitative insights, along with descriptive and inferential statistical methods for quantitative data.

8.3 Conclusion on the research findings

Based on the key findings in relation to specific research objectives, the following conclusions were made:

8.3.1 The condition of household water service delivery in Schulzendal Village

The intention of the first objective of the study was to ascertain the condition of water service delivery in Schulzendal village of Nkomazi Local Municipality. Through a triangulated research methodology that included questionnaires, key informant interviews, and direct observations, the study was able to paint a picture of the daily struggles residents face in meeting their basic water needs.

One of the main findings was that water service delivery in the village is highly uneven, with residents relying on a variety of sources including communal taps, standpipes, a community borehole, water tankers, the nearby dam, and privately purchased water. However, none of these sources are sufficient on their own to meet the needs of all households, leading to a situation where residents must frequently alternate between sources based on availability and reliability. This lack of a consistent and dependable water supply contributes to widespread water insecurity in the area.

The physical accessibility of water is also a significant challenge. The study found that the majority of residents are forced to travel distances exceeding 200 meters to collect water, particularly from communal taps and the borehole. Only a small proportion of the population has access to water sources within 100 meters of their homes. This not only consumes a substantial amount of time and energy, particularly for women and children who are traditionally tasked with water collection but also limits the amount of water households can realistically carry and use on a daily basis.

The findings also revealed that many of the existing water infrastructure including storage tanks, standpipes, and boreholes are either non-functional, poorly maintained, or completely broken. Participants frequently reported that the infrastructure was insufficient to meet the community's demand, resulting in overcrowding at functional water points and, at times, conflict among users.

Water quality emerged as another major concern. Respondents noted that the water from several sources, especially the dam and some communal taps, is often contaminated. Descriptions included pungent smells, discoloration, and visible debris, all of which are indicators of poor water quality.

Moreover, the decentralized nature of water distribution in Schulzendal exacerbates existing inequalities. Households located closer to communal facilities have relatively easier access, while those on the periphery face much greater hardship. The absence of a centralized and coordinated water distribution system results in inefficiencies, increased physical burden on residents, and inconsistent access that does not align with the principles of equitable service delivery.

In light of these findings, it is evident that water service delivery in Schulzendal Village is not only inadequate but also unsustainable in its current form. The situation demands urgent attention from municipal authorities and other relevant stakeholders. Addressing this issue will require a holistic approach that includes the repair and upgrading of existing infrastructure and the development of a centralized water distribution network. Without such interventions, residents will continue to face daily challenges that compromise their health, dignity, and overall quality of life.

8.3.2 The challenges faced by Nkomazi Local Municipality in the delivery of household water services to Schulzendal Village

The intention of the second objective was to determine the challenges faced by Nkomazi Local Municipality in the delivery of household water services to Schulzendal Village. Data was collected through a combination of primary methods such as questionnaires, interviews with key informants, and direct field observations. While secondary sources, included municipal records and academic literature.

One of the most pressing issues the study revealed is limited municipal funding, which severely restricts the maintenance of vital water infrastructure. This financial shortfall is compounded by low revenue collection due to residents' non-payment for municipal services, further straining the municipality's capacity to improve water delivery systems. The increasing demand for water, influenced by the growth of population and exacerbated by the effects of

climate change has also placed additional pressure on already strained resources, making it even harder to meet the needs of the community.

Operational challenges are another major barrier to progress. The municipality faces operational setbacks, such as technical difficulties, logistical challenges, and slow bureaucratic procedures, all of which delay the implementation of vital water services. Moreover, the situation is worsened by internal governance challenges, including widespread political interference, allegations of corruption and fraud within the municipality, and aging or deteriorating infrastructure specific to Schulzendal Village. These governance issues not only undermine service delivery but also contribute to a lack of accountability and transparency in the management of water resources.

In addition to these technical and financial challenges, there are significant social and administrative issues that further complicate the situation. Complex land tenure arrangements and the lack of meaningful community participation in local decision-making have created barriers to effective planning and implementation of water services. Furthermore, the absence of community-led water management structures has meant that water management decisions are often disconnected from the needs and realities of the local population, making it harder to develop sustainable solutions.

The findings also highlighted the impact of illegal immigration, which has contributed to increased service demand and planning limitations. This phenomenon has made it difficult for the municipality to accurately forecast and address the water needs of both legal residents and migrants, placing additional strain on an already overburdened system.

A combination of financial, operational, governance, and social issues has created a complex environment that hampers effective service delivery. Addressing these challenges will require a comprehensive approach that includes improved funding mechanisms, enhanced community engagement, and better management of resources.

8.3.3 Spatial planning strategies for improving household water service delivery in Schulzendal Village of Nkomazi Local Municipality.

The third objective of this study focused on proposing spatial planning strategies to improve household water service delivery in Schulzendal Village, Nkomazi Local Municipality. Data was gathered through a mix of primary methods, questionnaires, interviews with key

informants, and field observations as well as secondary sources, including municipal records and academic literature. The proposed strategies aim to tackle the challenges identified by the research and enhance water service provision in the area.

Several key strategies emerged as critical to improving water service delivery. First, the active involvement of local communities in planning and decision-making processes is essential to ensure that water service solutions reflect the needs of residents. Additionally, the development of strategic infrastructure is vital for improving water service capacity, supported by the integration of water management priorities into urban planning frameworks to ensure water needs are considered in broader municipal development plans (Christaller, 1933).

The study also highlighted the importance of effective human resource management within municipal structures, ensuring that staff are adequately trained and resourced to implement these strategies. Another key strategy is fostering collaboration with other spheres of government, which can provide additional support and resources (Department of Water and Sanitation, 2019). Addressing land tenure challenges is also critical, as secure land rights are necessary for the successful implementation of water infrastructure projects.

Further strategies include outsourcing water services to specialized entities for more efficient delivery, as well as forming partnerships with the private sector to oversee additional resources, expertise, and innovative solutions. Lastly, the study emphasized the importance of enforcing corruption control and accountability mechanisms to ensure proper resource management and municipal accountability. These strategies, when implemented effectively, will improve household water service delivery in Schulzendal Village

8.4 Study Recommendations

This section presents the recommendations proposed by the study.

8.4.1 Short-Term Strategies

The study recommends the following short-term strategies:

Upgrade Existing Water Infrastructure

Findings from the study indicate that Schulzendal Village's water infrastructure is in a poor and deteriorating state, requiring urgent maintenance and upgrades. Improvements should be made in a manner that ensures sufficient and consistent household water service delivery.

Deploy Town Planners to Rural Areas

To improve planning and coordination, it is recommended that qualified town planners be deployed to rural communities. These professionals should work alongside traditional leadership, supporting the planning and management of household water service delivery projects. Ideally, the town planner should come from the same rural community to ensure a deeper understanding and genuine commitment to addressing local service needs. Acting as project managers, they would serve as a liaison between the community, traditional leaders, and local government, attending municipal meetings and sharing relevant updates with all stakeholders.

Educate Traditional Leaders About Planning

Several participants in the study expressed concern that traditional leaders often prioritize land preservation without fully considering the impact of uncoordinated land use on service delivery. As such, traditional leaders should receive targeted education on spatial and land use planning to enhance their understanding of how effective planning can benefit their communities, especially in terms of service provision like water infrastructure.

8.4.2 Long-Term Strategies

The study recommends the following long-term strategies.

Local Government as the Primary Water Service Provider

The study's respondents highlighted a desire for land tenure reform in Schulzendal Village from customary to state ownership. This shift would enable local government to assume greater responsibility and authority in providing household water services, aligning service delivery with state-supported infrastructure development.

Policy revisions

It is recommended that certain national policies, particularly those predating the democratic era, be reviewed and updated. As the closest sphere of governance to the people, local government should be empowered to manage land and deliver essential services, including water. The Municipal Systems Act 32 of 2000 outlines the responsibilities of local authorities and should be reinforced to clearly define the state's role through national and local government in land governance and service delivery.

Secure Government Financial Support

A recurring theme in the study was the lack of adequate funding for household water services. It is therefore advised that government, particularly through its Department of Water and Sanitation, allocate dedicated financial resources to support infrastructure development and service delivery in Schulzendal Village. Prioritizing household water provision in local government budgets is essential to meeting basic needs and ensuring long-term sustainability.

8.5 Areas for further research

Globally, ensuring access to clean water and proper sanitation is crucial for advancing both public health and overall development (World Health Organization, 2022). However, according to the initial data released for the Sustainable Development Goals (SDGs), in 2015, approximately 844 million individuals lacked access to basic water services, and around 2.1 billion were without safely managed drinking water—most of whom resided in rural communities. In addition, poor sanitation and polluted water sources are linked to the daily deaths of roughly 1,600 children from related illnesses (World Vision, 2014). To improve household water service delivery in rural areas, further research needs to be conducted in the following areas:

- Service delivery challenges facing rural municipalities.
- The integration of water management priorities into urban planning frameworks.
- The impacts of land tenure reform in the delivery of household water to rural communities.
- Strategies for corruption control and improved accountability to improve municipal service delivery.
- Role of traditional leadership in spatial planning.

- Sustainability of public-private partnerships in rural water provision.

8.6 Contribution to Knowledge

The current knowledge gap within the study filed of this research lies within the focus on the consequences rather than the main cause of the problem, this is because the underlying issues are not easily discernible and requires an insight understanding of planning and how it is applicable within a South African context especially in rural and marginalised areas.

The contribution to knowledge that this study made highlighted the land tenure system as the main cause of water service delivery challenges. This is due to the fact that even though municipal planning has been constitutionally mandated, it is very difficult for municipalities to facilitate service delivery in areas outside its planning area. This means that for a municipality to render services to a certain area, the area should first be proclaimed or transferred of ownership to the municipality, the municipality can then render services to such areas and then make it accessible to the public through processes such as township establishments that will officially declare such area as a municipal planning area.

But the reality of the situation that this study has uncovered was that the land in most rural and marginalised areas still belongs to the National Government and is under the custodianship of traditional leaders. As a result, there is a need of donation of such land to municipalities for an effective service delivery process. Currently municipalities rely on Co-operative government measures between Traditional Leaders, CoGHSTA and the National Government through its various spheres such as DWA to facilitate service delivery. Such an approach is lengthy and results in aging and unmaintained water service delivery infrastructure leading to water scarcity challenges as highlighted in this study.

8.7 Hypothesis Testing.

Although it is primarily used in Quantitative Research, Hypothesis Testing in Qualitative Research helps to gain in-depth understanding, exploration of complex phenomena and generation of new insights and theories rather than statistical verification of predetermined hypotheses (Karhulahti, 2025). In this manner a process of exploratory hypothesis generation and refinement or testing emerging patterns within the data can be engaged. As recommended by Karhulahti (2025) this study's hypothesis testing procedure was in the following manner:

8.7.1 Research Questions and Tentative Expectations (Non-Formal Hypothesis)

Research Question 1: What is the condition of household water service delivery in Schulzendal Village of Nkomazi Local Municipality?

Non-Formal Hypothesis: Schulzendal Village of Nkomazi Local Municipality is characterised by poor status of household water service delivery in terms of water availability, access, and quality.

Research Question 2: What are the challenges faced by Nkomazi Local Municipality in the delivery of household water services to Schulzendal Village?

Non-Formal Hypothesis: Nkomazi Local Municipality faces various challenges in delivering water services to Schulzendal Village households including aging/damaged infrastructure as well as financial challenges.

Research Question 3: What spatial planning strategies can be proposed for household improving water service delivery in Schulzendal Village of Nkomazi Local Municipality?

Non-Formal Hypothesis: Only spatial planning strategies tailored to solve water service delivery challenges in rural/marginalised areas can be proposed for improving household water service delivery in Schulzendal Village.

8.7.2 Data Collection and Exploration

This study has sufficiently employed and collected various data collection method including in-depth interviews, observations, as well as questionnaires.

The focus was on collection rich, detailed information and exploring diverse perspectives related to each research question. This was further augmented by data analysis and presentation respective to each research objective throughout Chapter 4 to chapter 7.

8.7.3 Identifying Patterns and Developing Emergent Hypotheses

Research Question 1: What is the condition of household water service delivery in Schulzendal Village of Nkomazi Local Municipality?

Emergent Hypothesis: The condition of water infrastructure in Schulzendal Village is significantly poor and inadequate, they are either broken, insufficient, or nonfunctional, the community relies mostly on communal taps which are located far, and/or unsafe water sources such as dams and rivers/fountains.

Research Question 2: What are the challenges faced by Nkomazi Local Municipality in the provision of household water services to Schulzendal Village?

Emergent Hypothesis: The major challenge experienced by Nkomazi Local Municipality when it comes to water service provision to Schulzendal Village is the damaged/ageing infrastructure as well as that the area is not a proclaimed municipal area, which means the water service provision will fall under the National Government through the Department of Water Affairs. The municipality acts as an agent of the community to facilitate water service delivery to Schulzendal area in conjunction with Matsamo Traditional Authority as an agent of the community.

Research Question 3: What spatial planning strategies can be proposed for household improving water service delivery in Schulzendal Village of Nkomazi Local Municipality?

Emergent Hypothesis: Short Term, Medium Term and Long-Term strategies can be applicable to solve water service delivery challenges in Schulzendal village and they can be optimised to fast track the process and deal with everyday challenges.

8.7.4 Seeking Negative Cases and Refining Emergence Hypotheses

Research Question 1: What is the condition of household water service delivery in Schulzendal Village of Nkomazi Local Municipality?

Refined Emergence Hypothesis:

While at a glance the main problem seems to be water service delivery infrastructure related, the broader status of Schulzendal household water service delivery includes planning issues (Unproclaimed area, DWS as a provider, Traditional Council & Municipality as agents through Co-Operative Governance), Infrastructural problems (Damaged and ageing, not maintained) and access and availability of water (reliance on natural sources of water and infrequent water availability from water provision infrastructures)

Research Question 2: What are the challenges faced by Nkomazi Local Municipality in the delivery of household water services to Schulzendal Village?

Refined Emergence Hypothesis:

Even though the challenges seem to be mainly on ageing, damaged, and unmaintained infrastructure, the major challenges faced by Nkomazi Local Municipality in delivering household water services to Schulzendal village is that the village is not proclaimed, this means that water service provision for Schulzendal will fall under DWS in liaison with CoGHSTA and Matsamo Traditional Authority

Research Question 3: What spatial planning strategies can be proposed for improving household water service delivery in Schulzendal Village of Nkomazi Local Municipality?

Refined Emergence Hypothesis:

The apparent strategies to solve Schulzendal Village household water service delivery strategies are literature orientated, however, strategies to improve Schulzendal Village Water service delivery (Short-term, Medium-term, & Long-term) should be planning orientated and foster Co-Operative governance among various spheres of government.

8.7.5 Triangulation and Corroboration

The research methodology adopted in this study employed various methods which will be useful in strengthening credibility of hypothesis testing. This study's observation has highlighted how at a glance, one would think that the main problem in Schulzendal Village household water service provision was provision and maintenance of infrastructure. Interviews from the community has supported such observations but when various spheres of government were brought into the process than a new perspective was adopted. The interviews from the municipality have shed light that the problem is more on the planning side than the infrastructure itself. Then interviews from the traditional authority has indicated the involvement of other spheres of government such as DWA as well as CoGHSTA.

Taking into account and triangulation all of the information above, it can be noted that Schulzendal Village mostly has a planning problem instead of what appears on the ground as poor household water service delivery and infrastructure challenges. There are several positive take ons that pave the way for possible solution but there are also drawbacks as well. Nkomazi Local Municipality is already a water service authority, but as Schulzendal Village is not proclaimed, then this had made providing household water services a very difficult task for the municipality.

8.7.6 Articulating Findings as Contextualized Understandings

The study's findings where well-articulated throughout the previous chapters. But the highlights so far have been that one problem seemed to be nesting multiple problems within it and as such it required a multifaced approach as it will be implemented later on applicable spatial planning strategies that will improve the level of household water service delivery in Schulzendal Village.

The main challenge is planning for household water service delivery in Schulzendal Village. Even though the constitution has mandated municipal planning as part of local government responsibility, this study has shown how difficult it is for Nkomazi Local Municipality to deliver their constitutional mandate to an unproclaimed area. To go around such a problem, the municipality had to embark on a tedious and lengthened Co-Operative governance process which has proved to be ineffective and led to the current situation within the village.

8.8 Overall Summary

This study adopted both qualitative and quantitative approaches to answer the set research questions in order to meet all of the study's objectives to satisfaction. A thorough and rural/marginalised areas orientated literature review was conducted which enabled the researcher to unearth key issues leading to the problem that we see on the ground in most South African rural and marginalised areas. This enabled the researcher to deeply uproot such key issues through a detailed and guided research methodology process covering stakeholders such as Municipal Officials, Community members, as well as Traditional Leaders.

This approach further uprooted the deep lying and underlying issues that were not apparent from the beginning such as the jurisdiction of various spheres of government when it comes to service delivery. Key words such as Municipal Planning Area & Proclaimed areas played a vital role guiding the solutions/strategies that the researcher came up with and this highlighted more on Cooperative governance as one of the key short-term solutions. As such a more focused and detailed conclusions and abstract was able to be drawn from the study and ultimately key strategies and solutions were recommended/proposed to fully satisfy and meet the study objectives.

Moreover, this study did not only find possible and viable solutions for the research problem statement but also touched areas such as contribution to the existing knowledge gap. This was achieved thanks to the research methodology and a qualitative approach based hypothesis testing process that was undertaken within the study. Towards the end of the study, it was clear that even though this research focused on a specific study field, other field of future research/studies were also uprooted along with this study's findings leading to a thorough research approach.

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APPENDICES

APPENDIX A: HOUSEHOLD QUESTIONNAIRES



I am undertaking a research study titled, **SPATIAL PLANNING STRATEGIES FOR IMPROVING HOUSEHOLD WATER SERVICE DELIVERY IN SCHULZENDAL VILLAGE OF NKOMAZI LOCAL MUNICIPALITY**. This study is conducted as a minimum requirement for the fulfilment of the Master's Degree in Urban and Regional Planning. I humbly request your objective assistance by completing this questionnaire. Your responses will be solely used for academic purposes only and information collected will be treated with out-most confidentiality. Thank you.

Researcher : Shakoane IG

Student no : 16003476

Supervisor : Dr. Ingwani E

Co- Supervisor: Nyamwanza S

ADMINISTRATIVE INFORMATION

Date :

Respondent number:

Place of interview :

SECTION A: SOCIO-DEMOGRAPHIC PROFILE

Instructions: please use a cross X to mark your response.

1.1.1.1.1.1. Gender

Female		Male	
--------	--	------	--

2. Age

18-25		26 -35		36 - 43		44 - 52		>52	
-------	--	--------	--	---------	--	---------	--	-----	--

3. Occupation

.....

4. How long have you been staying in Schulzental Village?

Less than 5years	
6-10 years	
11 – 15years	
More than 16 years	

SECTION B: Community's view on the condition of household water service delivery in Schulzendal village.

5. What is your primary source of household water?

Tap within a household/stand	
Communal Tap	
Communal Borehole	
Delivered via communal Water Tankers	
Buy from private Business Water Tankers	
Other Sources (Fountain, river, dam, spring, rain tanks etc)	

6. What is the condition of your household water service delivery related infrastructure?

Household water service delivery infrastructure	Is it available?	Is it working?
Household tap.		
Communal tap.		
Rainwater harvesting tanks		
Communal Boreholes		
Household Boreholes		
Communal water tanks		

7. How far is the nearest water source from your home?

Less than 100m	
100m to 150m	
More than 200m	

8. How often do you get household water from your source?

Daily	
Weekly	
Fortnightly	
Monthly	
Other	

9. Has there been any recent changes in the availability of water and if so, how?

Yes		No	
-----	--	----	--

10. Are you satisfied with the quality of the water you receive? Please explain your answer.

Yes		No	
-----	--	----	--

11. Have you experienced any health problems related to the water quality? Please explain your answer.

Yes		No	
-----	--	----	--

12. How is the clarity, Odor, and colour of your household water?

Water Quality Indicator	Good	Fair	Bad
Odor			
Color			
Clarity/Turbidity			

13. Can you afford other means to get household water instead of government provided services?

Yes		No	
-----	--	----	--

14. What household water service delivery challenges are you currently faced with?

Type of challenges	X
Inadequate water sources	
Lack of community involvement	
Poor water supply infrastructure	
Water source accessibility issues	
Water supply management/governance issues	
Other	

When faced with household water service delivery challenges, where do you usually report such issues?

Head of the community civic structure	
Ward Councillor	
Chief	
Schulzendal Local Municipality Offices	
District Offices	
Other	
Nowhere to report	

SECTION C: SPATIAL PLANNING STRATEGIES TO IMPROVE THE CONDITION OF HOUSEHOLD WATER SERVICE DELIVERY IN SCHULZENDAL VILLAGE.

10. In your opinion, what would you suggest should be done to solve the existing household water service delivery challenges in Schulzandal village?

Liaise with other spheres of government to intervene.	
Engage the community on possible solutions to the problem.	
Coordinate with Civic structures to identify and solve the root cause of the problem	
Engage relevant stakeholders on ways to solve the problem	
Plan for water infrastrucure	
Other (Specify below)	

.....

.....

.....

11. What is your long-term household water related concerns in Schulzandal Village?

Inadequate natural water sources	
High water demand/water scarcity	
Dilapidating infrastructure	
Declining/poor water service	
Other (specify below)	

.....

.....

.....

THANK YOU FOR PARTICIPATING IN THIS STUDY

APPENDIX B: OBSERVATION CHECKLIST



SPATIAL PLANNING STRATEGIES FOR IMPROVING HOUSEHOLD WATER SERVICE DELIVERY IN SCHULZENDAL VILLAGE OF NKOMAZI LOCAL MUNICIPALITY

OBSERVATION CHECKLIST.

Researcher : Shakoane IG

Student no : 16003476

Supervisor : Dr. Ingwani E

Co- Supervisor: Nyamwanza S

ADMINISTRATIVE INFORMATION

Date :

Place :

Household Water Service Delivery Observation Checklist

Location and condition of Infrastructure/water sources (Wells, Rivers, Boreholes, Taps etc)

Item to be observed	Very good	Good	Neutral	Bad	Very Bad	Comments/short notes
House taps						
Communal taps						
House tanks						
Communal tanks						
Boreholes						
Dams/River/springs						

Is there a paved pathways or roads leading to available water sources?

Yes		No	
-----	--	----	--

How is the clarity, odor, and color of water at different sources?

.....

Are there any signs of water contamination (e.g., visible pollutants, algae)?

Yes		No	
-----	--	----	--

Is there any water distribution schedules or timetables?

Yes		No	
-----	--	----	--

Are there any community-managed water committees or groups?

Yes		No	
-----	--	----	--

Are there any signs of community participation in water facility maintenance?

Yes		No	
-----	--	----	--

Is there a presence of community information boards regarding household water services?

Yes		No	
-----	--	----	--

Are there any efforts to protect water sources from contamination or degradation?

Yes		No	
-----	--	----	--

Are there any ongoing maintenance activities at water facilities?

Yes		No	
-----	--	----	--

Is the water infrastructure working properly?

Yes		No	
-----	--	----	--

Is water available and reliable?

Yes		No	
-----	--	----	--

Is there a record of recent repairs or maintenance work?

Yes		No	
-----	--	----	--

How often do they get access to water?

.....

Description of the condition of water infrastructure:

.....

Any security concerns or incidents related to household water service delivery:

.....

Additional observations, comments, and recommendations:

.....

.....

APPENDIX C: KEY INFORMANTS INTERVIEW

INTERVIEW FOR KEY INFORMANTS IN WATER SERVICE DELIVERY IN SCHULZENDAL VILLAGE OF NKOMAZI LOCAL MUNICIPALITY (MUNICIPAL OFFICIALS).



This interview is directed to the key informant from municipal officials at the Nkomazi Local Municipality.

I am undertaking a research study titled, **SPATIAL PLANNING STRATEGIES FOR IMPROVING HOUSEHOLD WATER SERVICE DELIVERY IN SCHULZENDAL VILLAGE OF NKOMAZI LOCAL MUNICIPALITY**. This study is conducted as a minimum requirement for the fulfilment of the Master's Degree in Urban and Regional Planning. I humbly request your objective assistance by completing this questionnaire. Your responses will be solely used for academic purposes only and information collected will be treated with out-most confidentiality. Thank you.

Researcher : Shakoane IG

Student no : 16003476

Supervisor : Dr. Ingwani E

Co- Supervisor: Nyamwanza S

ADMINISTRATIVE INFORMATION

Date :

Respondent no:

Place of interview:

SECTION A: DEMOGRAPHIC PROFILES

Instructions: please uses a cross X

1. Gender

Female		Male	
--------	--	------	--

2. Age

16-26		26-36		36-46		46-56		>56	
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Section B: Career background

3. Which department /division related to household water service delivery do work for?

.....
.....

4. What's your position and role in the department?

.....
.....

5. How long have you been working in Nkomazi Municipality?

.....
.....

SECTION B: THE CONDITION OF HOUSEHOLD WATER SERVICE DELIVERY IN SCHULZENDAL VILLGAE.

The condition of household water service delivery Infrastructure in Schulzendal Village

6. What is the condition of the existing water infrastructure in Schulzendal Village?

.....

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7. How often is maintenance conducted on the water infrastructure and what are the major challenges faced in maintaining it?

.....

.....

8. Describe the condition of Shulzendal Village household water service delivery in terms of the following:

Status quo of household water service delivery	Description
Infrastructure (e.g., taps, tanks, boreholes etc.)	
Water Quality	
Affordability	
Availability	
Accessibility/ Location of the water sources	

The condition of household water service delivery governance in Shculzendal village

9. How does the municipality involve community in decision making regarding water service delivery?

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10. Are there regular meetings or platforms for community feedback on water related issues?

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11. What steps are being taken to ensure equitable access to water services for all residents of Schulzendal Village?

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12. How is the municipality addressing the disparities in household water service delivery challenges in Schulzendal Village?

.....

.....

13. What measures are in place to address disruptions of household water service delivery?

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.....

.....

14. Is there a contingency plan for ensuring continued water supply during scarce water periods?

15. According to your department records, how many estimated households has access to water and how many do not have?

.....

.....

16. What are your deliverable targets when it comes to access to water at household level in Schulzendal village?

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.....

17. Did you manage to meet your targets and why?

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.....

18. Are there partnerships with NGO's, other municipalities, or governmental agencies to improve household water service delivery in Schulzendal village?

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.....

SECTION C: HOUSEHOLD WATER SERVICE DELIVERY CHALLENGES

19. What are the municipality's short term and long-term plans to enhance household water service delivery in Schulzendal Village?

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20. Are there specific priorities identified for addressing water related challenges in the near future?

.....

.....

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21. What mechanisms are in place for residents to provide feedback or register complaints regarding household water service quality and delivery in Schulzendal Village?

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22. How are complaints addressed and resolved by the Municipality?

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.....

.....

23. What are the major challenges faced in delivering household water services in Schulzendal and what strategies are being implemented to overcome them?

.....

.....

.....

SECTION D: RECOMMENDATIONS TO IMPROVE THE CONDITION OF HOUSEHOLD WATER SERVICE DELIVERY IN SCHULZENDAL VILLAGE

What do you think should be done to address and improve the water service delivery challenges faced by the public in Schulzendal Village?

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What spatial planning strategies can be implemented to improve household water service delivery in Schulzendal village?

.....

.....

.....

THANK YOU FOR PARTICIPATING IN THIS STUDY

APPENDIX D: REQUEST FOR PERMISSION TO CONDUCT RESEARCH



To : The Municipal Manager

Nkomazi Local Municipality

SUBJECT: REQUEST FOR PERMISSION TO CONDUCT A DISSERTATION RESEARCH
IN NKOMAZI LOCAL MUNICIPALITY.

I IG Shakoane, Student Number: 16003476, from the Department of Urban and Regional Planning at the University of Venda, hereby request for permission to undertake dissertation research in your municipality. My research topic is the "Spatial Planning Strategies for Improving Water Service Delivery in Rural Areas of Nkomazi Local Municipality". Kindly see attached ethical clearance certificate from the University.

For more information, please do not hesitate to contact me at 072 933 4344 or my Supervisor, Dr E. Ingwani via Phone: 073 519 1522/ Email: Emaculate.Ingwani@univen.ac.za

Your permission and approval in this regard will be very much appreciated.

Regards,



IG Shakoane

Student Researcher

APPENDIX E: LETTER OF APPROVAL TO CONDUCT RESEARCH



Enq: Mr AR Rana
Cell: 083 268 4457

9Park Street- Malelane
Private Bag X101
Malelane
1320
Tel: 013 7900245/6/7
Fax: 013 7900886
Customer care no: 013900990
Email: gabby.nkosi@nkomazi.gov.za

OFFICE OF THE MUNICIPAL MANAGER

To : The Head of Department
University of Venda
Private Bag X5050
THOHOYANDOU
0950

RE: LETTER OF APPROVAL TO CONDUCT RESEARCH AT NKOMAZI LOCAL MUNICIPALITY

The above matter refers:

1. This letter serves to confirm that **IG. Shakoane** who is currently studying from the Department of Urban and Regional Planning at University of Venda and researching towards completion of his thesis titled *"Spatial Planning Strategies for Improving Water Service Delivery in Rural Areas of Nkomazi Local Municipality: A case study of Nkomazi Local Municipality"*.
2. The Office of the Municipal Manager hereby commit to assist **IG Shakoane** with any information that he may require and also avail officials assigned with Training and Skills Development to work with her as and when need arises.
3. We hope after completing the research you will be equally so to graduate towards your Doctoral and the research findings and recommendations be of benefit to our municipality.

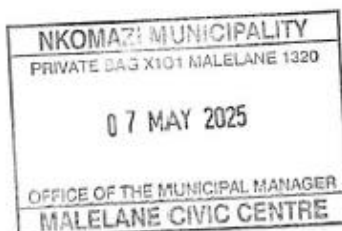
We hope this letter will serve the purpose and do not hesitate to contact our office should there be further information needed as a requirement by the University.

Our office wishes you ~~all the best~~ in his academic studies.

Yours in good governance


MUNICIPAL MANAGER
MR. XT MABILA

DATE: 07/05/2025



BETTER LIFE

APPENDIX F: ETHICS APPROVAL CERTIFICATE

ETHICS APPROVAL CERTIFICATE

ETHICS APPROVAL CERTIFICATE

FACULTY OF SCIENCE, ENGINEERING AND AGRICULTURE RESEARCH ETHICS COMMITTEE

NAME OF RESEARCHER/INVESTIGATOR: SHAKOANE IG

STAFF/STUDENT NO: 16003476

PROJECT TITLE: Spatial Planning strategies for improving household water service delivery in Schulzendal village of Nkomazi Local Municipality.

ETHICAL CLEARENCE NO: FSEA/24/URP/39

SUPERVISORS/ CO-RESEARCHERS/ CO-INVESTIGATORS

NAME	INSTITUTION & DEPARTMENT	ROLE
Dr. E Ingwani	University of Venda, Urban and Regional Planning	Supervisor
Ms S Nyamwanza	University of Venda, Urban and Regional Planning	Co-Supervisor

Type: Student research

Risk: Minimal risk to humans, animals, or environment (Category 1)

Approval Period: October 2024 – September 2026

The Faculty Research Ethics Committee (FREC) of the Faculty of Science, Engineering and Agriculture hereby approves your project as indicated above.

General Conditions

While this ethics approval is subject to all declarations, undertakings and agreements incorporated and signed in the application form, please note the following.

- The project leader (principal investigator) must report in the prescribed format to the REC:



University of Venda

PRIVATE BAG X5050, TLOHOYANDOU, 0950, LIMPOPO PROVINCE, SOUTH AFRICA
TELEPHONE (015) 962 8394/8107. FAX (015) 962 8000
"A quality driven financially sustainable, Comprehensive University"

ETHICS APPROVAL CERTIFICATE

- Annually (or as otherwise requested) on the progress of the project, and upon completion of the project
 - Within 48hrs in case of any adverse event (or any matter that interrupts sound ethical principles) during the project.
 - Annually, research projects may be randomly selected for auditing.
 - The approval applies strictly to the protocol as stipulated in the application form. Should a change to the protocol be deemed necessary during the project, the project leader must apply for approval of these changes before their implementation. Should there be a deviation from the study protocol, without the necessary approval for the change, the ethics approval is automatically forfeited.
 - The date of approval indicates the earliest date that the project may begin. Should the project have to continue after the expiry date; a new application must be made, and a new approval received before or on the expiry date.
 - In the interest of ethical responsibility, the FREC retains the right to:
 - Request access to any information or data at any time during the course or after completion of the project,
 - To ask further questions; Seek additional information; Require further modification or monitor the conduct of your research or the informed consent process.
 - withdraw or postpone approval if:
 - Any unethical principles or practices of the project are revealed or suspected.
 - It becomes apparent that relevant information was withheld from the REC or that information has been false or misrepresented.
 - The required annual report and reporting of adverse events was not done timely and accurately,
 - New institutional rules, national legislation or international conventions deem it necessary
-

ISSUED BY:

FACULTY OF SCIENCE, ENGINEERING AND AGRICULTURE RESEARCH ETHICS COMMITTEE

Date considered: 03 October 2024



Chairperson: Prof. L.C Murulana



University of Venda

PRIVATE BAG X5050, TLOHOYANDOU, 0950, LIMPOPO PROVINCE, SOUTH AFRICA
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APPENDIX G: ETHICS RESEARCH COMMITTEE, UNIVEN INFORMED CONSENT

RESEARCH ETHICS COMMITTEE

UNIVEN Informed Consent

Appendix B

LETTER OF INFORMATION

Title of the Research Study : Spatial planning strategies for improving household water service delivery in Schulzendal Village of Nkomazi Local Municipality

Principal Investigator/s/ researcher : Ingiphile Gift Shakoane

Co-Investigator/s/supervisor/s : Dr. Emaculate Ingwani, Ms. Shylet Nyamwanza

Brief Introduction and Purpose of the Study: Globally, the provision of adequate, affordable, and high-quality basic services is regarded as a core function of municipal governments. However, the status quo of household water service delivery in rural areas of Nkomazi Local Municipality, reflects persisting high number of households without access to water service delivery. Therefore, this study aims to propose spatial planning strategies for improving household water service delivery in Schulzendal Village of Nkomazi Local Municipality. The study will ascertain the status of household water service delivery, determine the challenges faced by Nkomazi Local Municipality in the delivery of household water services and also propose spatial planning strategies for improving household water service delivery in Schulzendal Village of Nkomazi Local Municipality.

Outline of the Procedures: Key informant interviews will be conducted with Nkomazi Local Municipality officials and Traditional leaders of Schulzendal Village. Respondents are expected to respond based on their experience, expertise, & understanding of issues in Schulzendal village. Schulzendal village households are also expected to answer some questions in a form of a questionnaire. The researcher will also conduct a participant observation within the study area.

Risks or Discomforts to the Participant: Not applicable

Benefits: Should the findings and strategies proposed by this study be implemented by policy makers and the municipality, it will ensure that problem of household water service delivery is addressed as a matter of urgency, given that service delivery is a constitutional mandate and access to water is a human right. The researcher hopes to publish this body of work with reputable publishers.

Reason/s why the Participant May Be Withdrawn from the Study: *(Non-compliance, illness, adverse reactions, etc. Need to state that there will be no adverse consequences for the participant should they choose to withdraw)*

Remuneration : None

Costs of the Study : None, the participants are not expected to cover any costs.

Confidentiality : Participants' personal information such as names & surnames will not be disclosed. Participants will not be asked to provide their identity numbers.

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Research-related Injury : (What will happen should there be a research-related injury or adverse reaction? Will there be any compensation?)

Persons to Contact in the Event of Any Problems or Queries:

Please contact the following individuals

Ingiphile Gift Shakoane (Researcher)

Contact information: 072 933 4344 / ingiphileshakoane1@gmail.com / 16003476@mvula.univen.ac.za

Dr E. Ingwani (Supervisor)

Contact information: (Please insert your office contact Dr) Emaculate.Ingwani@univen.ac.za

Ms. S. Nyamwanza (Co-Supervisor)

Contact information: 015 962 8592 / shylet.nyamwanza@univen.ac.za

University Research Ethics Committee Secretariat

Contact information: 015 962 9058 / Vanecia.Khoza@univen.ac.za

Complaints can be reported to the University Research Ethics Committee Secretariat on 015 962 9058 / Vanecia.Khoza@univen.ac.za or Whistle blowing Ethics Hotline Tollfree Telephone number: 0800212755 Email.univenhotline@tipoffs.com

General:

Potential participants must be assured that participation is voluntary and the approximate number of participants to be included should be disclosed. A copy of the information letter should be issued to participants. The information letter and consent form must be translated and provided in the primary spoken language of the research population

CONSENT

Statement of Agreement to Participate in the Research Study:

- I hereby confirm that I have been informed by the researcher, Ingiphile Gift Shakoane about the nature, conduct, benefits and risks of this study - Research Ethics Clearance Number: __
- I have also received, read and understood the above written information (*Participant Letter of Information*) regarding the study.
- I am aware that the results of the study, including personal details regarding my sex, age, date of birth, initials and diagnosis will be anonymously processed into a study report.
- In view of the requirements of research, I agree that the data collected during this study can be processed in a computerized system by the researcher.
- I may, at any stage, without prejudice, withdraw my consent and participation in the study.

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- I have had sufficient opportunity to ask questions and (of my own free will) declare myself prepared to participate in the study.
- I understand that significant new findings developed during the course of this research which may relate to my participation will be made available to me.

Full Name of Participant	Date	Time	Signature
I, ...			

Ingiphile Gift Shakoane herewith confirm that the above participant has been fully
Informed about the nature, conduct and risks of the above study.

Full Name of Researcher

.....	Date.....	Signature.....
-------	-----------	----------------

Full Name of Witness (If applicable)

.....	Date	Signature.....
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Full Name of Legal Guardian (If applicable)

.....	Date.....	Signature.....
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Please note the following:

Research details must be provided in a clear, simple and culturally appropriate manner and prospective participants should be helped to arrive at an informed decision by use of appropriate language (grade 10 level- use Flesch Reading Ease Scores on Microsoft Word), selecting of a non-threatening environment for interaction and the availability of peer counseling (Department of Health, 2004)

If the potential participant is unable to read/illiterate, then a right thumb print is required and an impartial witness, who is literate and knows the participant e.g. parent, sibling, friend, pastor, etc. should verify in writing, duly signed that informed verbal consent was obtained (Department of Health, 2004).

If anyone makes a mistake completing this document e.g. a wrong date or spelling mistake, a new document has to be completed. The incomplete original document has to be kept in the participant's file and not thrown away, and copies thereof must be issued to the participant.

APPENDIX H: PROJECT REGISTRATION/ UHDC APPROVED MASTER'S PROPOSAL



University of Venda

Faculty of Science, Engineering and Agriculture

DEPARTMENT: URBAN AND REGIONAL PLANNING

To : SHAKOANE I.G

From : Prof J Chakwizira
FSEA Higher Degree Committee staff member

Date : 30/07/2024

Approval of a dissertation/thesis proposal for ethics submission

Project title: Spatial Planning strategies for improving household water service delivery in Schulzental village of Nkomazi Local Municipality

Name	Student/staff nr	Role within project				
		Project leader	student	external collaborator	supervisor	co-supervisor
SHOKOANE I.G	18003476	x			Dr. E. Ingwani	Ms. S. Nyamwanza

Project registration number: FSEA/24/URP/39

Prof/Dr
FSEA Higher Degrees Committee member in the Department

FOR



Prof/Dr
HOD

APPENDIX I: LANGUAGE EDITING CERTIFICATE



Language Editing Report

Date: 08 May 2025

To whom it may concern.

This letter serves to confirm that I, B N Rumutsa proofread and edited a dissertation titled: **"SPATIAL PLANNING STRATEGIES FOR IMPROVING HOUSEHOLD WATER SERVICE DELIVERY IN SCHULZENDAL VILLAGE OF NKOMAZI LOCAL MUNICIPALITY.."**, by **INGIPHILE GIFT SHAKOANE**, (Student Number, **16003476**), to be submitted to the Department of Urban and Regional Planning, Faculty Of Science, Engineering And Agriculture, University of Venda.

I carefully read through the dissertation, focusing on language and grammatical construction errors that needed corrections to the best of my ability. Neither the dissertation content nor the author's intentions were altered in any way during the editing process.

Yours sincerely



B. N Rumutsa
(Language editor)

Email: brendarumucha@yahoo.com

APPENDIX J: PROOF OF REGISTRATION



PROOF OF REGISTRATION

To Whom It May Concern

19-Mar-2024

It is hereby confirmed that the under mentioned person is a registered student at University of Venda Production.

Student Number: 16003476
Student ID Number: 9805230492087
Name: INGIPHILE GIFT SHAKOANE
Registered for Period: 09-Jan-2024 - 11-Dec-2024
Qualification: ESMURP MASTER OF URBAN AND REGIONAL PLANNING

Subject	Description	Qual.	Class Group	Exam Year	Exam Month	Cancel	Offering Type	Amount
URP6390	H3 MASTERS STUDENTS RESEARCH AND DISSERTATION 6390	ESMURP	A	2024	11	N	06	18780.00
Subtotal:								18780.00
Total:								18780.00

Outstanding Balance: 47363.76



DR. J.J. BALOYI
UNIVERSITY REGISTRAR

University of Venda
Creating Future Leaders

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APPENDIX K: TURNITIN REPORT

SHAKOANE RESEARCH.pdf			
ORIGINALITY REPORT			
12%	10%	7%	3%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS
PRIMARY SOURCES			
1	vital.seals.ac.za:8080 Internet Source	1	1%
2	hdl.handle.net Internet Source	1	1%
3	www.arl-international.com Internet Source	1	1%
4	Submitted to University of Venda Student Paper	<1	<1%
5	researchspace.ukzn.ac.za Internet Source	<1	<1%
6	Submitted to Mancosa Student Paper	<1	<1%
7	lg.treasury.gov.za Internet Source	<1	<1%
8	ulspace.ul.ac.za Internet Source	<1	<1%
9	mfma.treasury.gov.za Internet Source	<1	<1%
10	scholar.sun.ac.za Internet Source	<1	<1%