ASSESSING THE ROLE OF STAKEHOLDER'S EXPECTATIONS WITHIN THE WATER DEMAND MANAGEMENT STRATEGY IN A MINING MUNICIPALITY: RUSTENBURG LOCAL MUNICIPALITY

Thesis submitted in fulfillment of the requirements for the degree **Master of Philosophy in Integrated Water Management** at The Independent Institute of Education, IIEMSA.

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DECLARATION

I, **Olebogeng Stanley Mosoane**, hereby affirm that this thesis presented for the Master of Philosophy in Integrated Water Management at The Independent Institute of Education MSA is an original piece of work and has not been previously submitted to any other university or higher education institution for a postgraduate qualification.

Olebogeng Stanley Mosoane

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I dedicate this thesis to my mother and my sister, Penelope Mono and Kearabetswe Mosoane. Once again, thank you to all who have contributed to this thesis. Your support has been greatly appreciated.

DEDICATION

I would like to dedicate this thesis to two incredible mentors in my life, Mr. Mpho Elias Khunou and the ever-supportive Mme Kgomotso Sheila Mabale-Huma. I am deeply grateful for your unwavering belief in my passion for water and your constant encouragement even when it was not popular. Your faith in my abilities has meant the world to me, and I cannot thank you enough.

ABSTRACT

The objective of this research study was to evaluate the various perspectives and requirements of stakeholders regarding water demand management in the Rustenburg Local Municipality. The focus was particularly on understanding the expectations from government agencies, mining companies, and residents within a mining municipality. Furthermore, an analysis of stakeholder dynamics and their influence on the effectiveness of the existing management approach was conducted.

To accomplish the objectives of the study, extensive fieldwork and interviews were conducted to assess stakeholder viewpoints. The research also examined the perspectives and attitudes of various key stakeholder groups, including government entities such as water boards, mining companies, and local community members or representatives. Initial findings indicated that stakeholders held diverse expectations, highlighting the importance of an inclusive and responsive strategy for managing water conservation and demand.

Another objective of this study was to comprehend how stakeholder roles, interests, and expectations influenced the effectiveness of the current management approach. To achieve this goal, thorough interviews, and comprehensive survey methods were employed along with qualitative interviews to accurately capture the complexities associated with stakeholder perceptions and expectations.

This research study emphasized the significance of stakeholder involvement, collaboration, and reaching consensus in shaping future strategies for water conservation and management. It underscored the importance of adopting a comprehensive and inclusive approach towards developing effective water conservation programs. The study aimed to make substantial contributions to enhancing sustainable water conservation practices in municipalities driven by

mining activities while also having potential relevance for other communities that rely on limited resources.

This research study underscores the significance of adopting a collaborative and inclusive approach to water conservation and demand management strategies. It emphasizes the importance of active involvement, negotiation, and consensus-building in shaping future strategies. The findings of this study have valuable insights for enhancing sustainable water conservation practices in municipalities driven by mining activities, with potential implications extending to other communities reliant on natural resources.

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ABBREVIATIONS AND SYMBOLS

DWS	Department of Water and Sanitation
IDP	Integrated Development Plan
IWRM	Integrated Water Resource Management
kℓ	Kilo Liters
ℓ	Liters
Mℓ	Mega Liters
MO	Municipal Official
MW	Magalies Water
RBA	Royal Bafokeng Administration
RBN	Royal Bafokeng Nation
RBPM	Royal Bafokeng Platinum Mines
RLM	Rustenburg Local Municipality
RW	Rand Water
RWST	Rustenburg Water Services Trust
WB	Water Board
WC	Ward Councillor
WSA	Water Services Authority
WSDP	Water Services Development Plan
WSP	Water Services Provider
WSSA	Water and Sanitation Services South Africa
WTP	Water Treatment Works

CHAPTER 1: INTRODUCTION AND ORIENTATION OF THE STUDY AREA - RUSTENBURG LOCAL MUNICIPALITY

1.1 Introduction

Water is a scarce resource in South Africa, predominantly due to high water usage, and irregular and uneven patterns of rainfall. This is a huge natural constraint especially now that the country does not have surplus water (Turton, 2008). The demand for freshwater is growing due to the broadening perspective of water and its ecological, ethical, and cultural roles. During water scarcity periods and in downstream rural areas with limited access to surface water, groundwater is used as a backup drinking water source. It also supplements the resource supply for irrigation and industrial purposes (NWRS, 2013). However, the country's water table levels gradually drop due to insufficient rainfall that fails to replenish groundwater. Hence, it is of great importance for water resource management to balance the growing social, and economic needs and environmental health with the sustainability of the resource (Local Government Budgets and Expenditure Review, 2011). Sustainable water management is an important priority for the South African government and society.

According to the constitutional principles and legal frameworks of the Republic of South Africa, municipalities must take measures to enrich the residents' rights. By ensuring a healthy environment, and equal access to efficient, affordable, as well as sustainable drinking water supply services (Haigh *et al*., 2008). This involves the planning of water resources, development of water infrastructure, service delivery, and regulatory efforts to meet the needs of the residents within the area of its jurisdiction (NWRS, 2013). In addition, the need to take on the cost-effective and sustainable management and operation of water service infrastructure is of great priority (Haigh *et al*., 2008).

Moreover, the concept of demand management is closely aligned with this principle. The Department of Water Affairs and Forestry (2002) aims to integrate demand management into

their water services policies by discouraging inefficient and wasteful water usage through pricing strategies and conservation initiatives.

Consistency in the supply of clean and safe water is an important aspect of the services delivered by a Water Services Authority (WSA) such as Rustenburg Local Municipality (RLM). RLM has been authorised as a WSA in terms of the Municipal Structures Amendment Act (Act 33 of 2000). The municipality has the mandate and responsibility to conform with the Water Services Act (WSA) (Act 108 of 1997), and municipal by-laws and adhere to prescribed compulsory national norms and standards in accordance with Sections 9 and 10 of the Act (RSA, 1997).

Water Demand Management should be seen as a responsible approach that would contribute to the prosperity of our country (Nkondo *et al*., 2012). Hence the purpose of this research is to outline and assess the role of stakeholder's expectations within the water demand management strategy in a mining municipality being Rustenburg Local Municipality, and to suggest ways in which the role of stakeholders can positively contribute to the sustainability of our scarce resource.

1.2 Orientation and Connectivity

Rustenburg Local Municipality (RLM) is a category B Municipality that was established in terms of the Municipal Demarcation Act 27 of 1998, as defined in Section 155 (1) in the South African Constitution (RSA, 1998). The city is in the eastern part of the North-West Province and forms part of the border between South Africa and Botswana. The neighbouring municipalities that surround Rustenburg Local Municipality and form part of the Bojanala District Municipality are Kgetlengrivier Local Municipality, Moses Kotane Local Municipality, Madibeng Local Municipality and Moretele Local Municipality (RLM Water and Sanitation Master Plan, 2020). Located in the north RLM is the Royal Bafokeng Nation

(RBN) (Manson and Mbenga, 2003), which occupies over 1500 km2 of land with rural villages such as Phokeng, Ga-Luka and Chaneng. The traditional tribal community of the Bafokeng Nation is a key stakeholder in Rustenburg LM's future (RLM Integrated Development Plan 2020 – 2023). Figure 1.1 shows the location of the municipality within the North-West Province.

The study area Rustenburg Local Municipality is the core part of platinum mining in South Africa (Bezuidenhout and Buhlungu, 2015), and is divided into 45 wards, with a total geographical area of 3,423 km2 (RLM Integrated Development Plan 2022). It is one of the fastest-growing municipalities in South Africa with an estimated population annual growth rate of 3.5%, accommodating about 16% of the provincial population. A population of 549 575 was reported for Rustenburg during Census 2011, comprising 54.91% males and 45.09% females (Statistics South Africa, 2011).

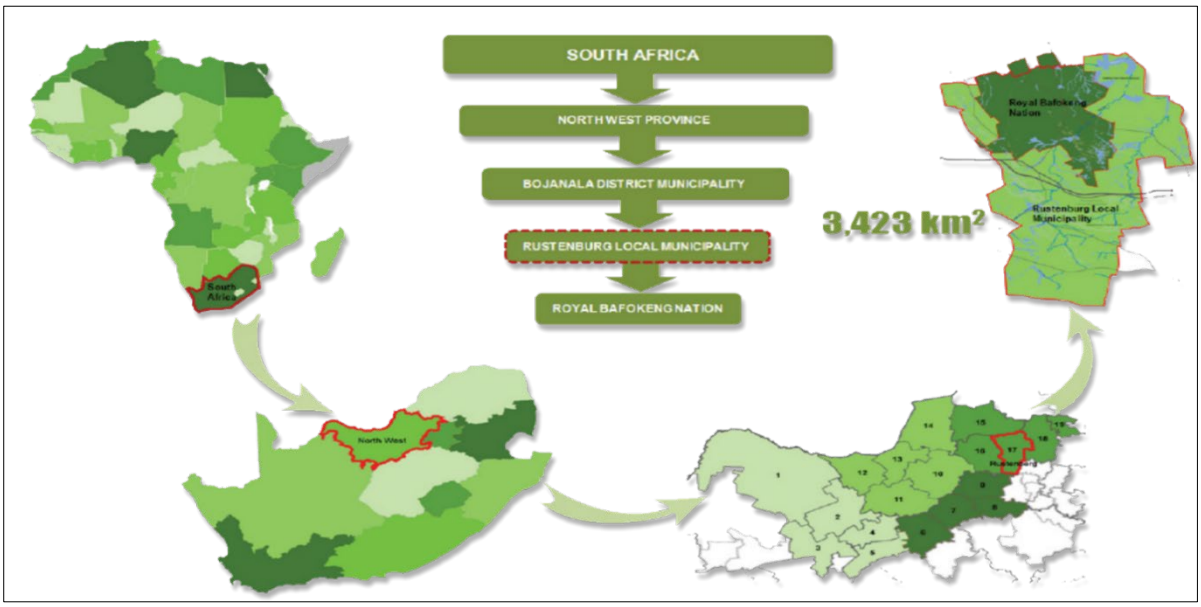

Figure 1: Location hierarchy of Rustenburg Local Municipality within the North-West Province of South Africa (RLM IDP, 2022)

According to the RLM Integrated Development Plan, Rustenburg is conveniently connected to major urban centres in South Africa such as Johannesburg and Tshwane, which are approximately 120km away. There are also smaller surrounding areas like Madibeng, Mogale City, Brits, Koster, Swartruggens, and Zeerust that can be accessed from Rustenburg through a well-developed regional road network. Examples of these roads include the N4 Freeway of the Platinum Corridor connecting Rustenburg to Tshwane in the east and Zeerust in the west. The R24 provides a link between Pretoria and Johannesburg in the south with Pilanesburg located northwards (RLM Integrated Development Plan 2020 - 2023).

Based on the Rustenburg Water Safety Plan (2022), Rustenburg is the most industrialised area in the Elands/Hex River catchment due to its strong mining sector, which plays a major role in the significant growth of the city. This then bestows upon the municipality the heavy responsibility to ensure that the drinking water supplied to its residents complies with the South African National Standards for drinking water (*SANS 241)* and all relevant legislation.

South Africa is the world's largest producer of platinum group metals (PGM) and more than 99.5% of these metals are mined in the Bushveld Igneous Complex within which Rustenburg is located. Furthermore, South Africa is also the world's leader in chromium production of which about 88% is mined in Rustenburg (Fearnley, 2005). The industry does put a strain on our water resources as more volumes of water are required for the mining processes as well as to sustain the ever-growing population due to migration and settlement.

1.3 Problem Statement

Rustenburg Local Municipality is a mining town situated in the Bojanala district in the North West province in South Africa. Rustenburg is part of the western bushveld igneous complex, which comprises the platiniferous ore deposits that drive the Rustenburg mining sector (Fearnley,2005). According to (Ndebele, 2013), Rustenburg is one of the fastest-growing cities

in the world, with an average annual growth rate of 1.6% to 2.9% during the last decade. Because of the recent platinum boom, several new surfaces and underground mining operations have commenced in the previous decade (Fearnley, 2005). This can be attested by the fact that the largest producers of platinum companies in the world are located 25 km from Rustenburg which are Impala, Anglo Platinum, and Sibanye Platinum mines.

There is evidence that there are competing factors between the mining community and residential communities which have led to service delivery protests and interruptions of services, and this was mainly due to the unavailability of water within the region. As per Ashton and Hardwick (2008), water demand management is a major challenge throughout South Africa due to pollution, over-exploitation, and increased scarcity as a result of climate change and increased demand for human consumption, irrigation, and industrial use. To meet everyone's needs, the water resource, which is under tremendous strain, must satisfy all of these varied demands equitably and adequately. Furthermore, the Water Services Act 108 of 1997 corroborates the need for water as a basic human right, but water services are also a source of economic drivers, and because several industrial processes rely on water, it is also regarded as a crucial factor for economic growth (Ashton et al., 2008).

Rustenburg Local municipality has a high-water demand, and this is because the supply is less than the demand. From the researchers' experience as a water municipal manager, this shortage includes high water usage by industries, excessive water usage for irrigation, excessive use and reliability of portable water by mines and industries, and excessive demand by residents or communities caused by the growing rate of the population. This has exacerbated the need for the municipality to implement a demand management strategy to strike a balance between the users of the resource to minimise and manage conflict. Using the case of Rustenburg Local Municipality in the Northwest Province; this study investigates the effects of the water demand management strategy within the framework of stakeholder management by the municipalities.

This research aims to investigate the strength and efficacy of stakeholder involvement and participation in water demand management strategies and the level of stakeholder input in the Water Demand Management approach and strategy of the Municipality. Water scarcity and constraints in the Rustenburg area, owing to growing mining, commercial, and residential development and subsequent growing demands in the water supply have been documented.

This research investigates the various aspects of water management and its interface with; stakeholder management, governance, legislative and regulatory, administrative, infrastructure planning, economics and pricing, water demand, supply, and user interface (Da-pinga et al, 2011). This study is within the context of competing and sometimes conflicting demands between mining activities, business, and domestic use in the Rustenburg Municipality Jurisdiction.

1.4 Objective of the Study

This study aimed to investigate the effects of the water demand management strategy within the framework of stakeholder management by the Rustenburg Local Municipality. The specific research objectives are as follows:

- To determine the extent of how stakeholder issues are taken to account in the water demand management strategy of the Municipality.
- To study water demand management strategies that the Rustenburg Local Municipality could pursue.
- To investigate strategies that Rustenburg Local Municipality could consider dealing with water demand management.
- To explore strategies for promoting the involvement of stakeholder management within the water demand management concept / strategy, and.

- Contextualize the water demand management in which stakeholder management takes place within the municipality.

1.5 Research Question

The intent of this research was to answer the following question:

How does stakeholder involvement at the Rustenburg local Municipality affect the municipalities Water Demand Management strategies?

Given the above research question, the following sub-questions were explored:

i) Who are the Rustenburg Local Municipality water demand stakeholders?

ii) How are stakeholders involved and what role do they play in water demand management process/decision making?

iii) How does ii) affect the overall water demand management strategy of the municipality?

iv) Is there sufficient stakeholder balance in the municipality's water demand management strategy?

v) How can municipalities improve stakeholder management and participation in their Water Demand Management strategies?

vi) What stakeholder issues are not addressed by the Municipality's water demand management strategy?

1.6 Rustenburg Local Municipality Water Provision System

Rustenburg Local Municipality is supplied with an average of 125 Mℓ/day water from three Water Boards being Rand Water (RW), Magalies Water (MW) and Water Services South Africa (WSSA) (RLM Water Safety Plan, 2022), with Rand Water being the largest supplier, which supplies the municipality with approximately 83% of its total demand. With the demand of freshwater resources growing, RLM uses groundwater (Boreholes System) to augment the

water supply as it is a consistent and reliable source of water, particularly in informal settlements where surface freshwater sources are limited.

As mentioned in the studies of (Vörösmarty *et al*., 2010), the demand for freshwater resources is growing globally which then led to new water supply sources becoming scarce, expensive, and politically controversial to the benefit of politicians. In the study area, there are two major and two minor surface water resources providing water supply to the RLM. The main resource is from Vaalkop Dam where water is abstracted by Magalies Water and treated at the Vaalkop water treatment works. The second largest supply is via the Barnardsvlei scheme operated by Rand Water. This water is abstracted from the Integrated Vaal River System and is treated at the Rand Water Zuikerbosch Water Treatment Plant (RLM Water Safety Plan, 2022).

The two minor supplies are from local resources owned by RLM, operated by WSSA via the appointed Rustenburg Water Services Trust as a third major Water Services Provider. The first is abstracted from Bospoort Dam via concrete canals to Bospoort Water Treatment Works where it undergoes extensive treatment processes for purification. the water is then pumped to various water reservoirs located over the Rustenburg area from where the potable water is fed into the water supply pipeline network to the consumers (RLM Water Safety Plan, 2022). The catchment is in an arid climatic area and the demand on water resources is extremely high – evaporation exceeds rainfall causing additional stress on an already water scarce catchment. The region is subject to summer rainfall, frequently occurring in the form of high intensity storms. According to Mogakabe and van Ginkel (2008), Bospoort Dam has been classified as hypertrophic.

Bospoort Dam is a gravity or earth-fill type of dam on the Hex River upstream of the Vaalkop Dam, a tributary of the Elands River, part of the Crocodile River (Limpopo) basin (Mogakabe and van Ginkel, 2008). It is located near Rustenburg, North-West Province, South Africa. Water is also abstracted from a small dam constructed in the Dorpspruit River which has its

origin in the Rustenburg Kloof and flows through the town of Rustenburg eventually making its way to the Bospoort Dam. The Dorpspruit is a non-perennial (intermittent) stream, and the dam is very small, so it runs dry in the winter (dry season) (Rustenburg Process Audit, 2020).

In 1933, the Bospoort Dam was established and was originally the main water supply for Rustenburg Town, In the late 60s, the dam was contaminated by platinum and chrome mines in the region, which resulted in the dam no longer being used for drinking water. Due to water shortage in the early 90s, it was again used as the main water source for the Greater Boitekong and surrounding townships. In 2009 and 2010, the municipality and the Water Services Trust embarked on a major rebuilding project for fear of the dam wall collapsing. The steel sluices had to be replaced as the water in the dam was corrosive, this resulted in the structure of the new dam being built from corrosion resistant compounds (Rustenburg Process Optimisation Audit, 2018).

For the second local resource, water is abstracted from the river upstream of Bospoort Dam and treated at the Kloof Water Treatment Works.

The land uses within the catchment area consist of urban developments such as Rustenburg, areas with intensive mining activities, and agricultural practices. The Bospoort dam is utilized for both irrigation purposes and domestic water supply. To ensure that the water is suitable for consumption in town, a water treatment facility known as Bospoort Water Treatment Works was constructed at the dam. However, due to an increase in deterioration of water quality caused by excessive growth of algal bloom leading to taste and odour issues, the operation of Bospoort WTP has been suspended. This taste and odour problem has also affected Vaalkop dam which receives its water from Bospoort dam and is another source supplying potable water to Rustenburg region.

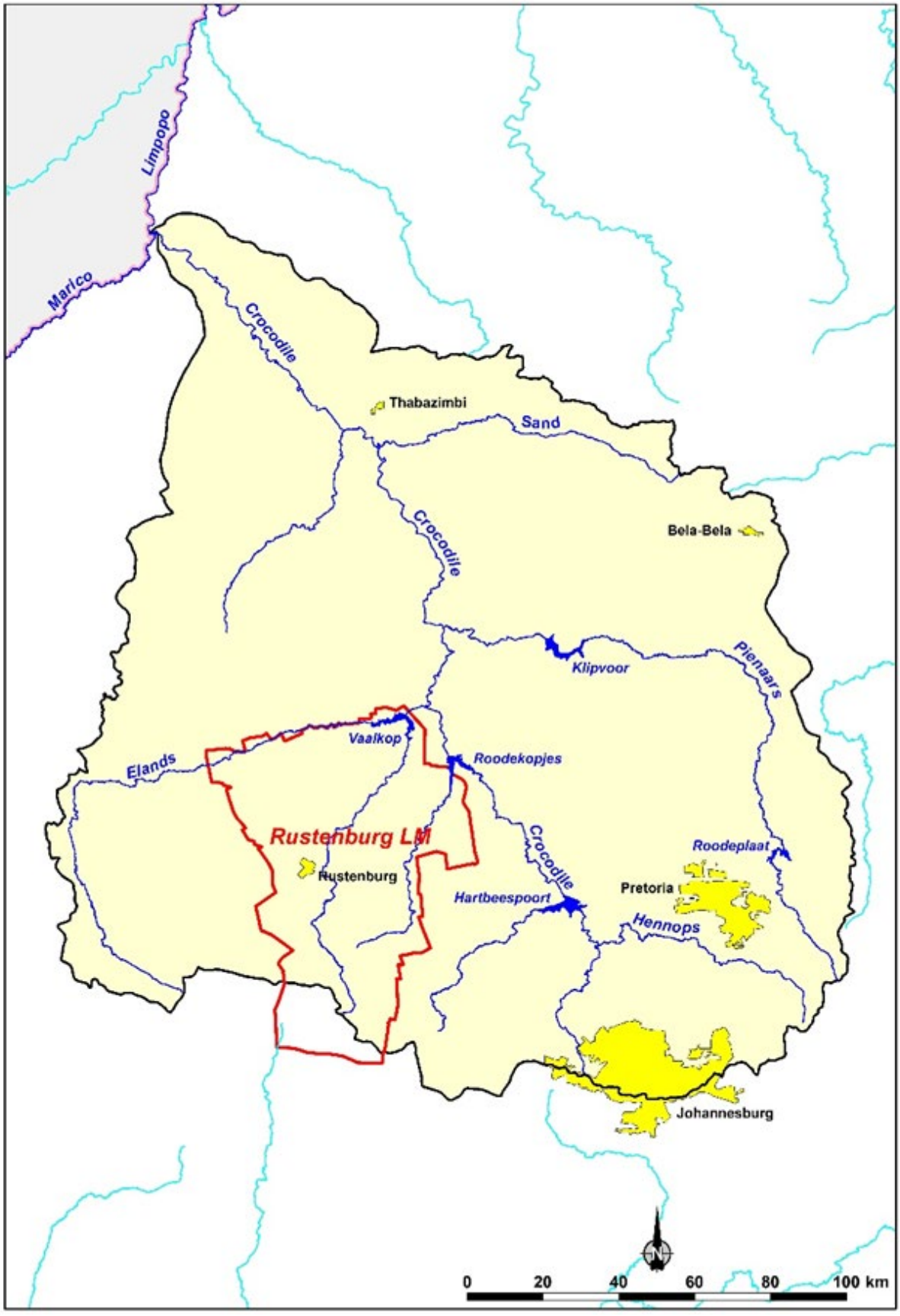

Figure 2: Locality of Rustenburg LM relative to Crocodile West River Catchment

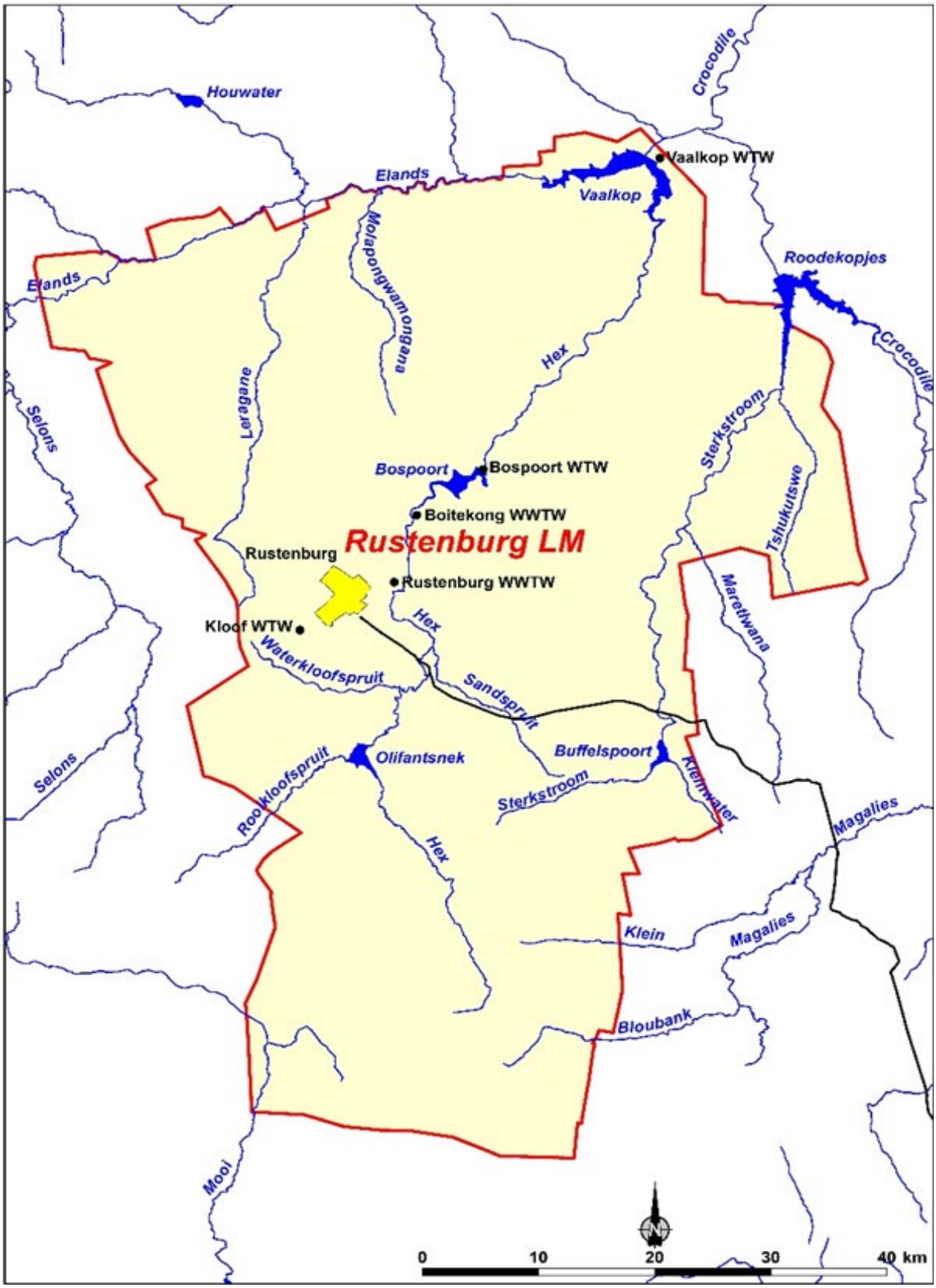

Figure 3: Locality Map of the RLM and abstraction System

Table 1: A table showing Water Treatment Works Sources and allocation volume.

Source	Confirmation Report No.	Allocation Volume (m^3/annum)	Comments
Bospoort Dam via Bospoort WTP	2603 1026, WUN 1	4 220 000	A new water use license application has been submitted to DWS for the upgrade of the WTP, awaiting feedback
Kloof WTP (also referred to as "Old works")	2603 1026, WUN 2	200 000	The registered use from the Old Water Works in the Kloofspruit is in process of being verified as Existing Lawful Water Use (validation letter has been prepared and on route to Regional Head: North-West of the DWS for signature).
Vaalkop Dam	2603 1277, WUN 1	90 550 000	This is the total allocation for Magalies Water Board of which RLM only receives a portion. The specific portion is not stipulated in the confirmation report.
Vaal Dam	Permit: 60/16/2/91	1 347 107 745	This is the total allocation for Rand Water Board of which RLM only

			receives a portion. The portion targeted for RLM to utilise under the Project 1600 drive is 11.61 million m^3/annum (RW, 2020)

Table 2: Bospoort Dam Data

Bospoort Dam Data	
Coordinates	25`33`45''S 27`21`14''E
Owner	Department of Water and Sanitation
Type of Dam	Combination gravity and earth fill
Impounds	Hex River
Height	23 m
Length	468 m
creates	Bospoort Dam Reservoir
Total Capacity	18 200 000 m^3

CHAPTER 2: LITERATURE REVIEW

2.1 STAKEHOLDER MANAGEMENT PARADIGMS WITHIN A MUNICIPAL SETTING

2.1.1 Introduction

Municipalities are responsible for managing various stakeholders, including community groups, individuals, businesses, and other organizations. While establishing a network of stakeholders to create public value may not be easy or objective in nature (Haarhoff, 2019:43), aligning resources with the identified shared public value will require persuasive and authoritative engagement. Water management encompasses tasks such as system operation, financial input, planning, policymaking, and making useful decisions on different timescales from hourly to decadal.

To effectively manage decisions regarding water allocations, it is crucial to consider the perspectives and expectations of various stakeholders. Collaborative engagement among individuals such as water users, operators, administrators, policymakers, and the public is essential for successful implementation of legislation and policies related to water management. This collaborative approach ensures a shared vision and continuous communication between stakeholders involved in determining water allocation strategies. By understanding stakeholder needs and valuing their input, robust public policies can be developed that address current challenges while also preparing for future ones. It is important to establish clear responsibilities across all concerned stakeholders through effective governance mechanisms in order to ensure efficient monitoring and evaluation of freshwater resources.

Social processes play a significant role in three key aspects of water management: the demand for water, the methods used for managing it, and the institutions responsible for its

management. Economic concepts have gained extensive popularity in these areas, likely due to water's predominantly economic use and the potential benefits of treating it as a commodity [Briscoe, 1997; Hanemann, 2006; Hanak et al., 2011]. The appreciation of stakeholder participation will be explored in the chapter, the disadvantages, and advantages of involving stakeholders within a water demand strategy of the municipality.

2.1.2 Stakeholder Paradigms within the Municipal Environment

The study of joint value creation has emerged as a focal point in the field of business and management research (Martin, and Parmar, 2007). Joint value creation encompasses a collaborative effort where multiple parties, with interdependent relationships, contribute to the process of creating value for the firm in a mutually beneficial manner (Santos, 2021). This is influenced by the need for collaboration to achieve concise and salient stakeholder platforms and participation. Stakeholder involvement and engagement must be done in a multifaceted approach that will be incorporative of all role players within the municipality or an organisation.

To uphold the principles of transparency and accountability in public administration, the Constitution of the Republic of South Africa emphasises stakeholder involvement in various aspects. These include intergovernmental relations section 41(c), basic values, and principles of Public Administration section 195(g), and conducting municipal business openly and transparently section 160(7).

Similarly, Section 19(1)(2) of the Municipal Structures Act further supports this constitutional provision by mandating that municipal councils develop community consultation mechanisms, regularly review community participation in decision-making processes, and ensure that community perspectives are considered during such processes.

The term ‘stakeholder paradigms" refers to different ways of perceiving and engaging with stakeholders in various contexts, such as business, management, or decision-making processes (Slabbert, 2022). A stakeholder is an individual or group who has an interest or is affected by a particular project or organisation, and several stakeholder paradigms have also been identified and studied (Slabbert, 2022). The study discusses several stakeholder paradigms and motivates the relevant stakeholder paradigm (Mahajan et al., 2023):

- The Shareholder Paradigm: The paradigm focuses primarily on the interests of shareholders, who are typically seen as the primary stakeholders in the business, in this case the municipality.
- Stakeholder Theory Paradigm (Freeman *et al*, 2010): This paradigm that businesses and organisations have a broader range of stakeholders beyond shareholders. It promotes the idea that organisations should consider the interests of all stakeholders, including employees, customers, suppliers, communities, and the environment, in their decision-making processes.
- Market-driven paradigm (Schaffmeister and Schaffmeister, 2015): This paradigm emphasises the role of markets in shaping stakeholder relationships. It suggests that organisations should market forces and customer demands to satisfy stakeholders and achieve success.
- Collaborative Paradigm (Van Tulder, 2011): This paradigm emphasises collaboration and cooperation between stakeholders. This encourages organisations to engage with stakeholders in a meaningful way. This involves including them in the decision-making process or in seeking input and feedback.
- Sustainability Paradigm (Harrington, 2016): This paradigm highlights the importance of considering the long-term impacts and sustainability of decision-making on all

stakeholders as well as the environment. It promotes a holistic approach that aims to balance the economic, social, and environmental factors.

- According to Bradford (2016), stakeholder relations consist of community engagement frameworks that are used to explain the levels of participant involvement, influence, and power. These frameworks are presented as ladders, continuums, or spectrums, contributing to a greater understanding of community engagement, consistency in implementation, and policy development. These are tools for eliciting a greater structure in the community engagement process.

2.1.3 Stakeholder Involvement and Engagement in Municipal Water Demand Management Strategies

As part of effective municipal water demand management, stakeholder involvement has been recognised as a crucial component because it enables the identification of stakeholders' interests and concerns, which can be taken into consideration when making decisions related to water management. According to Shabani *et al*. (2021), stakeholder involvement is essential for efficient waste management, and this can also be applied to municipal water demand management. To achieve effective stakeholder involvement, top management must map stakeholders and impel passive stakeholders to become active participants in decision-making processes.

The involvement and engagement of stakeholders can positively influence the ethics of top management, and it is important to map these stakeholders. This will enable passive stakeholders to become active participants in decision making related to water management. The theory of stakeholder legitimacy also highlights the importance of identifying groups that can consider public services (Biancone and Secinaro, 2016). In municipalities, stakeholders are interested in evaluating water services based on their respective areas. However, citizens are

among the most critical groups when considering stakeholder involvement as they hold great power through their voting rights (Biancone and Secinaro, 2016). Therefore, it is crucial for municipal water demand management to involve citizens actively in decision-making processes and consider their opinions and preferences.

Effective collaboration and communication with stakeholders are vital for successful municipal water demand management. By actively involving stakeholders in the decision-making processes and providing them with relevant information, municipalities can build trust and foster a sense of ownership among stakeholders. This may be achieved through public consultations, surveys, and feedback mechanisms (Weymouth *et al*., 2020). These methods provide stakeholders with opportunities to express their views, concerns, and preferences regarding water-management practices. They also allow stakeholders to contribute their expertise and local knowledge, which can be invaluable for developing effective water management strategies. Furthermore, stakeholder involvement can help to uncover potential conflicts or trade-offs that may arise from different interests and perspectives.

Several strategies can be employed to effectively engage stakeholders in municipal water-demand management. First, comprehensive stakeholder analysis should be conducted to identify and map the different stakeholders relevant to water management in the municipality (Lamers *et al*., 2010). This can involve identifying and categorising stakeholders based on their levels of interest, influence, and potential impact on water management decisions. Second, a clear communication plan should be developed to ensure that stakeholders are informed about decision-making processes and have access to relevant information (Lamers *et al*., 2010). This includes the provision of clear and concise information regarding water management objectives, challenges, and proposed strategies.

Assessing the impact of stakeholder engagement on water resource management is crucial for evaluating its effectiveness and identifying areas of improvement. This can be accomplished

through a variety of approaches, such as conducting surveys or interviews to obtain input from stakeholders regarding their engagement process experiences (Lacroix *et al*., 2016). Monitoring and evaluating the outcomes of water management decisions and assessing whether they align with stakeholders' interests and objectives can provide valuable insights into the effectiveness of stakeholder involvement.

Incorporating stakeholder feedback into municipal water policies is essential for ensuring the legitimacy and effectiveness of water policies. This allows for inclusivity and a participatory decision-making process as stakeholders can provide input and insights that may not be captured through traditional top-down approaches (Stosch *et al*., 2017). By actively involving stakeholders such as community members, water users, industry representatives, environmental organisations, and local government officials in the development and implementation of water policies, the resulting policies are more likely to address the diverse needs and interests of all stakeholders involved.

Case studies showed that successful stakeholder engagement in water management can lead to improved governance, more effective and sustainable water resource management, and enhanced community resilience to water-related challenges. For example, in the case of the Murray-Darling Basin in Australia, stakeholders including farmers, environmental groups, indigenous communities, and government agencies were involved in the development of a comprehensive water management plan (Martin *et al*., 2022). This inclusive approach results in a better understanding and consideration of the diverse perspectives and interests of stakeholders, leading to more balanced and equitable water allocation decisions. Additionally, a case study conducted in the Netherlands demonstrated the positive outcomes of stakeholder involvement in water management (Gravergaard et al., 2017). In this case, stakeholders, such as water users and local communities, were actively engaged in the design and implementation of flood management strategies. Their input was crucial in shaping strategies to be more

compatible with local needs and preferences, leading to greater acceptance and support from stakeholders (Gravergaard et al., 2017).

In the context of sustainable water supply management, stakeholder engagement plays a crucial role in ensuring that decisions and actions taken are inclusive, fair, and representative of all relevant stakeholders (Langsdale *et al*., 2022). This can be achieved through various mechanisms, such as public consultations, surveys, and feedback mechanisms, which provide opportunities for stakeholders to express their views and contribute their expertise to the decision-making process. By involving stakeholders, water supply management strategies can benefit from diverse perspectives and expertise, leading to more comprehensive and effective solutions. Furthermore, stakeholder engagement fosters a sense of ownership and commitment among stakeholders, as they feel that the decision-making process considers their opinions and inputs. To achieve effective stakeholder engagement in municipal water demand management strategies, it is important to identify and involve relevant stakeholders in the decision-making process (Verkerk *et al*., 2017). This can be achieved by conducting stakeholder analyses to identify and categorise stakeholders based on their level of interest, influence, and potential impact on water management policies and decisions. Additionally, it is crucial to develop a clear communication plan that ensures that stakeholders are well-informed about the decision-making processes and have access to relevant information (Verkerk *et al*., 2017). Moreover, stakeholder engagement should extend beyond simply informing stakeholders and seeking input. It should also include mechanisms for collaboration and co-creation, in which stakeholders actively participate in the development of strategies and solutions. This can be achieved through collaborative workshops, working groups, or joint decision-making (Deffner *et at*., 2022). Overall, stakeholder engagement in municipal water demand management strategies is essential for ensuring that decisions are informed, inclusive, and sustainable.

In the context of municipal water demand management strategies, multi-stakeholder partnerships offer both complexity and opportunities. The involvement of multiple stakeholders with diverse interests and perspectives can make decision-making processes more complex and challenging. On the other hand, multi-stakeholder partnerships also present opportunities for shared learning, collaboration, and innovation. By bringing together stakeholders from various sectors such as government agencies, water utilities, community organisations, and residents, multi-stakeholder partnerships can tap into a wide range of knowledge, expertise, and resources (Thaler *et al*., 2021). This can lead to more comprehensive and integrated solutions that address the diverse needs and priorities of stakeholders. Stakeholder involvement is a continuous process that requires constant contact and collaboration. This ensures that stakeholders remain engaged and have opportunities to provide input and feedback throughout the implementation of the water demand management strategies.

Equitable engagement of stakeholders determined by their respective fields of interest, knowledge, and possible involvement may assist in sustainability; if the partnership can address stakeholders' needs and expectations while addressing water demand management needs, the partnership will be stronger and mutual accountability will be strengthened (Pathak *et al*., 2022).

In the realm of water resource management, establishing a multi-stakeholder platform can be a critical approach for facilitating stakeholders' participation in the sustainable utilisation and management of water resources. However, it is important to critically analyse the dynamics of stakeholder participation within such platforms and ensure that all relevant stakeholders are effectively engaged.

This includes considering factors such as power imbalances, the inclusion of marginalised groups, and ensuring equitable representation (Bennett *et al*., 2018). Additionally, stakeholder

engagement in municipal water demand management strategies should go beyond simply informing stakeholders of the decisions made by governing bodies. It should involve active participation, in which stakeholders can contribute their perspectives, knowledge, and expertise to the decision-making process. By involving stakeholders in policymaking, water resource managers can gain a better understanding of the diverse needs and interests of different groups, leading to informed and inclusive decision-making processes (Stosch *et al*., 2017).

Stakeholder engagement in municipal water demand management strategies should involve capacity-building initiatives (Thungngern *et al*., 2015). These initiatives can provide stakeholders with the knowledge, skills, and resources necessary to participate actively in decision-making processes and contribute to the implementation of water demand management strategies.

By actively involving stakeholders in the decision-making process and providing them with opportunities for meaningful participation, water resource managers can ensure that strategies are not only responsive to the diverse needs and interests of different stakeholders, but also promote sustainable water resource management (Thungngern *et al*., 2015). Stakeholder engagement in municipal water demand management strategies is crucial to achieve sustainable and inclusive water resource management. The involvement and engagement of stakeholders in the decision-making process is essential to ensure that water management strategies are effective and sustainable. An approach for reaching out to upper management in institutions might help attract interest. High-level steering groups are worth pursuing. According to Pathak *et al*., creating a private sector-focused organisation might also aid in scoping out specific topics of concern and striving for management-level participation, as the 2030 WRG demonstrated in its early engagement in Tanzania. (Pathak *et al*., 2022)

Effective stakeholder involvement and engagement in municipal water demand management strategies are crucial to achieve sustainable and inclusive water resource management.

Furthermore, stakeholders' engagement in the decision-making process fosters transparency and accountability, as it allows for an open dialogue in which decisions can be challenged and improved through collaborative efforts.

Virtual stakeholder engagement allows stakeholders to be involved in transboundary water management processes through online platforms and tools. As water scarcity is a complex challenge in transboundary basins with competing upstream-downstream demands, designing a transboundary (virtual) structure requires common interests from which each country can benefit (Kristin *et al*., 2022). This strategy can overcome geographical boundaries and allow a broader range of stakeholders to participate, including those who may be unable to attend in-person meetings because of distance or other restrictions. Virtual stakeholder engagement can facilitate the exchange of knowledge and information between stakeholders, thereby enhancing their understanding of the complexities and challenges associated with transboundary water management (Quinn *et al*., 2022).

However, virtual stakeholder engagement presents both challenges and limitations. These include the need for reliable internet access and technological infrastructure, ensuring equal participation and representation of all stakeholders in virtual platforms, and addressing potential issues related to privacy and data security (Kristen *et al*., 2022). Furthermore, virtual stakeholder engagement may not fully capture the nuances and dynamics of in-person interactions such as non-verbal communication and interpersonal relationships. Therefore, while virtual stakeholder engagement can be a valuable tool for transboundary water management, it should be complemented by in-person interactions whenever possible to ensure the richness and depth of stakeholder engagement.

2.1.4 Importance and necessity of stakeholder engagement

The importance and necessity of stakeholder engagement in municipal water-demand management strategies cannot be overstated. Stakeholder engagement plays a crucial role in ensuring the success and sustainability of water-demand management strategies at the municipal level. Engaging stakeholders in the decision-making process fosters transparency and accountability as it allows for an open dialogue in which decisions can be challenged and improved through collaborative efforts (Lazo-Porras *et al*., 2020). Stakeholder involvement also enhances the legitimacy and acceptance of water demand management strategies as it gives stakeholders a sense of ownership and empowerment. Studies illustrate that the involvement of top management is also crucial for compliance and sustainable implementation; therefore, everyone in the organisation must be on board and willing to commit (Häberlein and Hövel, 2023).

Additionally, stakeholder engagement in municipal water demand management strategies can provide valuable insights and perspectives that may not be apparent to decision makers alone (Li *et al*., 2019). Municipalities may tap into a wealth of information and expertise by incorporating a variety of stakeholders, including community members, local companies, non-profit organisations, and government agencies, ensuring that the plans generated are thorough and successful. Moreover, stakeholder engagement promotes social equity by ensuring that the needs and concerns of all members of society are considered (Bates 2017). This is particularly important in the context of water demand management because access to clean and reliable water is a basic human right. Thus, stakeholder engagement is not only a necessary step in formulating effective municipal water demand management strategies but also a moral imperative to ensure the well-being and equitable treatment of all individuals and communities affected by these strategies.

Understanding the success of stakeholder engagement initiatives and identifying areas for improvement requires assessing public participation in Water Conservation Water Demand

Management (WC/WDM) in water-stressed metropolitan regions (Winmore *et al*., 2018). According to research, a lack of water user engagement would perpetuate water conservation and demand management issues in the city of Gweru, and it is thus advised that active participation channels be developed to realise sustainable water utilisation and service delivery (Winmore *et al*., 2018). By evaluating the level of public participation, municipalities can gauge the extent to which stakeholders are involved in decision-making processes, and whether their input is adequately considered and integrated into the development and implementation of water demand management strategies. Assessing public participation can help identify barriers to stakeholder involvement, such as lack of awareness or understanding, limited access to information, and power imbalances that hinder certain groups from participating fully (Prlić *et al*., 2017). By conducting rigorous assessments of public participation, municipalities can identify and develop targeted interventions to overcome these barriers, thereby promoting more inclusive and equitable stakeholder engagement strategies. Moreover, evaluating public participation allows for the identification of best practices and successful approaches to stakeholder engagement in water demand management. Through such assessments, municipalities can learn from successful cases and replicate effective strategies in other areas.

2.1.5 Different stakeholders within a municipal setting

In the municipal environment, stakeholders refer to individuals, groups, or organisations that are affected by policies, decisions, and services provided by a local government or municipality. These stakeholders play crucial roles in the implementation and outcomes of municipal projects and initiatives.

Some common stakeholders within the municipal environment include the following:

- Residents: The residents of a municipality are key stakeholders as they are directly affected by the decisions and services provided by the local government. They have a

stake in various aspects such as community development, infrastructure, public safety, and environmental sustainability.

- Businesses: Local businesses within a municipality are important stakeholders as they contribute to the economic growth and vitality of the community. They are affected by factors such as zoning regulations, business permits, infrastructure investments, and the overall business environment.
- Community organisations: Non-profit organisations, community groups, and advocacy organisations play a significant role in the municipal environment. They represent specific interests and issues within the community, and often collaborate with the local government to address the community and advocate for change.
- Government agencies: Various government agencies, such as state or federal agencies, may influence municipal affairs. These agencies often work in partnership with local governments to implement policies, provide funding, or enforce regulations.
- Elected officials: Municipal stakeholders also include elected officials such as mayors, council members, or commissioners. They are responsible for decisions on behalf of the community and serve as representatives of their constituents.
- Employees and unions: Municipal employees and their unions are important stakeholders, as they provide essential services to the community and contribute to the functioning of the local government. Their perspectives and working conditions are important considerations for municipal decision making.

It is further emphasised that the overall roles of municipal stakeholders are interconnected and contribute to the effective functioning and development of the municipality. Collaboration and engagement among stakeholders are essential for achieving a sustainable and inclusive community.

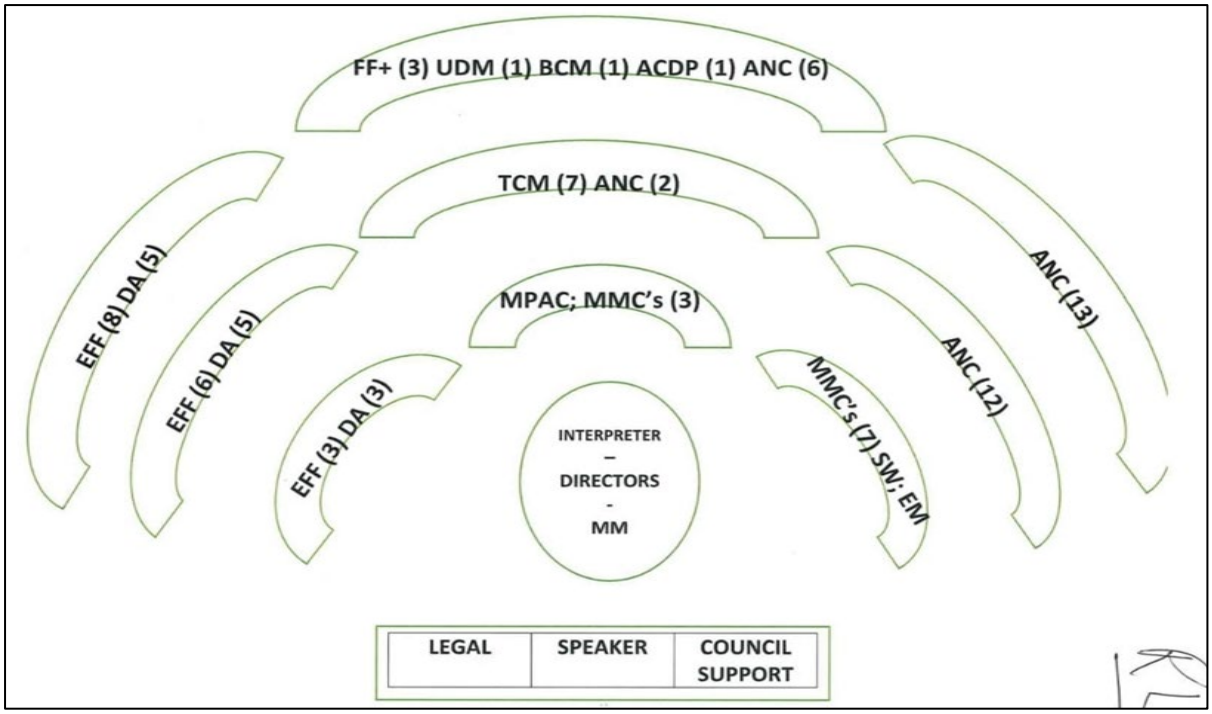

Figure 4: Municipal Council Structure

2.1.6 Stakeholder roles within the municipality

Within the Rustenburg Local Municipality, several stakeholders play important roles in the development of the municipality. Some key stakeholders include the following:

- Residents: Rustenburg residents are the primary stakeholders in the municipality. They are directly affected by the decisions and actions of municipalities. Residents have a stake in the provision of basic services, infrastructure development, safety, and the overall quality of life in the municipality.
- Local businesses: Local businesses are crucial stakeholder groups in the Rustenburg Local Municipality. They contribute to the economic growth and employment opportunities within municipalities. Business owners have a vested interest in the municipality's policies and regulations, which can directly affect their operations and profitability.

- Community organisations: Various community organisations, such as nonprofit organisations, neighbourhood associations, and interest groups, play an essential role in representing and addressing the needs and concerns of specific segments of the Rustenburg community. These organisations serve as the voices of different communities and help ensure that their interests are heard and addressed by the municipality.
- Government agencies: Different government agencies, including provincial and national departments, are stakeholders in the Rustenburg Local Municipality. These agencies work alongside the municipality to provide support, guidance, and resources for various initiatives and service deliveries. They share the responsibility of collaborating and coordinating efforts to ensure effective governance and developmental outcomes.
- Traditional leaders: In many South African municipalities, including Rustenburg, traditional leaders have significant influence and play important roles within local governance structures. They represent and provide guidance to their respective communities, contribute to decision-making processes, and ensure that traditional values and customs are respected and integrated into municipal operations. The Royal Bafokeng Nation (RBN) is the biggest traditional administration with the Rustenburg Local Municipality.
- Civil society organisations: Civil society organisations, including environmental groups, human rights organisations, and community development organisations, are stakeholders that work alongside the municipality to address social, environmental, and developmental issues within the Rustenburg Local Municipality. These organisations often provide advocacy, expertise, and resources to support community development initiatives.

- Municipal officials and employees: The municipality's officials and employees, including the municipal manager, councillors, and administrative staff, have a direct responsibility to ensure effective governance, service delivery, and policy implementation within the Rustenburg municipality. They are accountable to the residents and other stakeholders for the municipality's performance and are responsible for managing the municipality's affairs daily.

These stakeholders play vital roles in shaping the direction and development of the Rustenburg municipality. Collaboration and effective engagement among these groups are crucial for addressing the diverse needs and aspirations of the municipality's residents and for achieving sustainable growth and development.

2.1.7 Stakeholder Participation within the Municipality

Engaging stakeholders in decision-making within an organization involves sharing information, engaging in dialogue, and establishing a sense of mutual responsibility. This is a crucial element of stakeholder engagement (Osobajo *et al*., 2021). According to Khoza (2015), the theory of stakeholder relationship management is about "effectively managing organizational-public relationships around common interests and shared goals, over time, resulting in mutual understanding and benefit for interacting organizations' publics". The reliability of stakeholder involvement has proven that stakeholder engagement and participation play critical roles in policy development and strategic planning. Communication is considered a means of intensifying stakeholders' legitimacy and urgency (Nguyen *et al*., 2018). The role of the municipality is to enhance relations instead of merely identifying stakeholders; this implies creating relationships with them (Khoza, 2015).

Donaldson and Preston (1995) summarise the four central theses of stakeholder theory as follows:

Hypothesis 1: The stakeholder theory provides a descriptive perspective on corporations. It presents a model that portrays corporations as entities consisting of both cooperative and competitive interests, each with their own inherent value. The model can also be used to analyze empirical claims and make instrumental predictions related to the stakeholder concept, although it is not intended for evaluating the normative aspects of the concept.

Hypothesis 2: According to Donaldson and Preston, stakeholder theory serves as a framework for analyzing the relationship between stakeholder management and achieving corporate performance goals. It suggests that companies that prioritize stakeholder management are more likely to experience success in terms of profitability, stability, and growth.

Hypothesis 3: While the fundamental basis of stakeholder theory is normative, there are two significant aspects that should be acknowledged: stakeholders encompass individuals or groups with legitimate interests in both procedural and substantive facets of corporate operations. Stakeholders are distinguished by their interests in the corporation and whether those align with the functional objectives of the corporation itself. The intrinsic value lies within each group of stakeholders' respective concerns; meaning that every group's interests deserve to be taken into consideration on their own merits, rather than solely because they can contribute to the advancement of other groups, such as shareholders.

Hypothesis 4: Stakeholder theory has a broad managerial scope. It goes beyond describing current situations or predicting cause-effect relationships and instead provides recommendations for attitudes, structures, and practices that make up stakeholder management. Effective stakeholder management involves considering the legitimate interests of all relevant stakeholders in establishing organizational structures, general policies, and making decisions on a case-by-case basis.

2.1.8 Stakeholder Platforms and Decision making

There are three primary reasons why municipalities engage in consultation and negotiation with stakeholders. It is the responsibility of all South Africans to contribute towards building a better life for everyone. Therefore, national, provincial, and local governments should actively engage with the public regarding their programs and encourage participation in socioeconomic transformation (Treasury, 2008). Once key stakeholders have been identified, it becomes necessary to determine effective communication and negotiation strategies that can be utilized during consultations. Firstly, consultations serve to aid municipalities in making informed decisions. Secondly, they facilitate better understanding among different stakeholders about trade-offs and priorities faced by municipalities when making decisions. Lastly, consultation efforts can help enhance inter-departmental and intergovernmental collaboration, which is crucial for efficient service delivery (Treasury, 2008).

The local government plays a vital role in managing the basic facilities required for the day-to-day living of a community. To effectively pursue collective goals, it is necessary to engage in consultation with the community and other stakeholder groups. Without proper consultation, municipalities may prioritize incorrectly and remain unaware of what people truly need. In situations like this, there is a high likelihood that the actual needs of people will not be fulfilled. Additionally, municipalities have limited resources and cannot address all necessary tasks. Therefore, choices must be made considering the scarcity of resources. To make well-informed decisions, it is crucial to gather information from those who receive municipal services as they are in the best position to provide relevant input. Consistent and formalized communication along with negotiations with stakeholders play a vital role in ensuring efficient service delivery (Treasury, 2008).

Another reason for engaging in consultation is to foster better understanding and garner support from various stakeholders regarding the trade-offs and prioritization involved in municipal decision-making. In South Africa, considering the significant diversity among residents within

each municipality becomes essential. Given the historical context, there exists a substantial disparity in wealth and services across different sectors of every community. Thus, it is crucial to consult with all segments of society to gain an accurate understanding of their needs and priorities. This ensures that decision-making processes take into account everyone's concerns (Treasury, 2008).

This brings us to the second reason for consultation, which is to help different stakeholders better understand and support the decisions around trade-offs and prioritisation that municipalities must make. In South Africa, there is great diversity among residents in every municipal area of the country, which must be considered. As a result of our history, there exists an extremely wide wealth and services gap between the sectors of each community, which must be considered when organising and supplying services to the community. All parts of the community must be consulted for the municipality to properly understand their needs and priorities and to provide a sense that everyone's priorities are at least considered in the decision-making processes that follows (Treasury, 2008).

Within the municipal setting, there are different types of stakeholder engagement platforms, each having different objectives and mission, and oversees the decisions implemented by stakeholders on different levels of stakeholder engagement. The municipal council acts as the board for all affairs relating to the work and relations of the municipality. Below are the different levels of stakeholder engagement within the Rustenburg municipality.

2.1.8.1 Municipal Council

The municipal council consists of elected representatives from various wards in the Rustenburg Local Municipality. As stated in principle six of King Code 1V, the role of the municipal council is to act as a central point and ensure effective corporate governance within the municipality. According to Section 2 of the Municipal Systems Act 32 of 2000, a municipality

is a government body at the local level that holds legislative and executive power within its designated jurisdiction.

The municipality council in South Africa holds legislative and executive authority according to Section 151 of the Constitution. This authority allows them to govern, collect levies and taxes for services such as electricity, water, sanitation, etc., within their jurisdiction. The governance of municipalities should be seen in the context of collaborative governance while retaining municipal autonomy.

2.1.8.2 Ward Councillors

Ward Councillors are public representatives within a municipality elected by communities, and the sole duties of Councillors are to represent the community within the Municipal Council by communicating their needs and access to resources within the jurisdiction of the municipality.

2.1.8.3 Kgosana (Traditional Council Members)

Kgosana representatives are typically councilors who represent the community within the jurisdiction of the tribal authority. The specific role and responsibilities of the municipal ward councilor are not clearly defined. Having a municipal Ward Councilor highlights the conflict surrounding informal settlements and between the Royal Bafokeng Nation and Rustenburg Local Municipality (Cannon *et al*., 2010).

2.1.8.4 Communities

Communities' compromises of population registered within the jurisdiction of the municipality, in this case the Rustenburg Local Municipality Community. The composition of the community within a municipal environment is dissected in the form of ward delamination that separates the geographical setting of a municipality into wards. The community has the right to elect a councillor who is identified as a community leader that will resume duties of advancing the interest of the community in the municipality.

2.1.8.5 Traditional Council

Traditional councils are constituted by the Traditional Affairs Act and all fall under the South African government; reporting and management lies within the local and provincial spheres of government. The Traditional Council constitutes the king and sub-kings from different villages within the Traditional Council Jurisdiction. In the case of the Rustenburg Local Municipality, the Royal Bafokeng Nation is related to Rustenburg by means of jurisdiction. In the study conducted by Cannon et al., (2010) it was found that the Bafokeng people viewed the MOU as a formal agreement for cooperation between various entities including the Royal Bafokeng Administration, Rustenburg Local Municipality, and Bojanala District Municipality. The main objective of this memorandum was to enhance communication and consultation among these parties in order to provide improved services to the communities. This collaboration aligned with constitutional principles such as intergovernmental relations and relevant acts like Northwest Traditional Leadership and Governance Act, 2 of 2005, and Local Government: Municipal Systems Act No.32 of 2000 as amended.

2.1.8.6 Industries

The Rustenburg Local Municipality is a diverse region in South Africa, with several industries contributing to its economy. Some of the key industries within the Rustenburg Local Municipality are as follows (RLM IDP 2022-2027, 2022):

- Mining: Rustenburg is known for its rich mineral resources, particularly Platinum. The region is home to numerous mining operations, including those of platinum, chromium, and other precious metals. Mining plays a significant role in the local economy by providing employment opportunities.
- Manufacturing: The Municipality has a growing manufacturing sector that includes the production of automotive components, chemicals, plastics, and metal products.

Manufacturing companies in Rustenburg contribute to the local economy by producing goods for domestic consumption and export.

- Construction and engineering: With ongoing infrastructure development in the area, the construction and engineering industry is thriving in Rustenburg. Construction firms undertake various projects such as building, road development, and infrastructure upgrades, contributing to the growth of the municipality.
- The tourism industry includes accommodations, such as hotels, lodges, guesthouses, restaurants, tour operators, and recreational activities, such as game reserves, nature trails, and cultural sites.
- Agribusiness: As mentioned earlier, Rustenburg has a significant presence in the agricultural sector. Crop farming, livestock farming, fruit orchards, and agro processing contribute to food production and provide employment opportunities for the local population.
- Retail and wholesale trade: Rustenburg has a developed retail sector, including shopping malls, supermarkets, and specialty stores that cater to the needs of the residents, supplying goods to businesses in the municipality and neighbouring regions.
- Health and medical services: The municipality has several healthcare facilities, including hospitals, clinics, and specialised medical centres. Health and medical services contribute to the local population's well-being and provide employment opportunities.
- Education and training: Rustenburg has educational institutions such as schools and vocational training centres. The education sector plays a vital role in providing knowledge and skills to the local population and contributes to human capital development.

- Professional services: The municipality has banks, insurance companies, firms, legal services, and consulting agencies that provide financial and professional services to individuals and businesses in the area.

2.1.8.7 Agriculture

The Rustenburg Local Municipality, located in the Northwest Province of South Africa, has agricultural activities due to its favourable climate and fertile land. Some agricultural activities were found within the Rustenburg Local Municipality (RLM IDP 2022-2027, 2022):

- Crop farming: Farmers in Rustenburg cultivate various crops, including maize (corn), wheat, sunflowers, and vegetables, such as potatoes, tomatoes, and carrots. These crops are grown for local and commercial purposes.
- Livestock farming: Livestock farming is prominent in Rustenburg. Farmers raise cattle, sheep, goats, and poultry for meat, milk, wool, and egg production. Livestock farming contributes to the local economy and provides an income source for many residents.
- Fruit orchards: Rustenburg is known for its fruit, particularly citrus fruits, such as oranges, lemons, and grapefruits. These orchards are cultivated for domestic consumption and commercial export to various markets.
- Dairy farming: The municipality has dairy farms that produce milk, cheese, and other dairy products. These farms play a significant role in local demand for dairy products.
- Beekeeping: Beekeeping and honey production are prevalent in Rustenburg. Honey production not only provides a sweet product but also plays a vital role in pollination and ecosystem balance.

- Aquaculture: Fish farming and aquaculture are gaining popularity in Rustenburg. Tilapia and catfish are commonly bred in fishponds, providing a source of fresh fish for local markets.
- Horticulture and floriculture: Rustenburg has a thriving horticulture industry, with flower and plant nurseries. Flowers such as roses, chrysanthemums, and carnations are grown for the local market and export.
- Agro-processing: Along with farming activities, there are agro-processing facilities within Rustenburg that process agricultural products into value-added items such as jams, sauces, pickles, and processed meat products.

2.1.8.8 Mines

The Rustenburg Local Municipality is in the Northwest Province of South Africa and is known to be a major mining region. Some of the significant mines within the Rustenburg Local Municipality are as follows (IDP 2022-2027, 2022):

- Impala Platinum Mines: Impala Platinum Holdings operates several mines in Rustenburg, including the Impala Platinum Mine, which is one of the largest platinum mines in the world. This mine produces platinum, palladium, rhodium, and other precious metals.
- Lonmin Marikana Mines: Lonmin, now owned by Sibanye-Stillwater, operates Marikana Mines in Rustenburg. These mines primarily focus on platinum group metals, including platinum, palladium, and rhodium.
- Royal Bafokeng Platinum Mines: The Royal Bafokeng Platinum operates the Bafokeng Rasimone Platinum Mine (BRPM) and Styldrift Mine in Rustenburg. These mines produce Pt, Pd, Rh, and Au. Anglo American Platinum Mines: Anglo American

Platinum has various mining operations in Rustenburg, including the two largest mines being Bathopele Mine and Khomanani Mine. These mines produce platinum and other platinum-group metals.

- Sibanye-Stillwater Kroondal Mine: Sibanye-Stillwater operates on the Kroondal Mine, which is situated near Rustenburg. These catalysts produce platinum, palladium, and rhodium.
- The Northam Platinum Zondereinde Mine: Located in the vicinity of Rustenburg, the Zondereinde Mine is operated by Northam Platinum. It is one of the deepest platinum mines in the world and produces platinum, palladium, rhodium, and gold.
- Tharisa Mining is situated near the town of Marikana within the Rustenburg Local Municipality. It is an open-pit chrome and platinum group metal mine that produces a chrome concentrate, platinum, and palladium.

2.1.9 Communication within the Stakeholder forum and Engagement

It is likely that there will be minimal opposition to the establishment of a network consisting of various parties involved in order to generate public value. However, ensuring that all stakeholders allocate their resources towards this shared public value may necessitate persuasive and authoritative involvement. (Haarhoff, 2019). In a stakeholder environment, effective communication channels are used for transparent and productive interactions between stakeholders. According to Bradford (2016), the concept of stakeholder relations encompasses community engagement frameworks that provide explanations for the various levels of participant involvement, influence, and power. These frameworks are often depicted as ladders, continuums, or spectrums to enhance our understanding of community engagement and ensure consistency in implementation and policy development. Effective stakeholder engagement is crucial for the successful implementation of policies and strategies aimed at improving service

delivery in a diverse municipal environment. Involving stakeholders from various organizations in decision-making processes through sharing information, promoting dialogue, and fostering mutual responsibility is an essential element of engaging with stakeholders (Osobajo *et al*., 2021). Some common communication channels that can be utilised within a multifaceted environment are as follows:

- Meetings: Face-to-face meetings provide opportunities for stakeholders to gather and discuss important matters. These can include regular stakeholder, town hall, and project-specific meetings. Meetings allow for direct interaction, open dialogue, and exchange of ideas.
- Emails: Emails are commonly used for formal communication in a stakeholder environment. They allow for the sharing of information, updates, and documents. Emails provide a written record of communication and can simultaneously reach a larger group of stakeholders.
- Newsletters: Newsletters are useful communication tools for providing updates and sharing relevant information with stakeholders. They can be distributed via email or in print. Newsletters help keep stakeholders informed of ongoing projects, achievements, and upcoming events.
- Social media platforms such as Twitter, Facebook, LinkedIn, or dedicated stakeholder engagement platforms can be utilised to engage stakeholders and disseminate information. They provide space for stakeholders to interact, ask questions, and provide feedback. Social media platforms can also be used for targeted campaigns to raise awareness.
- Websites and intranets: A dedicated website or intranet can serve as a central information hub for stakeholders. It can provide updates, project documentation,

progress reports, and other relevant resources. Websites and intranets allow stakeholders to conveniently access information.

- Presentations and workshops: Presentations and workshops provide an opportunity for stakeholders to learn and discuss specific topics in depth. These can be conducted in person or online, and foster engagement and collaboration among stakeholders.
- Media relations: Media relations involve communicating with the media to share information about projects, milestones, or significant developments. Press releases, media, and interviews can be used to reach broader audiences and increase public awareness.
- Focus groups and consultations: Focus groups and consultations involve gathering a selected group of the population to gather insights and feedback on specific topics. These sessions provide a more intimate setting for stakeholders to share their perspectives and participate in decision making.
- One-on-one meetings: In some cases, one-on-one meetings with individual stakeholders may be necessary to address specific concerns or to build relationships. These meetings can be conducted in person or virtually and provide an opportunity for personalised communication and address specific needs.

It is important to determine the appropriate communication channels based on stakeholders' preferences and needs. A combination of these channels can help create an environment of open communication, fostering collaboration and understanding within a stakeholder environment that can enhance service delivery within a municipality such as the Rustenburg Local Municipality.

2.1.10 Communication Matrix

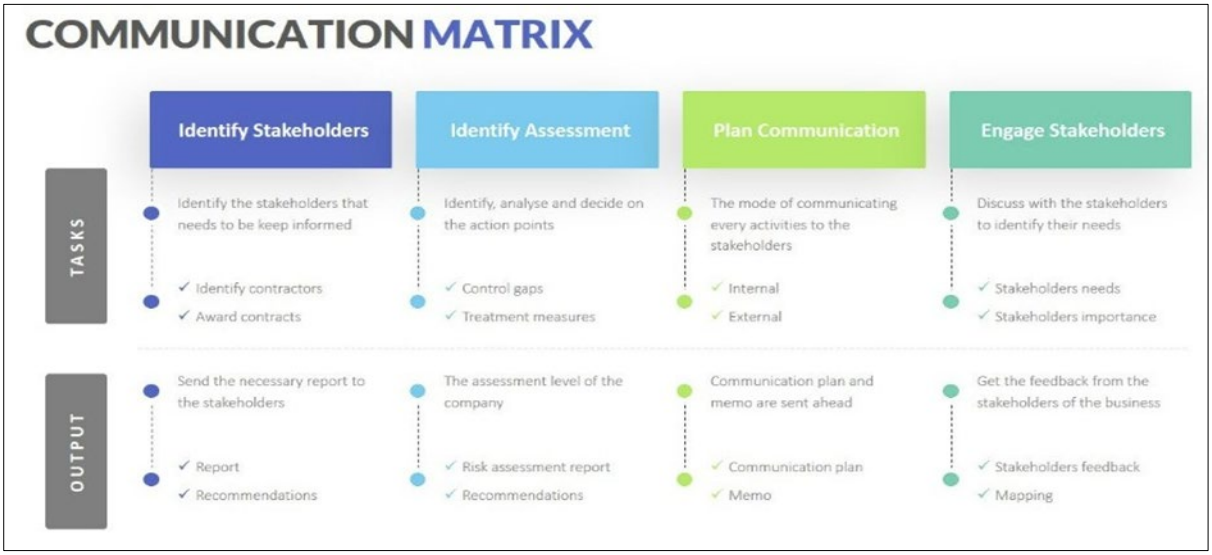

Figure 5: Communication Matrix (Powerslides.com, 2023)

The King III Report on Governance is composed of eight chapters, and Chapter 8 focuses on 'Governing Stakeholder Relationships.' This chapter presents six principles that intend to establish a basis for managing stakeholder relationships in South Africa. These principles pertain to stakeholders' connection with reputation, proactive management of stakeholder relationships, engagement with stakeholders, treatment of stakeholders, transparent and effective communication with stakeholders, as well as resolving disputes and conflicts involving stakeholders.

According to Haarhoff (2019), municipal councils are accountable for delivering municipal services in a manner that promotes sustainability, equity, efficiency, effectiveness, affordability and aligns with the principles of service delivery outlined in the Constitution. This encompasses generating public value that corresponds to the public interest or 'the common good'. Additionally, it is recognized that involving stakeholders and incorporating their participation within decision-making processes constitutes good governance. Haarhoff (2019)

further highlighted that the involvement of stakeholders is a crucial aspect in public value theory, acknowledging the transition from power and market dynamics to civil society.

2.2 IMPORTANCE OF STAKEHOLDER INVOLVEMENT IN WATER CONSERVATION WATER DEMAND MANAGEMENT STRATEGIES

2.2.1 Stakeholder Involvement in Water Conservation and Demand Management

2.2.1.1 Understanding Stakeholder Involvement in Water Conservation

Effective and sustainable water resource management requires stakeholder participation and involvement. Stakeholder involvement plays a crucial role in water conservation and demand management strategies. It is widely recognised that stakeholder participation is essential for effective and sustainable water resource management efforts. Stakeholders, including community members, government agencies, non-governmental organisations, and businesses, have a vested interest in water resources and can greatly contribute to the success of water conservation initiatives (Alfredo *et al*., 2016). A key reason why stakeholder involvement is important in water conservation and demand management strategies is that it allows for a more comprehensive understanding of the impacts of water use and the potential mitigation options on available water supply. By engaging stakeholders in the decision-making process, water providers can gain valuable insights and perspectives that can inform policy decisions and shape effective conservation strategies (Salarian *et al*., 2019). Moreover, stakeholder involvement fosters a sense of ownership and responsibility among community members towards water resources. Furthermore, stakeholder involvement facilitates the development of collaborative approaches to water management. This collaboration can lead to greater cooperation and coordination among stakeholders, allowing for more effective and efficient water conservation efforts. (Kehrein *et al*., 2020)

Achieving effective and sustainable water resource management necessitates the participation and involvement of stakeholders. In the pursuit of water conservation and demand management strategies, stakeholder involvement is crucial. It has been widely acknowledged that stakeholder participation is vital to the success of efforts towards sustainable water resource management. Stakeholders, comprising community members, government agencies, non-governmental organisations, and businesses, have a vested interest in water resources and can significantly contribute to the success of water conservation initiatives. Stakeholder involvement is particularly important in water conservation and demand management strategies as it permits a more comprehensive understanding of the impacts of water use and the potential options for mitigating the effects on the available water supply. By involving stakeholders in the decision-making process, water providers can obtain valuable insights and perspectives that can inform policy decisions and shape effective conservation strategies. Additionally, stakeholder involvement fosters a sense of ownership and responsibility among community members towards water resources. Furthermore, stakeholder involvement facilitates the development of collaborative approaches to water management, leading to greater cooperation and coordination among stakeholders, which allows for more effective and efficient water conservation efforts.

2.2.1.2 Stakeholder Involvement in Water Conservation: Lessons from Case Studies

The importance of stakeholder involvement in water conservation and demand management strategies is evident in various case studies around the world.

For example, in Tucson, Arizona, stakeholder engagement played a crucial role in gaining support for potable reuse (Maliva *et al*., 2021). Through active involvement of stakeholders, Tucson was able to address concerns and misconceptions about potable reuse and build trust in the community. As a result, the implementation of potable reuse was successful and contributed to water conservation efforts in the region.

Similarly, in Uzbekistan and Tanzania, stakeholder participation was identified as a key component of integrated water resource management planning (Alfredo *et al*., 2016). In Uzbekistan, stakeholder involvement was crucial for the successful and sustainable management of water resources. It allowed for a better understanding of local needs and priorities, leading to more effective water resource management initiatives. In Tanzania, stakeholder participation was found to be essential for successful water resource management efforts. It led to increased satisfaction among residents, equal access to water resources, and time savings in rural water supply projects. These case studies highlight the positive outcomes that can be achieved through stakeholder involvement in water conservation. Stakeholder involvement in water conservation and demand management strategies is important for several reasons (Maliva *et al*., 2021). Firstly, stakeholders bring diverse perspectives and knowledge to the table. Their input can help identify innovative solutions and uncover potential challenges that may have been overlooked by water management professionals. Additionally, stakeholder involvement fosters a sense of ownership and accountability among the community. By actively involving stakeholders in decision-making processes, they become invested in the outcomes and are more likely to support and participate in water conservation efforts.

Moreover, stakeholders often have valuable local knowledge and expertise that can greatly contribute to the effectiveness and sustainability of water conservation initiatives. They have a deep understanding of the local context, including cultural norms, water use practices, and environmental factors.

This knowledge can inform the development of targeted and tailored strategies that are more likely to resonate with the community and lead to behaviour change. Furthermore, stakeholders play a critical role in building public support and trust for water conservation measures. Their involvement helps ensure that decisions and regulations are perceived as fair and legitimate, increasing compliance and cooperation from the community. Another important factor is the

shared responsibility for water resources. Stakeholder involvement in water conservation helps to foster a sense of shared responsibility for the management and preservation of water resources. This shared responsibility can encourage cooperation and collaboration among different stakeholders, leading to more effective and sustainable water management practices. In conclusion, stakeholder involvement in water conservation and demand management strategies is crucial for several reasons.

2.2.2 Role of Stakeholders in Water Demand Management Strategy

Stakeholders play a crucial role in the development and implementation of water demand management strategies. Their involvement is essential for several reasons. Firstly, stakeholders bring diverse perspectives and knowledge to the table. They can provide insights into the local context, including cultural norms, water use practices, and environmental factors (Quinn., 2020). This local knowledge can inform the development of targeted and tailored strategies that are more likely to be effective in promoting water conservation and behaviour change. Additionally, stakeholders often have a vested interest in the success of water demand management strategies.

This vested interest can motivate them to actively participate and contribute their expertise, resources, and support to the development and implementation of these strategies. Furthermore, stakeholders play a critical role in building public support and trust for water conservation measures. Their involvement helps ensure that decisions and regulations are perceived as fair and legitimate, increasing compliance and cooperation from the community. For example, when communities see those stakeholders, such as local businesses or community organisations, are actively involved in the development and implementation of water conservation measures, they are more likely to trust and support these measures.

2.2.3 Impacts of Stakeholder Participation in Water Conservation Water Demand Management Strategy

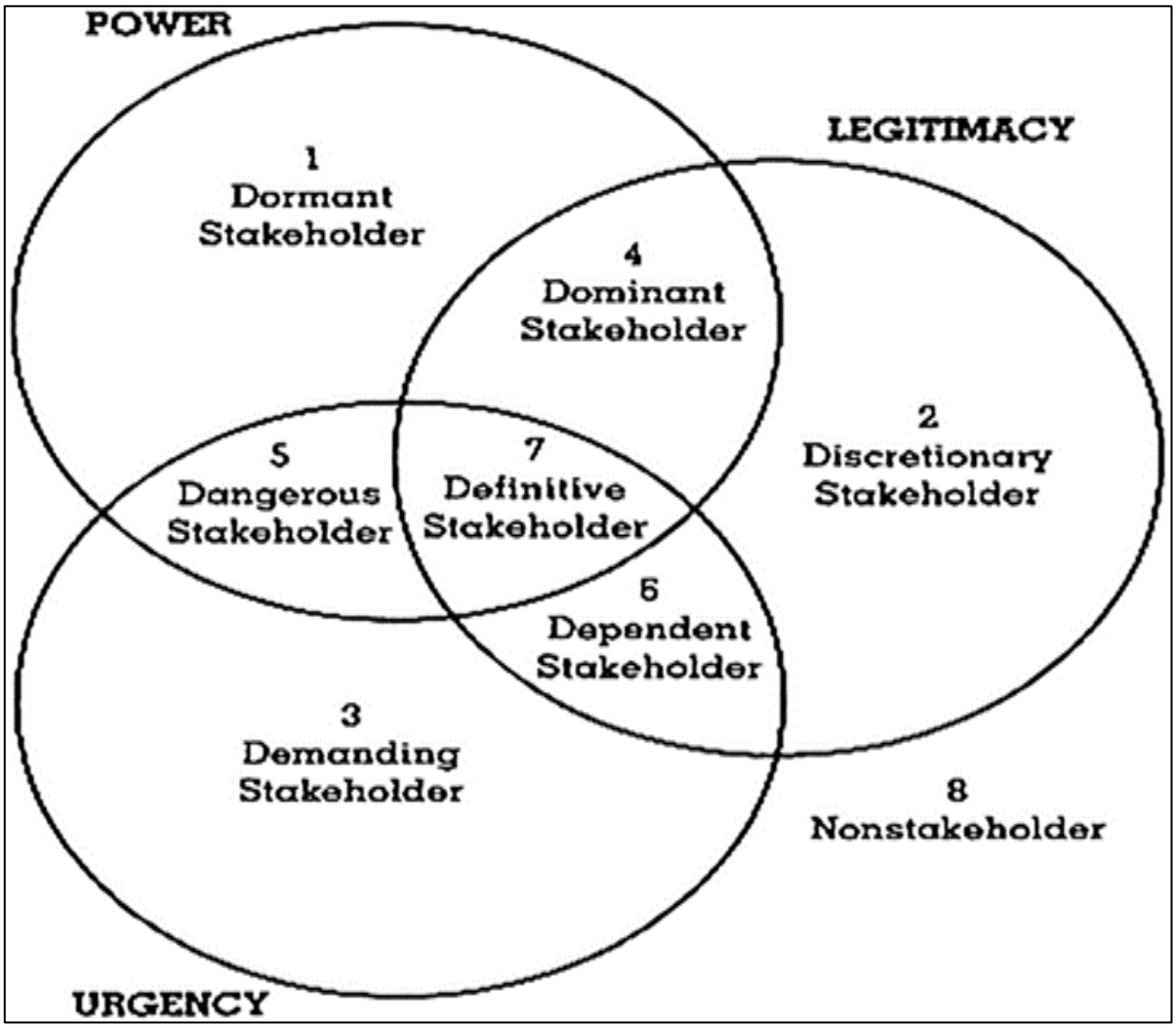

Figure 6: Stakeholder typology based on individual stakeholder attributes (Mitchell et al., 1997)

Stakeholder participation can enhance residents' satisfaction and ensure equal access to water resources. Studies have shown that when stakeholders are involved in decision-making processes, residents' satisfaction with water supply projects increases (Olivieri *et al*., 2022). Furthermore, stakeholder involvement can help address issues of equity and inclusivity in water management. For example, involving stakeholders in decision-making processes can ensure that the needs and concerns of marginalised communities are considered (Hove *et al*., 2021).

By including a diverse range of stakeholders in water conservation efforts, decision-makers can ensure that the strategies implemented are fair and equitable, benefiting all members of the community. Moreover, stakeholder involvement can lead to more effective and successful implementation of conservation measures. This is supported by research that has shown that in cases where stakeholder participation was present, there was greater uptake of conservation measures and fewer conflicts between stakeholders.

Stakeholder involvement in water demand management strategies can lead to enhanced decision-making and compliance. Research has shown that when stakeholders are actively engaged in decision-making processes, the quality of decisions improves (Tercini and Mello, 2022). Stakeholders bring diverse perspectives and expertise, which can lead to the identification of innovative solutions, consideration of different viewpoints, and the incorporation of new information and analysis. By involving stakeholders in the decision-making process, water managers have access to a wider range of ideas and expertise that can contribute to more informed and effective decision-making.

2.2.4 Stakeholder Involvement in Decision-Making and Compliance

By involving stakeholders in decision-making processes related to water conservation and demand management strategies, several benefits can be achieved. Firstly, stakeholder involvement promotes a sense of inclusivity and fair representation of all community members, including marginalised groups (Moulds *et al*., 2022). This inclusivity is important as it ensures that the needs and concerns of all stakeholders are taken into consideration, leading to more equitable and sustainable water management practices.

Furthermore, stakeholder involvement in decision-making processes has been found to improve the quality of decisions. This is because stakeholders bring diverse perspectives and expertise, which can lead to the identification of innovative solutions, consideration of different

viewpoints, and the incorporation of new information and analysis. For example, research conducted in the USA found that participation of stakeholders in environmental management resulted in improved decision quality, as it added new information, ideas, and analysis to the decision-making process (Reed, 2008). This highlights the value of stakeholder involvement in ensuring that water conservation and demand management strategies are based on a comprehensive understanding of the local context and incorporate a range of perspectives.

When stakeholders are actively involved in the decision-making processes and have a sense of ownership over the decisions that are made, they are more likely to comply with the regulations and measures that result from those decisions (Abbas *et al*., 2022). This compliance is essential for the effective implementation of water conservation measures and the achievement of sustainable water management. Research has shown that stakeholder participation in decision-making processes leads to greater uptake of conservation measures and fewer conflicts between stakeholders. For example, in Bangladesh, cases of fisheries management with stakeholder participation had greater uptake of conservation measures and fewer conflicts compared to cases without participation. Furthermore, stakeholder involvement in water conservation and demand management strategies can lead to increased public awareness and engagement. For instance, involvement of households in decision-making processes regarding rural water supply projects in India resulted in residents' satisfaction, equal access to water resources, and time savings (Alfredo *et al*., 2016).

This highlights the potential for stakeholder involvement to build social capital, promote equity, and create inclusive decision-making processes. Moreover, stakeholder participation in water conservation and demand management strategies is crucial for the successful and sustainable management of water resources. By including a diverse range of stakeholders, such as local communities, government agencies, non-governmental organisations, and water users, the decision-making process becomes more comprehensive and considers the needs, concerns,

and perspectives of all relevant parties. This not only enhances the legitimacy and acceptability of the decisions made, but also improves the quality of the decisions by incorporating new information, ideas, and analytical perspectives. Furthermore, stakeholder involvement contributes to the successful implementation of water conservation measures and compliance with regulations. By involving stakeholders in the decision-making processes, water conservation and demand management strategies can benefit from their knowledge and expertise. Additionally, stakeholder involvement can help identify potential barriers and challenges to implementation, as well as develop innovative approaches and solutions. In summary, stakeholder involvement in water conservation and demand management strategies is essential for the successful and sustainable management of water resources. Including stakeholders in water conservation and demand management strategies is crucial for several reasons. Firstly, stakeholders bring a wealth of knowledge and expertise to the decision-making process. They can provide valuable insights and perspectives that may not have been considered by experts alone. Secondly, stakeholder involvement ensures that the needs and concerns of all relevant parties are considered.

This helps to build trust and support for the strategies, as stakeholders feel included and heard in the decision-making process. Furthermore, stakeholder involvement helps to improve the quality of the decisions made. By incorporating a diverse range of perspectives, stakeholder involvement can lead to better-informed and more well-rounded decisions. Additionally, involving stakeholders can lead to the identification of potential barriers and challenges to implementing water conservation and demand management strategies.

This can help inform the development of strategies that are more feasible and effective in addressing these challenges. Stakeholders also play a crucial role in the successful implementation of water conservation measures.

Their involvement can help to increase awareness and understanding of the importance of water conservation, leading to greater compliance with regulations and adoption of conservation practices. Moreover, stakeholder involvement can promote equity in water conservation and demand management strategies. By including stakeholders, the strategies can ensure that the needs and concerns of disadvantaged communities or marginalised groups are addressed. This helps to promote equal access to water resources and ensure that the benefits and burdens of conservation measures are distributed fairly.

In conclusion, stakeholder involvement is essential for the success and sustainability of water conservation and demand management strategies. This involvement brings multiple benefits, including the contribution of knowledge and expertise, consideration of diverse perspectives, improved decision-making quality, identification of implementation barriers, increased awareness and compliance, and promotion of equity. In conclusion, the involvement of stakeholders is of paramount importance in Water Conservation Water Demand Management strategies.

2.2.5 Enhancing the Legitimacy and Compliance of Water Management Decisions

Stakeholder involvement in water conservation and demand management strategies is vital in enhancing the legitimacy and compliance of water management decisions. By including stakeholders in the decision-making process, water management decisions become more transparent and inclusive, ensuring that the interests and perspectives of all relevant parties are considered (Schultes *et al*., 2022). This not only increases the perceived fairness of the decisions but also promotes greater ownership and acceptance among stakeholders. Involving stakeholders in the decision-making process helps to identify potential implementation barriers and challenges, allowing for better planning and mitigation strategies.

Additionally, stakeholder involvement facilitates the exchange of knowledge and expertise. Stakeholders bring valuable insights, information, and perspectives that can contribute to more informed and effective decision-making (Wulandari *et al*., 2021). Stakeholder involvement fosters a sense of shared responsibility and collective action towards water conservation and demand management. When stakeholders are involved in the creation and implementation of strategies, their buy-in and support are more likely to be achieved (Khalid *et al*., 2019). This, in turn, increases the likelihood of successful implementation and adherence to water conservation and demand management measures.

Stakeholder involvement also contributes to developing robust and sustainable water conservation and demand management strategies. By including diverse stakeholders in the process, a broader range of perspectives and expertise can be considered, leading to more innovative and practical solutions (Thakur *et al*., 2022). Furthermore, stakeholder involvement fosters a sense of ownership and accountability among those who are directly affected by water management decisions (Khalid *et al*., 2019). They feel empowered to contribute to the development and implementation of strategies and are more likely to take ownership of their own water conservation efforts.

Incorporating stakeholder involvement in water conservation and demand management strategies has been widely recognised as a best practice in integrated water resources management. This approach has been proven effective in various countries and contexts. For example, in Uzbekistan and Tanzania, stakeholder participation was crucial for successful and sustainable water resource management efforts (Aguirre and Paredes, 2023). In Southeast China, household involvement in decision-making for rural water supply projects led to increased satisfaction, equal access, and time savings (Yu *et al*., 2015). Additionally, stakeholder involvement promotes inclusivity and equity in water management. By involving all relevant stakeholders, including community members, government officials, water utilities,

NGOs, and businesses, the voices and needs of different individuals and groups are considered. This helps to ensure that water conservation and demand management strategies are fair and equitable, addressing the needs of all stakeholders.

Furthermore, stakeholder involvement increases transparency and accountability in water management processes. Stakeholders are directly affected by water management decisions and, therefore, have a vested interest in the success and effectiveness of conservation strategies (Cantor *et al*., 2021). Their involvement in the decision-making process allows for a more comprehensive understanding of the challenges and opportunities related to water conservation.

They can provide valuable insights into local conditions, cultural norms, and economic factors that may impact the implementation of water conservation strategies.

Moreover, stakeholders can play a crucial role in the implementation and monitoring of water conservation and demand management strategies. Their active participation can help ensure that strategies are effectively implemented on the ground and that progress is regularly monitored and evaluated (Thakur *et al*., 2022). Overall, stakeholder involvement is crucial for the success of water conservation and demand management strategies. It can contribute to improved decision-making, increased inclusivity and equity, enhanced transparency and accountability, and effective implementation and monitoring.

The involvement of stakeholders brings valuable insights into local conditions, cultural norms, and economic factors that may impact the implementation of water conservation strategies (Teerakul *et al*., 2023). Stakeholders have a vested interest in the success of water conservation efforts as they are directly affected by the decisions made. Their active participation in the decision-making process ensures that their concerns and priorities are considered, leading to more effective and sustainable strategies (Thakur *et al*., 2022). Overall, stakeholder involvement in water conservation and demand management strategies is crucial for several

reasons. Stakeholders have valuable knowledge and expertise that can contribute to the development of effective strategies.

Lastly, stakeholder involvement fosters a sense of shared responsibility and collective action towards sustainable water resource management. Stakeholders can provide valuable insights into the social, economic, and cultural factors that may impact the success of water conservation initiatives. Their perspectives can help identify potential barriers and opportunities for successful implementation. In conclusion, stakeholder involvement in water conservation and demand management strategies is a crucial element for successful and sustainable water resource management.

2.2.6 Conceptual Framework for Stakeholder Involvement in Water Conservation

To effectively involve stakeholders in water conservation and demand management strategies, a conceptual framework can be developed. This framework will provide guidance on the process and methods for stakeholder engagement, ensuring that all relevant stakeholders are included in decision-making processes (König *et al*., 2021).

- The first step in the conceptual framework is to identify and classify stakeholders. Stakeholders can be individuals, communities, organisations, and institutions that are directly or indirectly affected by water conservation and demand management strategies.
- Once stakeholders have been identified, their level of influence and interest in the issue should be assessed. This will help prioritise stakeholders and determine the level of engagement required for each group.
- The next step in the framework is to design appropriate methods of stakeholder engagement. This can include a range of activities such as public consultations, surveys, focus group discussions, workshops, and meetings. These activities should be designed to foster two-way communication and encourage active participation from stakeholders.

Stakeholders should be given the opportunity to express their perspectives, concerns, and suggestions for water conservation strategies.

- The next step in the conceptual framework is to analyse and synthesise the inputs from stakeholders. This can involve identifying common themes, patterns, and areas of agreement or disagreement among stakeholders. This analysis will help in understanding the diverse perspectives and interests of stakeholders and inform the development of water conservation and demand management strategies that are inclusive and aligned with stakeholder needs and preferences.
- Once the inputs from stakeholders have been analysed, the next step in the framework is to integrate stakeholder inputs into decision-making processes. This can involve revising existing policies, developing new strategies, or implementing specific actions based on the inputs and feedback received from stakeholders. The integration of stakeholder inputs into decision-making processes is crucial for the success and effectiveness of water conservation and demand management strategies.

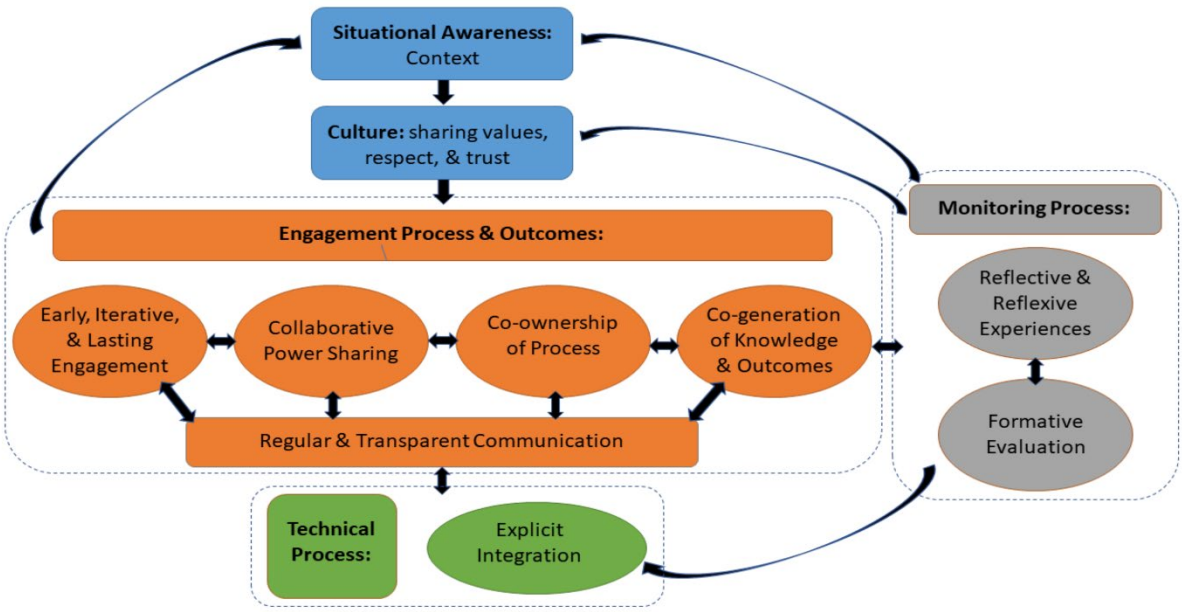

Figure 7: conceptual framework for best practices in community and stakeholder engagement (Kliskey and Griffith, 2021)

Stakeholder involvement in water conservation and demand management strategies is of utmost importance for several reasons. First and foremost, stakeholder involvement ensures that the decisions made regarding water conservation and demand management strategies consider the diverse perspectives and interests of those directly affected by these strategies (Thakur *et al*., 2022). Secondly, stakeholder involvement fosters transparency and accountability in decision-making processes. This is because stakeholders have a vested interest in the successful implementation of water conservation and demand management strategies and can hold decision-makers accountable for their actions.

Lastly, stakeholder involvement helps to build trust and buy-in from the community. When stakeholders are actively involved in the decision-making process, they feel heard and valued, which increases their trust in the water management authorities and their willingness to participate in and support water conservation efforts. One approach to involving stakeholders in water conservation and demand management strategies is using participatory processes (Tremblay and Harris, 2022). Participatory processes involve engaging stakeholders in the planning, implementation, monitoring, and evaluation of water conservation and demand management strategies. This can be done through various means such as conducting public consultations, holding stakeholder workshops, and forming stakeholder advisory committees (Thakur *et al*., 2022).

Although stakeholder involvement in water conservation and demand management strategies can be complex and time-consuming, it is essential for the success and effectiveness of these strategies. Stakeholder involvement in water conservation and demand management strategies has been proven to yield numerous advantages. For starters, stakeholder participation brings in new information, ideas, and analysis that can enhance the quality of decision-making (Joshi *et al*., 2020).

2.2.7 Effective Strategies for Enhancing Stakeholder Engagement in Water Management

To enhance stakeholder engagement in water management, it is important to employ effective strategies. One effective strategy is to establish clear objectives and goals for stakeholder involvement (Bakar *et al*., 2021). This includes clearly defining the roles and responsibilities of stakeholders, setting expectations for their involvement, and outlining the desired outcomes of the engagement process.

Another effective strategy is to ensure that stakeholders have access to relevant information and are provided with opportunities for meaningful participation (Jiménez *et al*., 2020). This can be achieved using various communication channels, such as public consultations, stakeholder workshops, and the formation of stakeholder advisory committees.

It is crucial to promote inclusivity and diversity in stakeholder involvement.

This can be done by actively identifying and engaging with stakeholders from diverse backgrounds, including different social, economic, and cultural groups (Ramulifho *et al*., 2019). Moreover, it is vital to create an environment that promotes open and transparent communication between stakeholders. This can be achieved by providing regular updates on the progress of water management initiatives, sharing information on decision-making processes, and actively seeking input and feedback from stakeholders throughout the planning and implementation stages (Jimenez *et al*., 2020). Additionally, it is important to consider the power dynamics and potential conflicts of interest among stakeholders. This can be done by implementing mechanisms to address power imbalances and ensuring that the decision-making process is fair and equitable.

Establishing strong partnerships and collaborations with stakeholders is another effective strategy for enhancing stakeholder engagement in water management (Musakwa *et al*., 2020). By working together and fostering collaborative relationships, stakeholders can leverage their collective knowledge, expertise, and resources to develop innovative solutions to water management challenges. Overall, stakeholder involvement is crucial in Water Conservation

Water Demand Management strategies. It helps to ensure that the perspectives and needs of all relevant stakeholders are considered in the decision-making process, leading to more informed and effective solutions (Thakur *et al*., 2022).

Stakeholder involvement in Water Conservation Water Demand Management strategies is of utmost importance for several reasons. Firstly, stakeholders have a direct say in the outcomes of water management initiatives (Smol and Koneczna, 2021). Their participation allows for their perspectives, experiences, and needs to be considered, leading to more equitable and inclusive decision-making processes.

This involvement also promotes the building of trust and social capital among stakeholders, fostering stronger relationships and collaborations. This is beneficial because it creates a sense of ownership and shared responsibility for water management outcomes, leading to better implementation and long-term sustainability of initiatives.

Secondly, stakeholder involvement brings valuable knowledge and expertise to the table (Satilmisoglu and Keskin, 2023). Stakeholders often possess local knowledge and insights that can contribute to more effective water conservation and demand management strategies. For example, local communities may have traditional water management practices honed over generations and can provide valuable insights into sustainable water use (Gebregziabher *et al*., 2016). By involving stakeholders in the decision-making process, their knowledge and expertise can be harnessed to develop context-specific solutions that are more likely to be effective in addressing local water challenges.

Furthermore, stakeholder involvement enhances the legitimacy and acceptance of water management strategies.

When stakeholders are involved in the decision-making process, it increases the likelihood that the implemented strategies will be seen as fair and legitimate by affected individuals and communities. This not only helps to avoid conflicts and resistance to implementation but also

ensures the long-term success and sustainability of water management initiatives. Lastly, stakeholder involvement can lead to more innovative and creative solutions.

2.2.8 Overcoming Challenges in Stakeholder Participation in Water Conservation

Despite the numerous benefits of stakeholder involvement in water conservation and demand management strategies, there are challenges that need to be addressed to effectively engage stakeholders. One challenge is the complexity of stakeholder dynamics and interests. Stakeholders in water management often have diverse perspectives, interests, and power dynamics. Navigating these complexities requires careful facilitation and mediation to ensure that all voices are heard and considered in decision-making processes.

Additionally, there may be limited resources and capacity for stakeholder engagement. This can include funding, time, and expertise (Gilroy *et al*., 2022). To overcome these challenges, it is essential to have a clear and transparent process for stakeholder participation. This can include establishing clear objectives, providing accessible information, and creating opportunities for meaningful and equal participation. By doing so, stakeholders can feel empowered and informed, which increases their motivation to actively participate in the water conservation efforts.

Another challenge is the lack of awareness and understanding among stakeholders about the importance of water conservation and demand management.

This can be addressed through effective communication and education initiatives that aim to raise awareness about the significance of water conservation and its impact on the environment, economy, and society. Furthermore, the lack of trust between stakeholders and water management agencies can hinder effective participation. Building trust requires transparency, accountability, and open communication between all parties involved. This can be done

through regular communication channels, feedback mechanisms, and building relationships based on mutual respect and understanding.

Stakeholder involvement is crucial in water conservation and demand management strategies. It helps to improve the quality of decisions by incorporating diverse perspectives and knowledge, minimise conflicts between stakeholders, and enhance the implementation of conservation measures. Stakeholder involvement ensures that the interests and concerns of all relevant parties are considered, increasing the likelihood of successful and sustainable water resource management. In today's rapidly changing world, the significance of accurate weather forecasts cannot be overstated. Furthermore, water scarcity and the unsustainable use of water resources pose significant challenges globally.

2.2.9 Case Studies Highlighting Stakeholder's Role in Water Conservation

Several case studies provide evidence of the importance of stakeholder involvement in water conservation and demand management strategies. For example, in the United States, over 200 case studies on stakeholder participation in environmental management showed that involvement improved the quality of decisions and led to the development of win-win solutions. This demonstrates how diverse perspectives and new information can contribute to more effective water conservation strategies.

Another example is seen in Tanzania, where stakeholder participation was found to be crucial for successful and sustainable water resource management efforts (Kabogo *et al*., 2017). Household involvement in decision-making processes in rural water supply projects in Southwest China also had a positive impact, leading to increased satisfaction, equal access, and time savings for residents (Yu *et al*., 2015). These case studies highlight how stakeholder involvement can lead to improved outcomes in water conservation and demand management

strategies. Furthermore, stakeholder involvement has been recognised as a key component of integrated water resources management practices globally.

2.2.10 Importance of stakeholder involvement in Water Conservation Water Demand Management Strategy

Stakeholder involvement plays a vital role in water conservation and demand management strategies. It helps to improve the quality of decisions by incorporating diverse perspectives and knowledge, minimise conflicts between stakeholders, and enhance the implementation of conservation measures. By involving stakeholders, such as government agencies, community organisations, indigenous groups, and water users, a more comprehensive understanding of the local context and issues can be gained. This understanding can lead to the development of more effective and tailored strategies that address specific challenges and meet the needs of all stakeholders involved. Furthermore, stakeholders bring their expertise and on-the-ground experience, which can contribute valuable insights and innovative solutions to water conservation efforts. Additionally, stakeholder involvement promotes transparency and accountability in decision-making processes, as it allows for open dialogue and collective decision-making.

2.2.11 Importance of Stakeholder Education in Water Demand Management

In addition to stakeholder involvement, stakeholder education is also crucial in water demand management. Stakeholders need to be educated about the importance of water conservation, the potential impacts of their actions on water resources, and the strategies and technologies available to reduce water consumption.

This education can help create a sense of ownership and responsibility among stakeholders, encouraging them to actively participate in water conservation efforts. Furthermore, stakeholder education can lead to behavioural changes that are critical for sustainable water resource management. Stakeholder involvement in water conservation and demand

management strategies is essential for several reasons. Firstly, stakeholders have valuable knowledge and expertise that can contribute to the development of effective water conservation strategies. Their perspectives can provide insights into local water issues, cultural practices, and potential barriers to implementation. Secondly, stakeholder involvement promotes transparency and inclusivity in decision-making processes.

It allows for a more democratic approach, ensuring that all relevant voices are heard and considered. Thirdly, stakeholder involvement helps to minimise conflicts and foster collaboration among different parties. By involving stakeholders in the decision-making process, potential conflicts and disagreements can be addressed and resolved early on, leading to more successful implementation of conservation measures. Lastly, stakeholder involvement increases the likelihood of successful implementation and long-term sustainability of water conservation measures.

2.2.12 Future Directions for Stakeholder Involvement in Water Conservation

The importance of stakeholder involvement in water conservation and demand management strategies cannot be understated. Stakeholders play a pivotal role in driving sustainable consumption strategies and shaping decision-making processes for natural resource conservation.

Their involvement leads to a more comprehensive understanding of the local context and issues, encourages behavioural changes, promotes transparency and inclusivity, and minimises conflicts. There are several key areas where stakeholder involvement in water conservation can be further strengthened and improved. Firstly, there is a need to enhance stakeholder education and awareness. This can be achieved through targeted campaigns, workshops, and training programs that provide stakeholders with knowledge about water conservation practices, the importance of efficient water use, and the potential impacts of water scarcity. Secondly, there

should be increased efforts to involve traditionally marginalised stakeholders, such as indigenous communities and low-income populations. Their perspectives and experiences are often underrepresented in decision-making processes, yet they can offer valuable insights and solutions. Finally, it is crucial to establish effective mechanisms for ongoing stakeholder engagement and feedback. This can be done using regular meetings, surveys, and forums where stakeholders can provide input, raise concerns, and contribute to the development and implementation of water conservation strategies. In conclusion, stakeholder involvement is of utmost importance in water conservation and demand management strategies. It not only helps to minimise conflicts and foster collaboration among different parties but also leads to more successful implementation of conservation measures. Stakeholders' involvement in water conservation and demand management strategies is crucial in addressing challenges and ensuring the sustainability of water resources.

2.2.13 Evaluating Success of Stakeholder Involvement in Water Conservation

The importance of stakeholder involvement in Water Conservation Water Demand Management strategies cannot be emphasised enough. Stakeholder involvement plays a crucial role in the success, sustainability, and effectiveness of water conservation efforts. By involving stakeholders in the decision-making process, water managers can benefit from the diverse perspectives, expertise, and knowledge that stakeholders bring. Stakeholders, including community members, government entities, non-governmental organisations, and industries, have unique insights and experiences that can contribute to informed decision making and the development of effective water conservation measures. Furthermore, involving stakeholders in the decision-making process increases the legitimacy of management decisions and promotes compliance with the implemented measures. Additionally, stakeholder involvement promotes inclusivity and fair representation of all community members, ensuring that the needs and

concerns of marginalised groups are taken into consideration. To illustrate the success of stakeholder participation, numerous case studies have shown positive outcomes.

2.3 WATER CONSERVATION WATER DEMAND MANAGEMENT STRATEGIES

Water scarcity is a pressing issue in South Africa, and it is necessary for municipalities to implement effective water conservation and demand management strategies (Ngaka, 2012). These strategies aim to promote efficient water use and reduce overall water demand, ultimately ensuring the availability of this precious resource for future generations (Expósito, 2019). One critical aspect of successful water conservation and demand management strategies is stakeholder involvement. Stakeholder involvement refers to the active participation and engagement of individuals and groups who have a vested interest in water conservation and demand management initiatives (Jensen and Uddameri, 2009). Water conservation and demand management strategies are essential for municipalities to ensure sustainable water resource management (Yu *et al*., 2020). Water conservation and demand management strategies are essential for municipalities to ensure sustainable water supply (Saha *et al*., 2016). These strategies aim to reduce water loss or waste, protect water resources, and promote efficient and effective use of water. One example of a municipality implementing water conservation strategies is the Rustenburg Local Municipality, located in a mining town. In recent years, water demand and availability have become critical issues that governments and authorities must address (Zese *et al*., 2021). The Rustenburg Local Municipality has recognised the importance of implementing water conservation and demand management strategies to address these challenges.

One key aspect of the water conservation strategy in Rustenburg is working on the control of water leaks. Water leak control at different levels is a necessary tool for sustainable water resource management. By identifying and repairing leaks in the water distribution system, the municipality can significantly reduce water loss and ensure that the available water is

effectively utilised (Lee and Yoo, 2021). Additionally, the municipality can also implement water pricing as a conservation strategy (Otto *et al*., 2018). Water pricing is an economic tool that can incentivise individuals and businesses to use water efficiently. However, it is important to strike a balance in water pricing to ensure that it reflects the true cost of water production without negatively impacting other environmental, social, and economic aspects. Another important aspect of the water conservation and demand management strategy in Rustenburg is the promotion of behavioural change. This involves educating the community about the value of water and the importance of using it wisely. Through awareness campaigns and educational programs, the municipality can encourage individuals to adopt water-saving behaviours such as fixing leaks, using water-efficient appliances, and practicing responsible water use. The City of Cape Town serves as a model for effective water conservation and demand management strategies (Quandt *et al*., 2022). The City of Cape Town has adopted a comprehensive water conservation and demand management strategy aimed at reducing water loss or waste, protecting water resources, and promoting the efficient and effective use of water (Mauck and Winter, 2021). The strategies implemented in Cape Town have been successful in stabilising water demand growth and reducing water loss. These strategies include the implementation of smart water meters, which provide real-time data on water usage and help individuals monitor their consumption (Niggli *et al*., 2022).

2.3.1 Exploring Opportunities for Water Conservation and Demand Management Strategies in Municipalities

Water conservation and demand management strategies play a crucial role in ensuring the sustainable use of water resources in any community, particularly in a mining town like Rustenburg (Thakur *et al*., 2022). To address the challenges of water scarcity and promote efficient water use, the Rustenburg Local Municipality can implement various strategies such as:

- The adoption of water pricing as a conservation tool. Water pricing can serve as an economic instrument to incentivise individuals and businesses to use water efficiently (Gupta *et al*., 2020). By implementing a tiered pricing structure, where the price of water increases with higher levels of consumption, residents and businesses will be incentivised to reduce their water usage and opt for water-saving alternatives.
- The implementation of water restrictions (Reynaud and Romano, 2018). Water restrictions can help to manage and reduce water demand by setting limits on certain water-consuming activities, such as watering lawns or washing cars.
- Invest in infrastructure upgrades and maintenance to minimise water leaks and losses (Yilmaz *et al*., 2021).
- Implementation of public awareness campaigns and education programs, can encourage responsible water use and contribute to the overall conservation efforts (Alarcón *et al*., 2019)
- Pressure management initiatives involve monitoring and regulating the water pressure in the municipal water supply system (Rupiper *et al*., 2022). By reducing water pressure, the municipality can minimise leakages and pipe bursts, thus conserving water and reducing water loss. This strategy can be implemented using pressure control valves and smart metering technology, which can monitor and adjust water pressure based on demand.

2.4 POLICY AND LEGAL FRAMEWORK FOR POTABLE WATER SERVICES IN LOCAL GOVERNMENT IN SOUTH AFRICA

2.4.1 Introduction

According to the Constitution of 1996, individuals in South Africa are entitled to various rights, including access to an adequate food supply, water resources, and social security. The

Constitution guarantees every citizen's right to sufficient water and mandates that the government take necessary measures towards progressively achieving this right. Local government is accountable for providing water and sanitation services by developing plans and delivering safe drinking water as well as domestic water systems. Furthermore, community involvement in service planning is highly valued according to the Constitution.

The momentous political shift in South Africa led to the introduction of a set of fundamental values that are deeply embedded in the 1996 Constitution (Abrams, 1996:35). Hence, it is imperative to establish an efficient structure that guarantees the preservation, utilisation, development, administration, and regulation of the nation's water resources in a manner that is both sustainable and fair for all stakeholders. This framework should encompass the provision of essential services and economic advantages for humans, flora, and fauna (Thompson, 2006:13).

The implementation of the Free Water Policy was formally initiated in July 2001. Most of the Water Services Authorities, totalling 155 out of 170, reported that they were successfully implementing the provision for Free Basic Water. This policy ensures that each household is entitled to receive a maximum amount of 6000 litters of clean water per month (Burger, 2004/5:63). Efforts are being made to address the issue concerning individuals without access to safe drinking water by providing direct delivery or ensuring convenient proximity from their residences (Kido, 2008:84).

Under the Local Government Municipal Systems Act 32 of 2000, municipalities are required to prioritise the basic needs of their local communities and ensure that all residents have access to essential services.

2.4.2 The Constitution of The Republic of South Africa

Under the democratic constitution of 1996, individuals possess the legal entitlement to obtain clean and adequate water. This constitutional framework operates within the country's legislative structure, with the Department of Water and Sanitation being responsible for shaping and executing policies relating to water supply and sanitation programs. Section 27 of the Constitution guarantees that all residents of South Africa have access to sanitary water resources as well as a healthy environment in their localities. Consequently, Rustenburg Local Municipality has committed itself to delivering services oriented towards meeting people's needs by ensuring that basic functioning water services are accessible by everyone residing within its jurisdiction.

Water service delivery in South Africa is governed by the Constitution Act 108 of 1996 and the Water Services Act 108 of 1997. These laws entrust local governments with the responsibility of providing sustainable water services to their communities. As outlined in Section 153 of the Constitution, municipalities are mandated to prioritise basic needs and strive for social and economic development within their jurisdictions.

The provision of water and sanitation services in South Africa is the responsibility of local government, which is tasked with planning and delivering potable water supply and domestic water systems. The importance of community participation in service planning is emphasised by the Constitution.

The water services sector in South Africa faces various challenges that are linked to the country's social and political history. These challenges include a backlog of basic water services, affecting approximately 25% of the population, as well as financial viability issues stemming from inefficiencies and non-payment by over 50% of those in authority.

According to Bekink (2006), poor coordination could severely undermine the new development efforts. An important method to ensure improved coordination and commitment is through the process of the Integrated Development Planning.

The Strategic Framework for Water Service provides a summary of the policy with respect to the water services sector in South Africa. It outlines the vision, goals, and targets to be achieved by the Water Service Sector over the next decade and set up norms and standards for water services (Mvula, 2005).

The water service sector aims to achieve the following objectives:

- Ensuring that all citizens of South Africa have access to suitable, secure, satisfactory, and affordable basic water supply and sanitation.
- Educating all individuals in South Africa on healthy lifestyles and responsible use of water.
- Providing accessible water and sanitation services for the population.
- All Water Service Authorities have a responsibility to the residents residing in their respective areas and are obligated to regulate water services in accordance with the Constitutional Bill of Rights.
- It is expected that all water service providers demonstrate accountability, cost-effectiveness, efficiency, and viability.
- Measures aimed at ensuring cost-effective provision of water services and sanitation should be both socially and economically viable; they should promote financial sustainability and encourage responsible use of resources.

To ensure the sustainable and equitable use of water resources in South Africa, it is crucial to establish a comprehensive framework that encompasses protection, development,

management, and control. This framework should prioritise the provision of essential water services to optimise long-term benefits for the environment as well as social and economic factors affecting people, plants, and animals (Thompson 2006).

It is essential for all individuals in South Africa to have access to an adequate level of water and sanitation services. The Bill of Rights enforces these rights as obligations, rather than mere aspirations. As outlined by Bekink (2006), any remaining disparities regarding equitable access to water services must be addressed through the establishment of new infrastructure or the improvement and modernisation of existing infrastructure.

The South African government is dedicated to ensuring that its citizens receive sustainable access to basic water supply and sanitation by 2010 (SA Yearbook, 2007).

Water service authorities are obligated under the Water Services Act to establish criteria for discontinuing water services, including outlining the procedures involved. It is essential that residents have a clear understanding of these conditions and procedures. Moreover, it is crucial that the set conditions promote fairness within society.

To fulfil their financial and administrative responsibilities, local authorities are encouraged to pursue the following goals:

- Upholding democratic principles of governance that promote accountability for local communities.
- Ensuring the provision of services to citizens in a manner that is sustainable.
- Facilitating social and economic development within the community.
- Promoting a safe and healthy environment for all residents.

2.4.3 Housing Act 107 OF 1997

Section 26 of the Constitution of the Republic of South Africa, implemented in 1996 after gaining independence, guarantees every citizen's right to adequate housing as follows:

(1) everyone has the right to have access to adequate housing.

(2) The State must take reasonable legislative and other measures within its available resources, to achieve the progressive realisation of this right.

Government's human settlement development mandate emanates from the Constitution of 1996.

As a result, it is imperative for the government to actively work towards ensuring that all South African citizens have equal access to secure land rights, sufficient housing, essential services, necessary resources, and suitable infrastructure. The government must employ various legal frameworks, administrative procedures, financial investments, educational initiatives, and social interventions to meet its responsibilities regarding housing provision.

The goal for housing development in South Africa is to create sustainable and inclusive communities that provide convenient access to economic opportunities, healthcare, education, and social amenities. The government aims to ensure that all South Africans gradually have access to affordable and decent housing in suitable locations.

The objective of the housing initiative is to establish viable communities that promote social and economic integration. These communities should be strategically situated in areas with convenient access to employment opportunities and vital services like healthcare, education, and recreational facilities. The overarching goal is for all South Africans to gradually gain access to these communities.

The objective of the housing vision is based on principles such as sustainability, viability, integration, equality, reconstruction, holistic development, and good governance. The housing policy and strategy in South Africa aim to promote a democratic integrated society that is non-

racial and non-sexist. The primary goal is to enhance the quality of life for all citizens in South Africa, particularly focusing on those who are economically disadvantaged or unable to fulfil their basic housing requirements independently.

2.4.4 Water Services Act 108 Of 1997

The Water Service Act 108 of 1997 establishes a regulatory framework for the provision of water services, addressing matters related to water resource management and usage.

According to Schedule 4 of the Constitution, local municipalities are entrusted with the responsibility of providing water and sanitation services. This provision enables the establishment of water utilities at the local level and facilitates opportunities for concessions and public-private partnerships to be formed.

The primary objective of the Act is to guarantee and delineate the entitlement to obtain fundamental water supply and basic sanitation services that are essential for ensuring an adequate water supply, a safe environment conducive to human health and well-being. Additionally, it outlines the rights and responsibilities of consumers as well as providers of these services. Furthermore, this empowers the Minister of Water and Sanitation to establish national benchmarks (including norms and standards) to ensure consistent, accessible, affordable, and equitable water services.

The National Water Act mandates that Water Services Institutions must implement appropriate measures to ensure the fulfilment of the right to access basic water supply and sanitation. The act specifically requires each Water Services Authority to create and approve a comprehensive development plan for water services, with consideration given to ensuring basic access rights. While local governments participate in collaborative governance, they bear primary responsibility for guaranteeing universal access to essential water supply and sanitation services within their jurisdiction.

Before 1994, the Department of Water Affairs and Forestry served as the authority for water services in South Africa. However, with the implementation of the Water Services Act 108 of 1997, access to basic water supply and sanitation services became a right. This act transferred powers to district municipalities who then delegated these responsibilities to local municipalities. The Rustenburg Local Municipality appointed Magalies Water, Rand Water, and Rustenburg Water Services Trust as service providers for its area.

In accordance with Bekink (2006), the supply of water, particularly drinking water, to the local populace is widely recognised as a fundamental service that municipalities are obligated to provide. The absence of adequate water and sanitation infrastructure and services poses significant challenges for sustainable human settlements. Consequently, it appears that the responsibilities and objectives related to development outlined in the Constitution align closely with the provision of water and sanitation services by municipalities.

It is imperative for municipalities to facilitate the provision of enhanced services for domestic users and promote services that contribute towards sustainable livelihoods and economic development. In accordance with the Water Services Act, each water service authority is required to create a comprehensive water services development plan specific to their municipality. This plan must encompass input from all stakeholders and consider suggestions and comments before being finalised. Its aim is to ensure collaborative efforts among all water users and entities within a municipality, promoting sustainability in the process.

The Integrated Development Plan is a key strategic tool for municipalities, as stated in the Local Government Municipality System Act 32 of 2000. It serves several important purposes.

1. The IDP allows municipalities to align their resources with agreed policy objectives and programs.

2. It facilitates the integration of local government activities with other levels of government.
3. The IDP promotes engagement between local government and citizens at the grassroots level.
4. Municipalities can use the IDP to assess their obligations and prioritise programs and resource allocation systematically.

Municipalities must adhere to the Integrated Development Plan mandated by law as a means of ensuring effective planning, development, and decision-making processes that meet community needs while promoting socio-economic progress.

Under the Municipal Systems Act 32 of 2000, it is mandatory for municipalities to address water and sanitation issues within their jurisdiction. This responsibility includes addressing the priorities outlined in their IDPs. The Water Services Act 108 of 1997 and the Local Government Municipal Systems Act also require Water Services Authorities to develop and implement by-laws that define guidelines for water service provision. These guidelines encompass various conditions such as:

- Requests for water provision.
- Agreements with consumers regarding services.
- Pricing and fees. Specific regulations or terms pertaining to water supply.
- Water disconnection procedures and related services.
- Cancellation of consumer agreements.
- Termination of water supply connections.
- Special limitations on usage.
- Approaches for addressing failures in delivering water service.

- Sale of water by consumers.

The integration of water and sanitation issues into the DP is crucial for municipalities to effectively address the needs of their communities. This entails developing comprehensive strategies and action plans that align with national and provincial objectives. The IDP serves as a blueprint for municipalities to prioritise water and sanitation projects, allocate resources accordingly, and ensure the delivery of quality services to their residents.

Furthermore, the IDP emphasises the importance of coordination and collaboration between different stakeholders involved in water management. This includes not only the municipality itself but also water service authorities, government departments, community organisations, and individual water users. By promoting a collaborative approach, the IDP facilitates the sharing.

2.4.5 The National Water Act 36 of 1998

The National Water Act 36 of 1998 aims to ensure the sustainable protection, use, development, conservation, management, and control of water resources. It considers various factors to promote equitable access to water and facilitate social and economic development while addressing past discrimination. Additionally, it promotes the efficient and beneficial use of water in the public interest while protecting aquatic ecosystems and reducing pollution. The act also addresses obligations for water management as well as managing floods, and droughts, and promoting dam safety.

The National Water Act, as outlined by Burger (2004), seeks to integrate the management of surface and groundwater to promote sustainable usage. It also establishes a policy framework for water markets to address issues of allocation and demand. Additionally, the Act grants the Minister of the Department of Water and Sanitation authority to develop a pricing strategy for water usage (Blignaut and De Wit, 2004).

To enhance the quality of water for the residents within the Rustenburg Jurisdiction, it is necessary to implement Water Quality Management in the overall Supply System and address overall Drinking Water Quality in Rustenburg Local Municipality. The Water Services Act emphasises the importance of implementing a preventative maintenance program and maintaining proper documentation of all maintenance issues within a municipality's jurisdiction.

The provision of potable water to the residents of The Rustenburg Local Municipal inclusivity is insufficient due to ongoing interruptions in the water supply from the Vaalkop and Bospoort Dam, which affects areas serviced by the Rustenburg Local Municipality. This situation has caused significant distress among the community members. As per their legal obligation, it is required that basic water services be provided by the municipality. The Department of Water and Sanitation mandates that municipalities must ensure that supplied drinking water meets all necessary quality and safety standards.

2.4.6 National Environmental Management Act 107 of 1998

The National Environmental Management Act 107 of 1998 (NEMA) establishes a structure to ensure that every individual has the right to a safe and healthy environment, which should be safeguarded for present and future generations.

The principles outlined in NEMA serve as the foundation for interpreting the Act's implementation and evaluating administrative justice. These principles emphasise prioritising people's well-being, encompassing their physical, psychological, developmental, cultural, and social interests equitably. Additionally, sustainable development is emphasised as being environmentally sound while also considering social and economic factors.

To prioritise the health and well-being of the people, NEMA emphasises intergovernmental coordination and harmonisation of policies, legislation, and actions related to the environment.

It serves as a comprehensive framework that guides decision-making in all environmental matters within South Africa (Steyn 1999). The importance of the environment cannot be overstated, especially considering its crucial role in sustaining human life.

Water usage activities have a significant impact on the environment, and it is essential to consider the environmental costs when evaluating the economic benefits of different water uses and developments. To maintain sustainable water use, it is crucial to protect the natural resources upon which it depends. However, while safeguarding the environment, there is also potential for job creation through utilising available water resources for tourism and recreational purposes (Bond, 2003).

Section 152 of the Constitution outlines various matters pertaining to local government responsibilities in relation to environmental management. Of relevance are:

- Provision of potable water supply systems and domestic wastewater disposal systems.
- Management of storm water in built-up areas.
- Control of air pollution.
- Firefighting services.
- Municipal planning.
- Maintenance of cleanliness.
- Development and upkeep of municipal parks and recreation facilities.

The governments' commitment to long-term sustainable development is demonstrated by acknowledging that the economic systems are interconnected with and reliant on the social system. The principles outlined in the National Environmental Management Act emphasise that it is essential to maintain the natural environment in a sustainable manner, ensuring survival for future generations. Fuggle (2000) proposes several principles for establishing a sustainable society:

- Show respect and care for communities' well-being.
- Enhance human life quality.
- Preserve the earths' capacity to support life.
- Minimise the consumption of non-renewable resources.
- Stay within earths' carrying capacity limits.
- Encourage individuals to adopt attitudes and behaviours that promote environmental stewardship at community levels.
- Establish a national framework that integrates development and conservation efforts successfully.
- Foster international collaboration in managing global sustainability issues.

The citizens of Rustenburg Local Municipality hold a significant responsibility in the management and preservation of their local environment. It is crucial for them to prioritise environmental sustainability and protection, as issues such as water pollution, air pollution, and degradation can have adverse effects on public health. Promoting public awareness is vital for achieving sustainable environmental management goals. Educational institutions are particularly influential in disseminating government policies and fostering the development of a sustainable society.

2.4.7 Local Government: Municipal Structures Act 117 of 1998

The Municipal Structures Act 117 of 1998 outlines the powers and responsibilities of municipalities, particularly their role as Water Services Authorities in ensuring water provision within their jurisdiction. The implementation of the Local Government: Municipal Structures Act 117 of 1998 marked a significant milestone in defining the role of local government in promoting development. According to Nealer and Eden (2010), this act provided a clear

framework for locally oriented governance focused on delivering essential services, including access to safe drinking water for communities.

The Local Government Municipal Structures Act 117 of 1998 outlines the various categories and types of municipalities, distribution of powers and responsibilities, regulations for internal systems and structures, appointment criteria for office-bearers, as well as electoral systems (Van der Waldt *et al*., 2007).

2.4.8 Local Government: Municipal Systems Act 32 of 2000

The Municipal Systems Act distinguishes between the roles of a water services provider and a Water Services Authority. It governs the delivery of these services by either municipalities or through external service providers, as outlined in section 78. The Constitution of South Africa mandates that the Municipal Systems Act 32 of 2000 should strive for the gradual improvement of local communities' social and economic well-being, while also guaranteeing equitable access to essential services that are within everyone's financial reach.

The implementation of the Municipal Systems Act 32 of 2000 aims to facilitate the socioeconomic development of local communities. It also seeks to ensure that all citizens in South Africa, regardless of race, gender, or age, have affordable access to essential services. The municipal authorities must prioritize maintenance and upkeep of basic services like potable water infrastructure for efficient delivery.

According to the act mentioned, municipalities are required to establish a culture of municipal governance that combines formal representative government with participatory governance and encourages community involvement. The act also outlines specific measures for promoting public participation, such as creating opportunities for local communities to engage in municipality affairs and supporting the capacity building of community members, councillors, and staff members.

2.4.9 The South African Drinking Water Quality Framework

The Rustenburg Local Municipality follows guidelines outlined in the South African Drinking Water Quality Framework to ensure that the supply of water meets established norms and standards. This framework mandates municipalities to treat and test water before it can be declared safe for drinking purposes.

Compliance with drinking water regulations is essential to minimise health risks associated with consuming contaminated or poor-quality water (RSA, 1997a). If substandard water is provided to the community, it could lead to detrimental effects on public health as well as increased pressure on healthcare facilities such as clinics and hospitals.

2.4.10 Integrated Development Plan (IDP)

As stated in Section 13(f) of the Water Services Act 32 of 2000, it is obligatory for municipalities to actively engage and collaborate with local communities when developing their IDP. This legal mandate emphasises that municipalities should strive to achieve the objectives outlined in Section 152 of the Constitution of South Africa while fulfilling their development-related responsibilities as stipulated in Section 153 of the Constitution. Considering the Batho Pele Principles, community involvement in decision-making processes regarding service delivery is crucial.

The IDP plays a crucial role in guiding municipalities in fulfilling their developmental responsibilities. It helps identify the challenges within a municipality and provides strategies to effectively address these issues, considering available resources. However, there are instances where the Rustenburg Local Municipality misuses its IDP by solely treating it as a budget compilation document. This leads to misallocation of project funds, which violates the regulations set forth by the Municipal Finance Act.

2.4.11 Role of Community Participation

According to the Municipal Systems Act 32 of 2000 (Section 16), municipalities are obligated to foster a culture of municipal governance that facilitates community participation in various aspects, such as the development and evaluation of their integrated development plan, implementation and assessment of their performance management system, monitoring and review of overall performance outcomes and impact, as well as budget preparation and strategic decision-making pertaining to municipal service provision. These requirements outlined in Chapters 5, 6, and 8 emphasise the importance for municipalities to actively engage with local communities.

According to Basset (2006), participatory communication is crucial in the identification of conflict resolutions within communities, as well as their capacity to address and solve problems independently without relying on external assistance.

It is imperative for both the National and Provincial Government to provide support and enhance the capabilities of municipalities in managing their affairs (Motshekga, 1996). Consequently, it becomes necessary for the Department of Water and Sanitation, being responsible for water resources, to ensure that only qualified individuals with expertise in water and sanitation service delivery are employed by local municipalities. The transfer of skilled personnel to these municipalities would enable a more effective, efficient, and cost-friendly provision of water services and sanitation.

2.5 Conclusion

Based on the discussions, it is evident that water plays a vital role in maintaining sustainable livelihoods. It is imperative to recognise the well-being of individuals and foster their commitment towards promoting a sustainable water supply. Therefore, all consumers must take appropriate measures to prevent pollution and waste of water as such actions can jeopardise peoples' lives.

To ensure the sustainability of water provision, Rustenburg Local Municipality should enforce its by-laws and regulate water usage. As part of the effective management of water resources, it is crucial to oversee the activities of those who rely on river systems as sources for freshwater.

Addressing the issue of water supply within the Rustenburg Local Municipality requires collaborative efforts from all stakeholders. Establishing relationships and developing a shared vision among these stakeholders is crucial in responsibly managing and conserving water resources.

The legislative framework for water management, including strategies outlined above, forms the basis for effectively managing potable water supply within South Africas' local government sphere. The next chapter presents the research design and methodology used in this research.

CHAPTER 3: RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction

This chapter outlines and explains the methodology used in this study. It presents the approach that the study took to investigate and assess the role of stakeholders' expectations within the water demand management strategy of the municipality. This chapter critically reviews the choices of research techniques, data collection methods, and sampling methods.

This chapter will discuss research design concepts, and it is imperative to outline the concept of methodology before proceeding with detailing the method applied to this study. This methodology pertains to the practical framework in which information is attributed significance. There are two primary research paradigms: quantitative and qualitative. The former is commonly known as the positivist, conventional, and experimental research approach, while the latter can be characterized as naturalistic, interpretive, and constructivist (Leedy, 1993). Saunders, Lewis, and Thornhill (2003:8) further defined “methodology as a framework of theories as well as principles upon which methods and procedures are based”.

3.2 Research Paradigm

A research paradigm is a framework that scientists and researchers used to construct, test, and refine their studies, serving as a guide or map to identify which research methods should be used and how they should be implemented. It reflects the researchers’ worldview or belief system about the nature of knowledge and existence (ontology and epistemology) and determines the approach taken in the investigation: positivist (quantitative), interpretive (qualitative), or pragmatic (mixed methods).

The term "research paradigm" soared in popularity in the 1960s, largely due to the influence of philosopher and historian of science, Thomas Kuhn. In his seminal book "The Structure of Scientific Revolutions" he used the term "paradigm" to refer to the shared concepts, methods,

and assumptions that constitute a scientific community's shared framework during a specific period. However, the idea of a research paradigm can be traced back to the philosophies of Plato and other philosophers who have contributed to the development of scientific thinking.

The research methodology employed in the study of stakeholder engagement in the water demand management strategy is based on a mixed-methods research design with a sequential exploratory mixed-methods design. The choice of a mixed-methods research design for studying stakeholder engagement in the water demand management strategy is influenced by the complexity and interdisciplinary nature of the issue.

3.2.1 Pragmatic (Mixed Method) Research

Pragmatic is a term used in research paradigms to refer to the philosophical underpinning of mixed-method research. This research approach is guided by the principle of using the method that works best to answer the research question(s). In a pragmatic paradigm, focus is not placed strictly on either qualitative or quantitative data, but rather the research question(s) dictate the methods and techniques used. Researchers adopting this paradigm believe in practical and 'action-oriented' solutions and, hence, they often employ multiple methods to derive data. So, in such studies, one would often find both numerical measurements and personal narratives as data to give a more rounded understanding of the research problem.

3.3 Research Design

3.3.1 Case Study

The approach to the research project was to focus on the Rustenburg Local Municipality's Water Conservation and Water Demand Management (WCWDM) strategy and assess whether it is inclusive of all stakeholders within the jurisdiction of the municipality. According to Robson (2002:178), "a case study is a strategy for conducting research that involves empirical investigation of a particular contemporary phenomenon within its real-life context using

multiple sources of evidence". The lack of stakeholder involvement has a detrimental impact on the successful implementation of the WCWDM strategy in the municipality. According to Welman and Kruger (2001), research should aim to examine the dynamics within a single bounded system, commonly associated with social entities like families, groups, communities, project participants, institutions, and practices. The case study approach is beneficial as it allows for theoretical propositions that guide data collection and analysis based on existing literature. Bryman and Bell (2011) point out that case researchers utilize various sources of evidence such as visual documents, interviews., questionnaires., field notes., participant observations., and recordings. In this scenario, data consists primarily of information gathered through an employee survey conducted within the organization being studied.

The utilization of case study methods presents several advantages. As stated by Zaidah (2007), this methodology allows for thorough examination and analysis of data within a specific context. Typically, case studies are conducted in small geographical areas or with a limited number of individuals as the subjects of study. True to its essence, case studies explore real-life phenomena through detailed contextual analysis of a few events or conditions and their interrelationships. The research concentrated on a select group of officials within the municipality, along with key stakeholders impacted by municipal decisions and strategies. Hence, employing the case study method is vital for conducting this investigation.

Yin (1984) argued that case studies come with their disadvantages, which can limit the researcher as they lack rigour and lead to the study allowing ambiguous evidence or biased views to influence the direction of the findings and conclusions.

3.3.2 Selection of Research Participants

Welman, Kruger, and Mitchell (2005) argue that the inclusion of all members of a group in a research study is neither practical nor economical. As such a sample of readily available and

willing stakeholders will be used. Face-to-face or virtual interviews were carried out with selected stakeholders and professionals who have knowledge of and direct or indirect participation in the water demand management processes to evaluate the understanding and opinions on stakeholder involvement in water demand management in Rustenburg Local Municipality. The list of identified participants for the study are as follows:

- Participants involved in bulk water supply in the Rustenburg Local Municipality (Water Boards)
- Participants involved in maintenance and operations (Municipal Officials)
- Participants from prominent industries that consume a lot of water (Mines), and
- A selection of other key individuals from the community within the municipality (Councillors).

3.3.3 Questionnaires

As stated by Brouwer and Bell (2011), participants complete questionnaires themselves using self-completion methods, which can take the form of mail, postal, or internet forms. One of the benefits of questionnaires is their affordability and ease of administration, as they are quicker and less costly than interviews. They also offer the convenience of being completed by participants without the influence of an interviewers' style or bias. However, they also have limitations, such as the absence of prompting or probing and the risk of anonymous participants who may not answer truthfully. Additionally, the researcher may not always know who completed the questionnaire, increasing the likelihood of fraudulent or inaccurate responses. "Questionnaires reach many people in the least time and cost if emailed or administered through the post" (Wisniewski and Stead, 1996:24). In this research, questionnaires were mailed to participants to ensure that participants know what questions to expect in the interview.

3.3.4 Severity and Comprehensive Questions

Using a combination of qualitative and quantitative approaches can be provide a more holistic understanding of the research topic and improve the validity and reliability of the findings (Irhandayaningsih, 2022). Severity questions in research methodology refers to questions designed to measure the severity or intensity of a phenomenon and can be used to gather quantitative data. Comprehensive questions on the other hand, are used to gain an extensive understanding of a research topic, possibly exploring multiple aspects or dimensions of it. The comprehensive questionnaire provides qualitative data as it allows for participants to provide more in-depth exploration of subjective experiences, opinions, perspectives, as well as social and cultural research methods.

3.3.5 Semi-Structured Interviews and Focus Groups

According to Schurink *et al*., (2011:409) "after the organisation and conversion of the data, researchers continued the analysis by getting a feel for the entire database". The researcher read through documentation readily made available about the WCWDM strategy of the municipality, including notes from the interviews conducted, which provided further insight into the research questions. According to (Brouwer and Bell, 2011), The moderator or facilitator is expected to guide an unstructured discussion without being too intrusive.

Brouwer and Bell (2011) argue that interviews provide several benefits, including organised data and accessibility to information. They further explain that focus groups offer the advantage of being less artificial and reducing the risk of exploiting participants or creating power relationships. While interviews provide consistency, they have several drawbacks, including the time-consuming nature of organising and recording them, which can impact the research timeline.

For this study, mixed-method interviews were conducted, emphasising the interviewer's active engagement and the necessity of providing the interviewee a voice (Mouton, 2000). Semi-structured interview questions were used, and initial interviews with municipal officials were conducted to solicit their perspectives on stakeholder management arrangements within the water demand management framework. According to Galletta (2013), semi-structured interviews are adequately planned to address specific issues connected to the phenomenon under study while allowing participants to give further context to the dissertation's primary subject. The research objectives and questions were used to structure the interview questions for both municipal officials and water demand management stakeholders. All municipal officials were asked the same questions during the interview. Stakeholders also had the same semi-structured questions for their interviews.

3.4 Research Techniques

The distinction between research techniques and research methods lies in their application. Research techniques refer to the strategies employed to collect data, while research methods encompass the entire data collection process. Although the semi structured interview technique was chosen for this research, other techniques offer alternative approaches that need be explored further.

3.4.1 Data Collection

According Mbedzi (2011:55), "to give clarity to the data collection, it is imperative that the profile of the participants be clearly described as the participant's background and personal experiences will affect how the participants respond to the research from their contextual reference". Leedy and Ormrod (2014) define data collecting technique in academia as a specific mechanism or approach used by the researcher to gather, alter, or analyse data. The

research used two approaches to collect data for this research, which are primary and secondary data collection.

3.4.1.1 Interviews

The primary data collection technique was done by in-depth face-to-face interviews which were characterised as semi–structured interviews. The interviews were administered using open and closed-ended questions, to make it easy and quick for participants to answer. Semi-structured interviews were chosen because they permit the researcher to encourage the interviewee to provide more information. Interviews either took place in the comfort of the participants designated office or were through Microsoft teams and lasted approximately 15 minutes. Interviews were conducted at a time and place convenient to the participant. Permission was sought to record the interview.

3.4.1.2 Secondary Data Sources

Secondly, the researcher collected data using secondary data collection which involves reviewing historical and existing documents such as water demand management strategy, Municipal water services bylaw, municipal water master plan, and bulk water services agreements. This assisted in understanding the philosophy and the history of the study area. Documents are a way to construct a specific version of events or processes and make a specific case out of a process or history (Flick, 2009). The advantage of the documents review is that they are quite inexpensive, and they are a useful source of background information.

3.4.2 Data Collection Tools / Instruments

The following instruments and tools were used during the data collection process:

a) Recording device
b) Microsoft teams
c) Pen and notebook

3.4.3 Content analysis

Content analysis is not just a method, but rather an approach that can have a significant impact on research. Brouwer and Bell (2011) stated that "content analysis is an approach to the analysis of documents and texts, that seeks to quantify content in terms of predetermined categories, and in a systematic and replicable manner". Transparency as a research method and an objective approach to analysis are among the advantages content analysis offers. The specific advantages of content analysis while maintaining the original meaning of the statements within the data analysed, notwithstanding the disadvantages, such as invalid references (Brouwer and Bell, 2011).

Schurink *et al*., (2011) indicate that data analysis is the process of bringing order, structure, and meaning to the mass of collected data. The research data gathered was manually analysed to evaluate the relationship between stakeholder involvement and water demand management strategies. This is because the researcher wanted to explore similarities and differences in individual participants' perceptions of challenges and possible solutions for managing water demand and their view on the current water demand management strategy of the municipality to enhance and improve water service delivery. The data collected was analysed by making sense of the text. The data was analysed using steps outlined by Schurink *et al*., (2011), which is organising and preparing data for analysis, wherein the researcher will, after data collection, save and store the data under a number for each participant and check if all the questions were answered. Secondly, data collection and preliminary analysis involve analysis of data during collection and data analysis away from the field. The recordings were analysed and transcription of each interview verbatim was done. Thirdly, data processing, in which the researcher organises data in file folders and then converts the files into relevant text units, such as a sentence for analysis. Finally, the data was conveyed through the packaging of what is discovered in the text.

Arranging the data into meaningful categories is the first step, according to Saunders, Lewis, and Thornhill (2000). The responses were used to categorise the research question. The evaluation and summarisation of the replies concerning the strategic objectives and water demand management framework was the following step. This served as an illustration of the effect of stakeholder involvement in water demand management in Rustenburg Local Municipality

3.5 Reliability, Validity, and Limitations of the Study

3.5.1 Reliability

Polit and Hungler (1993) refer to reliability as the degree of consistency with which an instrument measures the attribute it is designed to measure. Sekaran (1996), further expands reliability as to the degree to which an instrument always gives the same score when used to measure unchanging value. Clearly illustrating the need to increase the reliability of the measuring instruments. The research ensures that it assesses the role of stakeholder participation within the WCWDM strategy of the Rustenburg Local Municipality.

Saunders *et al*., (2003), state that reliability is a statistical concept that relates to consistency and dependability. Reliability must ensure consistency, while Sekran (2003), contends that the reliability of the question does not prove that the answers given reflect the participant's true feelings.

3.5.2 Limitations

The study assessed the role of stakeholder participation within the WCWDM strategy of the municipality in this case Rustenburg Local Municipality which was confined to the stakeholders and municipal officials within the municipality and its jurisdiction. The Municipality has three water boards supplying water to its customers and residents. The three water boards are Magalies Water, Rand Water, and the Rustenburg Water Services Trust.

The study is confined to the management and involvement of stakeholder participation and inclusion in the Water Conservation Water Demand Management strategy of the municipality. The participant's response was short, and other stakeholders gave brief and precise responses, and some had to wait for management approval before they could respond to the questionnaire.

3.5.3 Validity

The questions for the project have been crafted in straightforward language to ensure clarity and simplicity of comprehension. Furthermore, specific instructions have been provided to the participants on how to complete the questionnaires. Cohen (1995) defines validity as the degree to which an instrument adequately measures what it is supposed to measure in each context.

3.5.4 Sampling

One potential drawback of this approach is the risk of excluding important individuals from the selected sample. Additionally, explaining random sampling may be challenging, and it is most effective when there is a comprehensive and readily available list of the entire population for reference (Bryman and Bell, 2011). In its simplest form, random sampling gives every member in the population an equal opportunity to be included in the sample, with each individual sample size having an equal probability of being chosen (Bryman and Bell, 2011).

3.5.5 Ethical Considerations

Ethics is a system of principles that govern individual choices and actions, continuous decisions on right and wrongs, and it guides individual's requirements for protection of dignity of participants in the data collection and publication (Mouton et al., 2015). Ethics in research establishes guidelines that not only recognise value conflicts, but they also help articulate responsibilities of the researcher, sponsors, participants, and public (Akpabio & Esikot, 2014).

For this study, the participants were provided with an explanatory statement and a letter of informed consent.

Ethical concerns that were adhered to are discussed as follows:

i) Informed Consent

Research participants were fully informed about the study through an explanatory statement. The statement described the research purpose, the participants right to withdraw from the research without providing reasons, what the data will be used for and how it will be applied. The consent form formed part of the participant's statement and was discretionary upon the participants if they choose to willingly participate.

ii) Respect for anonymity and confidentiality

Confidentiality and anonymity are intimately related to the rights of beneficence, respecting, and ensuring participants dignity and fidelity (Akpabio & Esikot, 2014). If it happened that anonymity of the participants was inadvertently compromised, confidentiality was ensured, and any possible private information, trade information, and intellectual property was treated with absolute confidentiality. Privacy of the participants was guaranteed, they were assured of this, and that the research was for academic purposes.

3.6 Conclusion

This chapter illustrated the method of investigation utilised for this research study as well as the tools applied in the administration of the interviews. The methodology, data collecting mechanisms and sampling methods are discussed in this chapter. The next chapter illustrates the Water supply and demand management systems within the Rustenburg Local Municipality.

CHAPTER 4: RUSTENBURG LOCAL MUNICIPALITY SUPPLY AND DEMAND MANAGEMENT OVERVIEW

4.1 Rustenburg Supply System

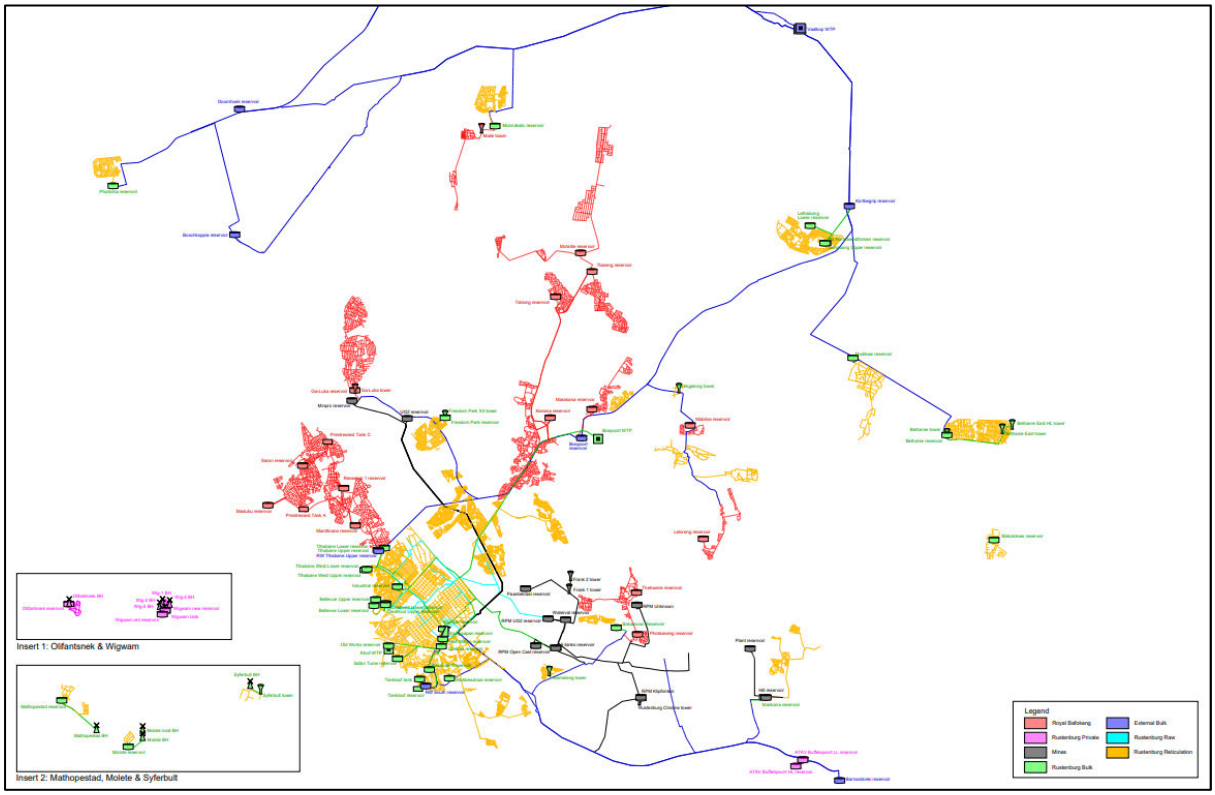

Figure 8: Rustenburg Local Municipality Water Supply System (Rustenburg Water Background and Master Plan Report, 2020)

RLM outsources the main function of providing water services and handles the retail aspect itself in most areas, except for mining residential areas and the Royal Bafokeng regions.

RLM serves as the WSA for its jurisdiction. It is a complex local authority with regards to water services. It receives external water supplies from two prominent Water Services Providers: Rand Water through the Barnardsvlei system and Magalies Water (MW) in conjunction with RW via the Vaalkop system. Additionally, RLM treats its own sewage and purifies a portion of its water through both the Bospoort Water Treatment Plant (WTP) and

Kloof WTP. Figure 8 illustrates the current supply schematic for the entire Rustenburg Jurisdiction.

The Rustenburg Water Services Trust has been appointed by RLM as another significant Water Services Provider within their jurisdiction. The trust is responsible for treating most of the sewage originating from the Rustenburg area (excluding the Royal Bafokeng Nation) and provides the technical support for the operations and maintenance of the Bospoort WTP and Kloof WTP.

4.2 Magalies Water supply

MW owns the Vaalkop WTP, with a capacity of 240 Mℓ/d Raw water is abstracted from the Vaalkop dam at the confluence of the Elands- and Hex Rivers (both part of the Crocodile River basin). The Vaalkop bulk water system distributes potable water from the Vaalkop WTP to various towns, mines, and private consumers. Raw water is abstracted from the nearby Vaalkop dam, treated, and then pumped via 5 pumping stations into the following 3 distinct systems:

1. The La-Patrie Sub System (Plant 1)

This system distributes water to the north of the Vaalkop WTP up to near Thabazimbi. The system also branches out to serve towns and consumers in a westerly direction as far as Phatsima. Most of the water conveyed via this system is first pumped into the La Patrie reservoirs. This system supplies water to Phatsima and Monnakato communities which form part of the Rustenburg Jurisdiction. This system also serves the Royal Bafokeng Nation (RBN) and town in Moses Kotana (RLM Water Master Plan, 2021).

2. The Kortbegrip Sub-system (Plant 2)

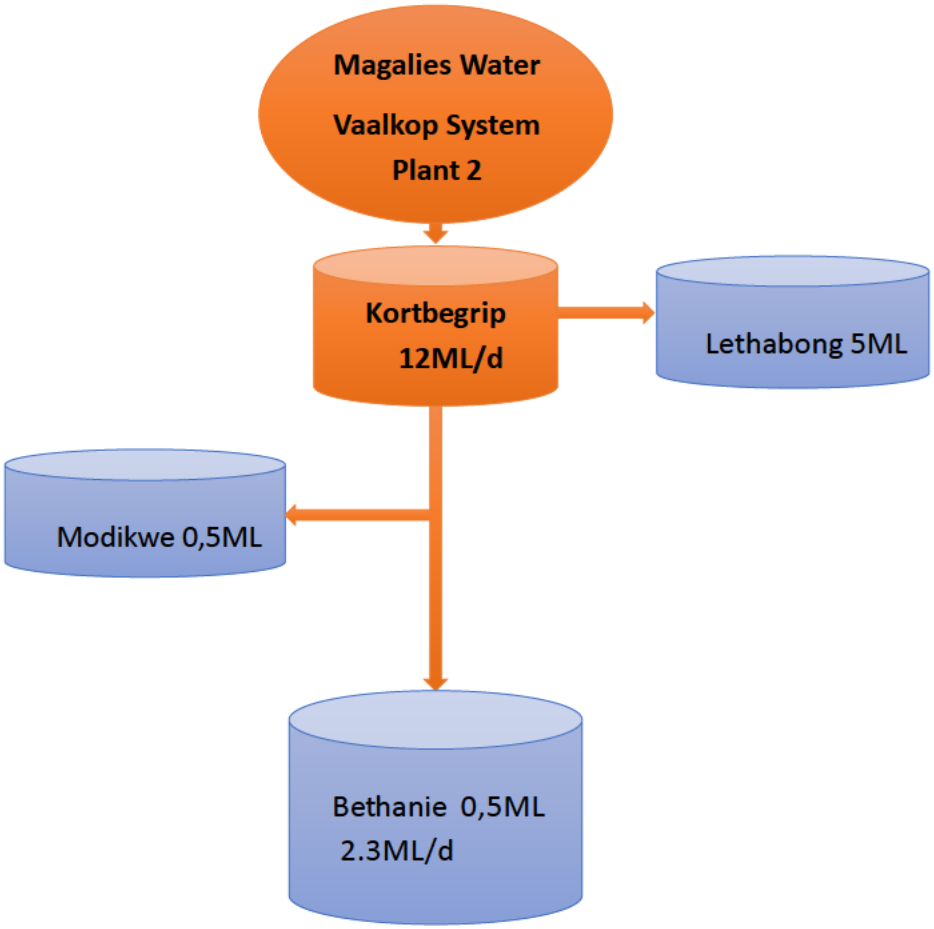

Figure 9: Magalies Water Korbegrip Sub-System (Plant 2)

A pipeline from Vaalkop water treatment plant supplies Mabitse, Rankelenyane, Tlapa and Leloreng. West of the Bospoort reservoirs a pipeline branches off the to supply Lesung via the Marakana reservoir (RLM Water Master Plan, 2021). This system has a capacity of 12Mℓ/day which does not meet the current demand. However, the system is currently going through an upgrade to 24Mℓ/day (RLM IDP 2022-2027, 2022).

3. The Bospoort Sub-System (Plant 3)

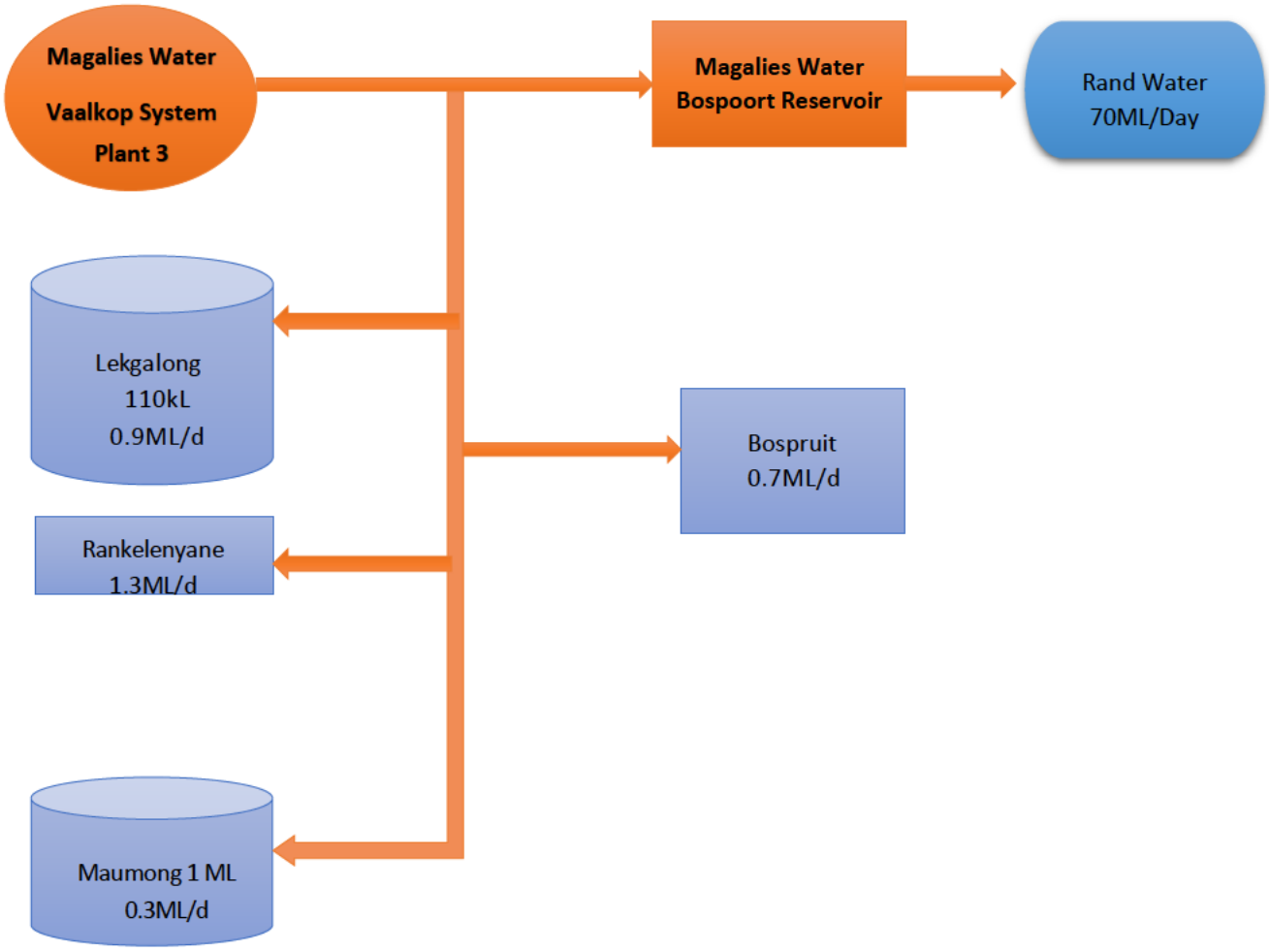

Figure 10: Magalies Water Bospoort Sub-System (Plant 3)

The Vaalkop South scheme involves a pipeline designed to supply water to the areas of Rankelenyane, and Royal Bafokeng Nation Surrounding areas. In Kanana, there is another branching point where a larger pipe connection supplies water to Kanana as well as other RBN areas such as Mafika, Serutube, Tsitsing, Maile extension, Maile3, Tlaseng, Mogajane, Motsitle, and Tantanana. The Rand Water/Magalies Water point of sale is situated on the south-western perimeter of Kanana settlement. (RLM Water Master Plan, 2021)

Demand exceeds supply on this scheme due to increased population growths and mushrooming of informal settlements. The operational capacity of the plant has been decreasing over time as illustrated in Figure 11.

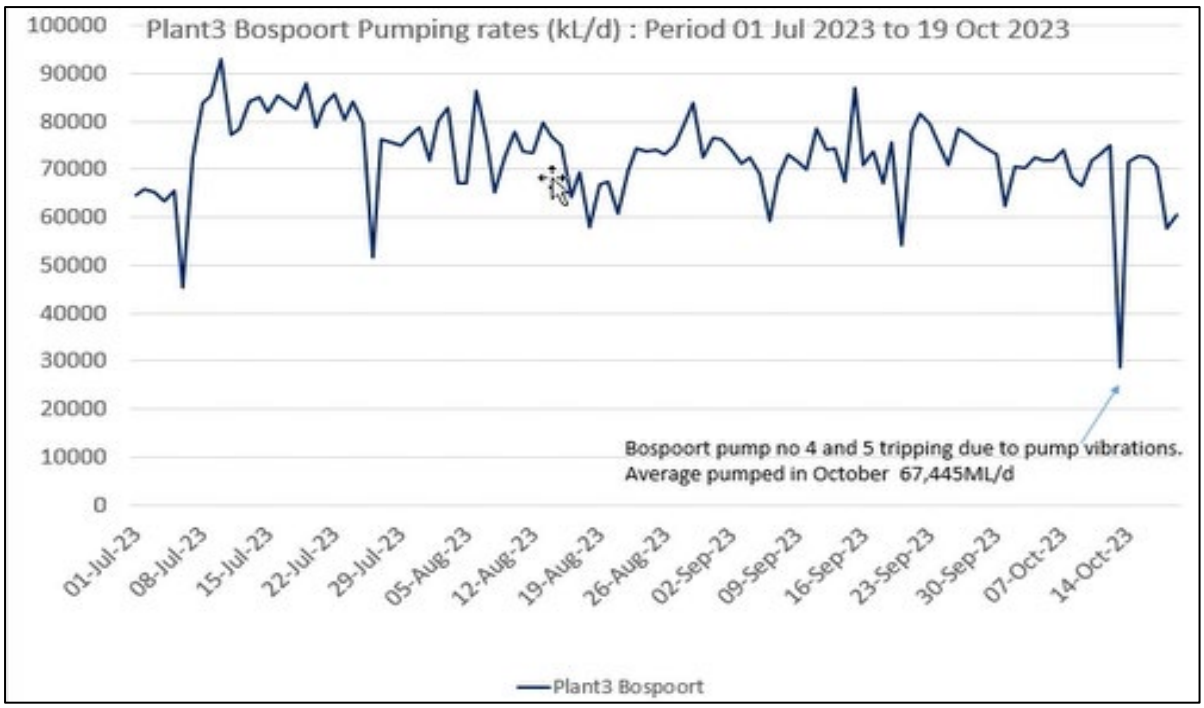

Figure 11: Magalies Water Plant 3 Bospoort Pumping Rate

4.3 Rand Water Supply

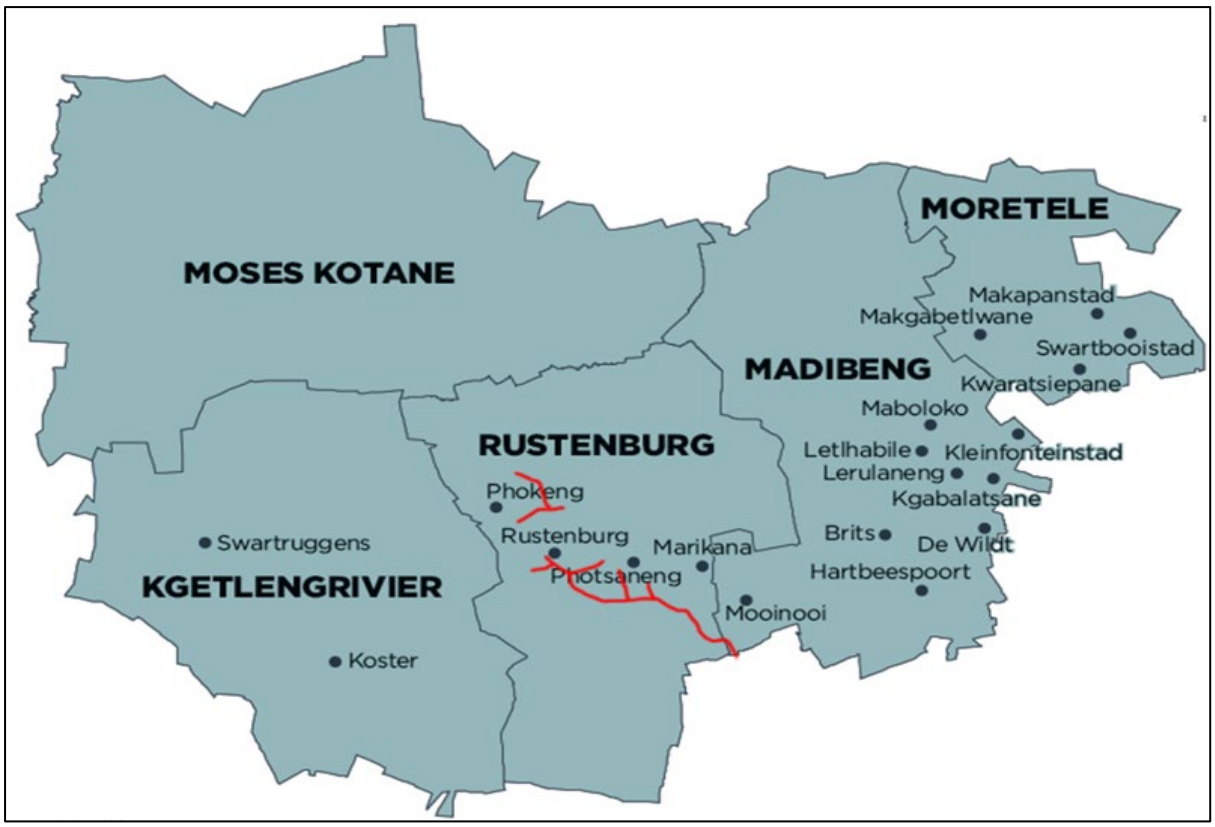

Figure 12: Rand Water Infrastructure into the Northwest (Rustenburg)

4.3.1 The Vaalk System (Rand Water)

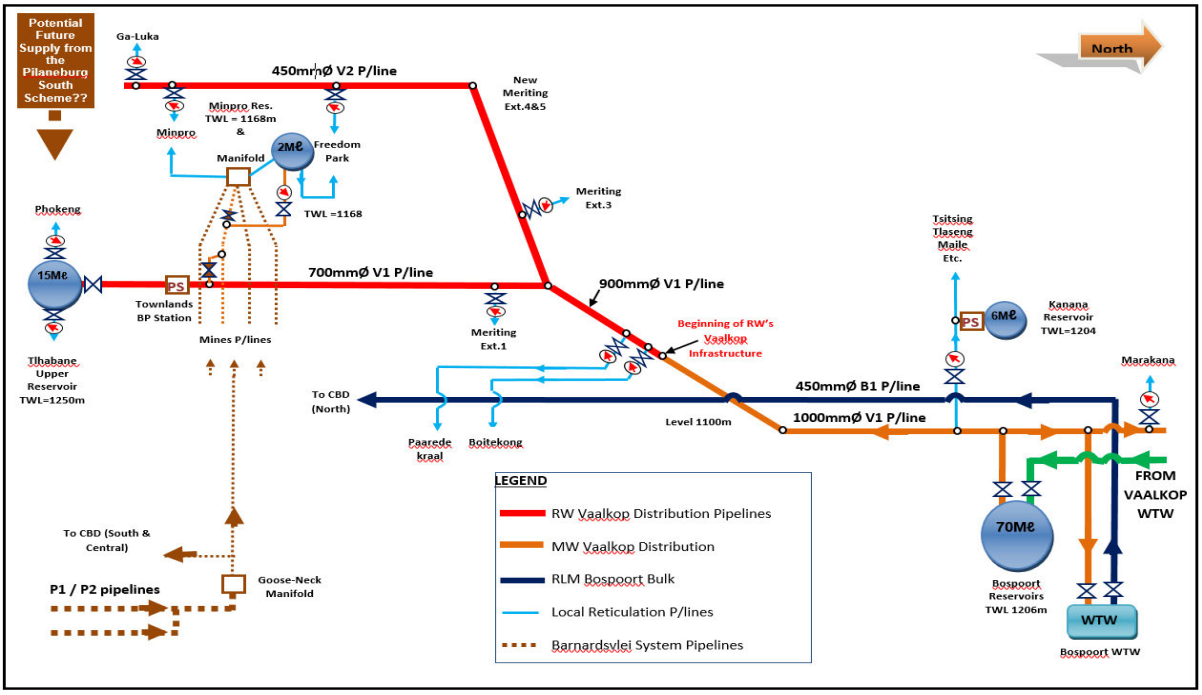

Figure 13: Vaalkop Rand Water Supply Schematic into the Rustenburg Local Municipality, (RW Water Supply Overview Presentation, 2023)

The first portion of the Scheme is managed and operated by Magalies Water from the Vaalkop Water Treatment Plant up to the point of sale supplying Rand Water. The Rand Water's portion of the Scheme starts at Meriting (point of sale) and from there Rand Water distributes water to the RLM, industries and RBN.

The Scheme was designed to produce maximum of 85 Mℓ/d and Rand Water is contractually allocated a peak day demand of 77.9 Mℓ/d or 55.2 Mℓ/d annual average. Due to the reduced capacity at the Vaalkop plant and the increased demand on the system, the supply does not meet the Rustenburg demand.

Valkop System Water Supply to RLM, RBA, Mining and Industrial (Mℓ/d)

RUSTENBURG LM (DOMESTIC)	2019	2020	2021	2022	2023
PAARDEKRAAL 279 JQ	4.80	5.19	5.23	5.18	5.10
MERITENG EXT 3	1.71	1.92	2.18	2.41	2.83
MERITENG EXTENTION 1	17.19	19.02	18.46	16.01	13.07
BOITEKONG/RUSTENBURG EXT 13	21.27	18.16	18.55	18.96	17.14
THLABANE UPPER RESERVOIR	0.11	0.12	0.12	0.17	0.20
FREEDOM PARK	5.21	5.03	5.00	4.86	3.92
FREEDOM PARK	0.46	0.34	0.56	0.55	0.57
FREEDOM PARK EXT 4	0.52	0.67	0.67	1.12	1.77
MERITENG EXT 4 AND 5	0.61	0.65	0.86	1.22	1.68
Totals	**51.88**	**51.09**	**51.64**	**50.47**	**46.28**

RORAL BAFOKENG AD (DOMESTIC)	2019	2020	2021	2022	2023
GALUKA RES	4.37	5.16	5.27	5.16	5.73
PHOKENG	0.01	0.02	0.02	0.02	0.03
PHOKENG ADDITIONAL METER	11.23	9.59	8.57	6.56	6.47
Totals	**15.61**	**14.78**	**13.86**	**11.74**	**12.23**

MINING AND INDUSTRIAL	2019	2020	2021	2022	2023
Totals	**1.59**	**0.49**	**0.20**	**0.13**	**0.01**

Total Consumptions	69.09	66.35	65.70	62.34	58.52

Figure 14: Vaalkop Rand Water System Consumption Trend, (RW Water Supply Overview Presentation, 2023)

Table 4.1 - V1 and V2 Original Installtion and Capacity Detail				Short-Term(2001)		Medium Term (2005)		Long Term (2010)	
Pipe Section	**Pipe Length (m)**	**Size/Material**	**Date Laid (year)**	**PDD (Mℓ/d)**	**GAADD (Mℓ/d)**	**PDD (Mℓ/d)**	**GAADD (Mℓ/d)**	**PDD (Mℓ/d)**	**GAADD (Mℓ/d)**
V1 Pipeline	11,000.00	1000mm X42 Steel 900mm X42 Steel 700mm X42 Steel	1999	44.9	30.7	48.3	31.9	59.5	40.3
V2 Pipeline	12,000.00	500mm X42 Steel 450mm X42 Steel 400mm X42 Steel	1999	11.7	7.1	14.6	11.8	18.5	14.8
			Totals	**56.7**	**37.8**	**62.8**	**43.6**	**77.9**	**55.2**

*** Note: For construction and/or design purposes: Installed pipe details must be verified on site.**

Figure 15: Infrastructure Capacity, (RW Water Supply Overview Presentation, 2023)

V1, V2 pipes were initially designed for a Peak Daily Demand of 77.9 Mℓ/d. The total long-term capacities of both the V1 and V2 pipelines were also the abstraction quotas contracted between Magalies Water and Rand Water in 2000. The contracted average abstraction quota (Gross Annual Average Daily Dema–d - GAADD) of 55.2 Mℓ/d was reached in 2010, as envisaged. The actual average abstraction quota already reached 65Mℓ/d by 2013.

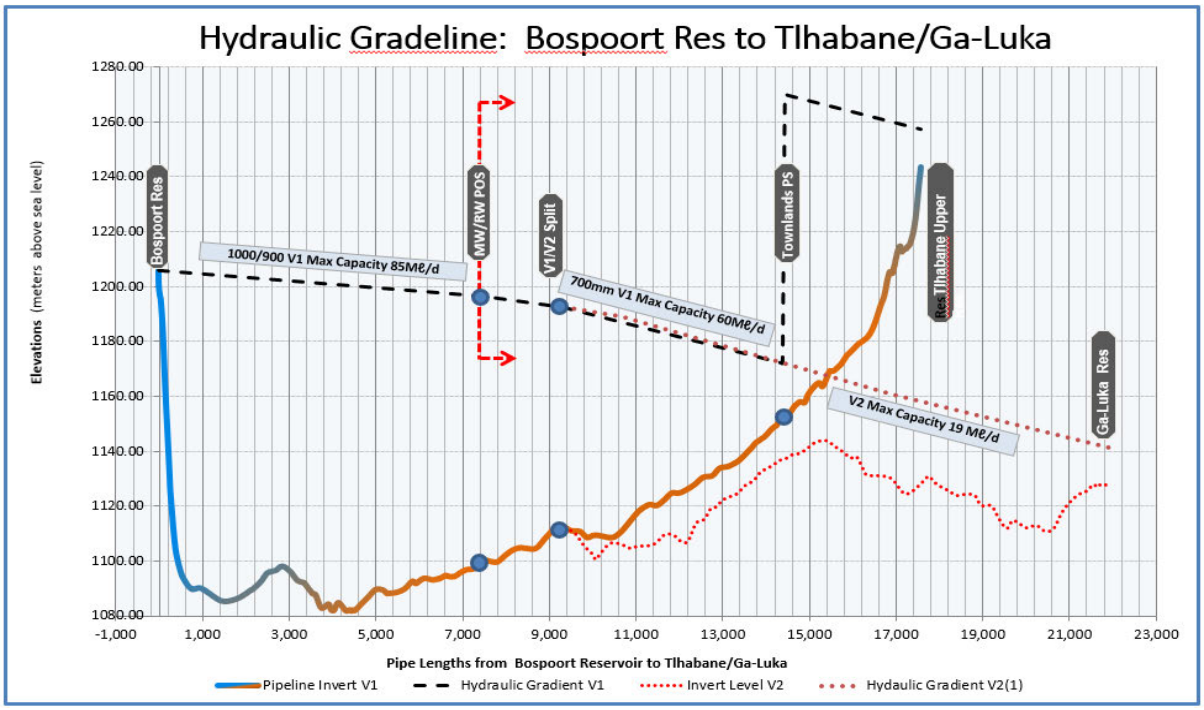

Figure 16: Vaalkop Rand Water System Infrastructure Performance, (RW Water Supply Overview Presentation, 2023)

4.3.2 Rand Water Barnardsvlei System

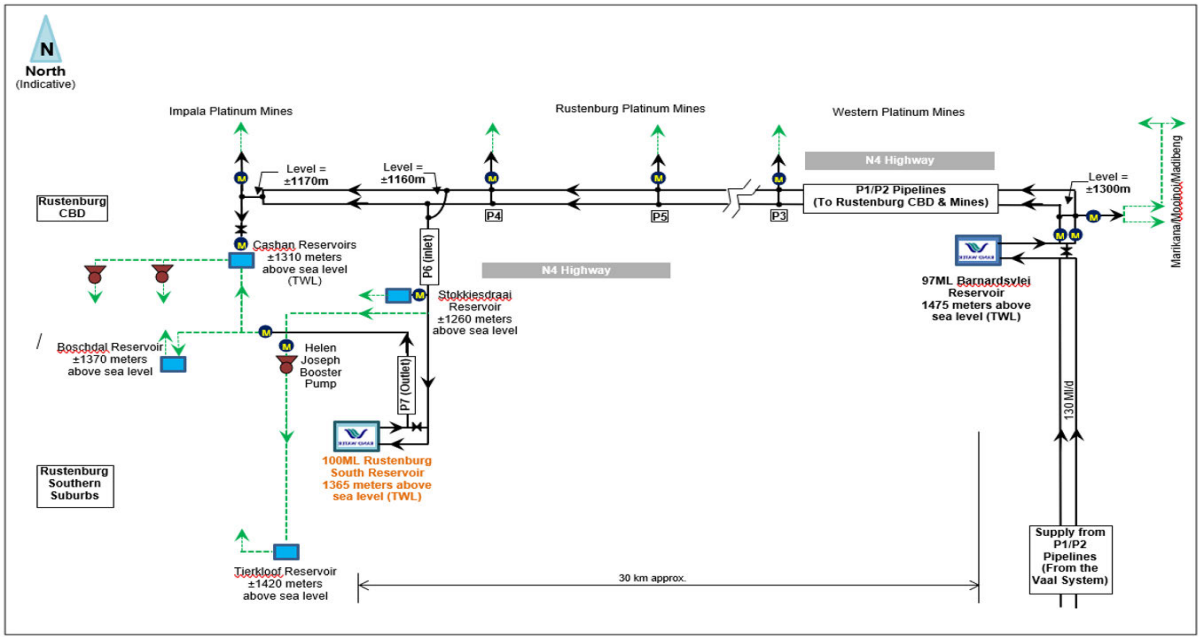

Figure 17: Rand Water Barnardsvlei Supply Schematic, (RW Water Supply Overview Presentation, 2023)

The Rand Water Banardsvlei supply system illustrated in Figure 17, was commissioned in the 1970s, supplying potable water to Rustenburg. (RW pipe lifespans are 65 years – dependant on condition). Total maximum design capacity of this system is 130 Mℓ/d. Rand Water initiated and commissioned an additional 100Mℓ storage, Rustenburg South Reservoir after all the major mine offtakes on, to augment the 97Mℓ Barnardsvlei Reservoir. Alone the Barnardsvlei Reservoir was unable to sustain the Rustenburg's peak demands however the introduction of the Rustenburg South Reservoir demonstrated a significant improvement in water supply particularly in the Rustenburg CBD.

However, the introduction of the Rustenburg South Reservoir alone was not adequate as it was not providing additional water supplies to the system, it only assisted with demand and operations optimisation. This system still faces challenges in increased demand for water during summer seasons when households are using more water as well as industries.

Barnarsdvlei Water Supply to RLM, RBA, Mining and Industrial (Mℓ/d)

RUSTENBURG LM (DOMESTIC)	2019	2020	2021	2022	2023
VILLAGE OF POTSANE THEKWANE AND M	2.44	2.34	1.62	2.09	2.98
PORTION 1 OF THE PLOT 22 WATERVAL S	0.00	0.00	0.00	0.00	0.00
`	6.04	1.48	0.01	0.00	0.00
RUSTENBURG RESERVOIR BACKWASH	0.00	0.00	0.00	0.00	0.00
PORTION 345 KAFFERSKRAAL 342 JQ	0.13	0.13	0.12	0.25	0.35
STOKKIESDRAAI RESERVOIR	2.31	2.10	1.78	2.18	3.08
BOSCHDAL	7.21	6.73	6.79	6.43	6.47
BOKAMOSO METER	0.64	1.62	2.26	2.51	2.93
IKEMELENG TOWNSHIP	0.60	0.75	0.77	0.85	1.01
CASHAN RESERVIOR	14.95	17.13	15.62	18.76	26.34
FARM RIETFONTEIN 338(REMAINING EXT	0.01	0.06	0.07	0.09	0.07
N4 SHELL KROONDAL	0.00	0.00	0.01	0.01	0.01
KAREE MINE	6.94	7.60	7.67	7.75	9.76
Totals	41.27	39.95	36.71	40.92	52.99

MINING, INDUSTRIAL & PVT	2019	2020	2021	2022	2023
Totals	69.95	65.41	65.70	66.39	66.74

Total Consumptions (North West- RLM)	111.22	105.36	102.41	107.30	119.73
Total Demand (P1 + P2)	120.00	114.00	109.00	115.00	129.00

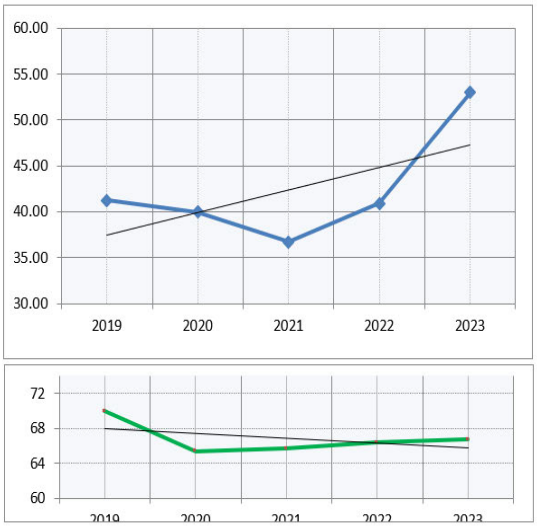

Figure 18: Wand Water Barnardsvlei Water Supply Trend, (RW Water Supply Overview Presentation, 2023)

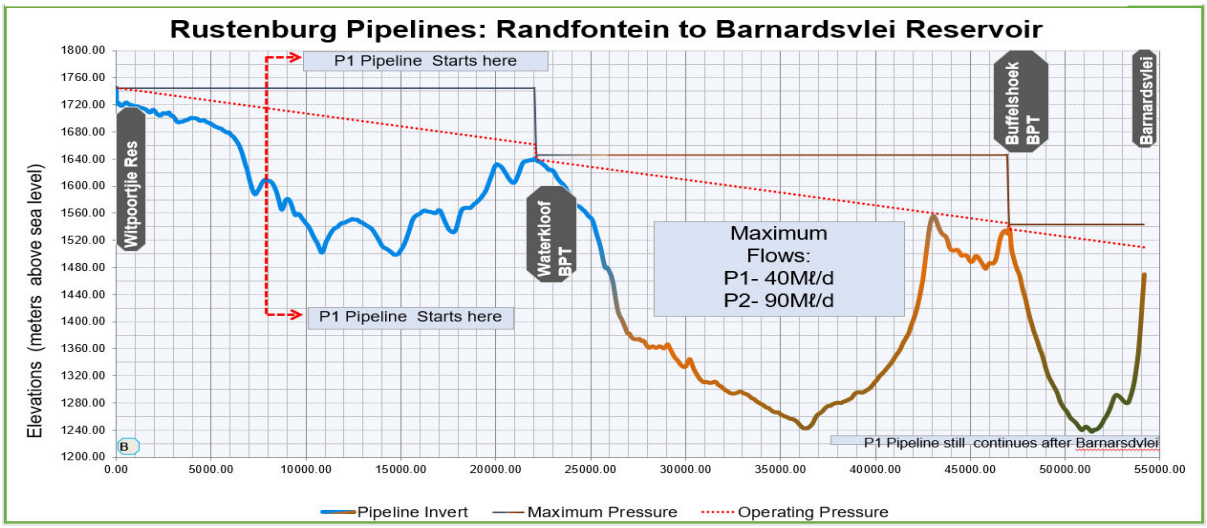

Figure 19: Rand Water Barnardsvlei System Infrastructure Performance, (RW Water Supply Overview Presentation, 2023)

4.4 Rustenburg Water Services Trust supply

Rustenburgs' own water sources are:

- The Bospoort dam and WTP, with a capacity of 12 Mℓ/d (an additional 12Mℓ/d is still underway).
- The Kloof WTP in Dorpspruit, with a capacity of 2 Mℓ/d.

Water from Rustenburgs' own source is generally less expensive than water purchased in bulk from RW and/or MW. The Rustenburg Local Municipality Water Plants are operated and maintained by the Rustenburg Water Services Trust (RWST) who has appointed Water and Sanitation Services South Africa (WSSA).

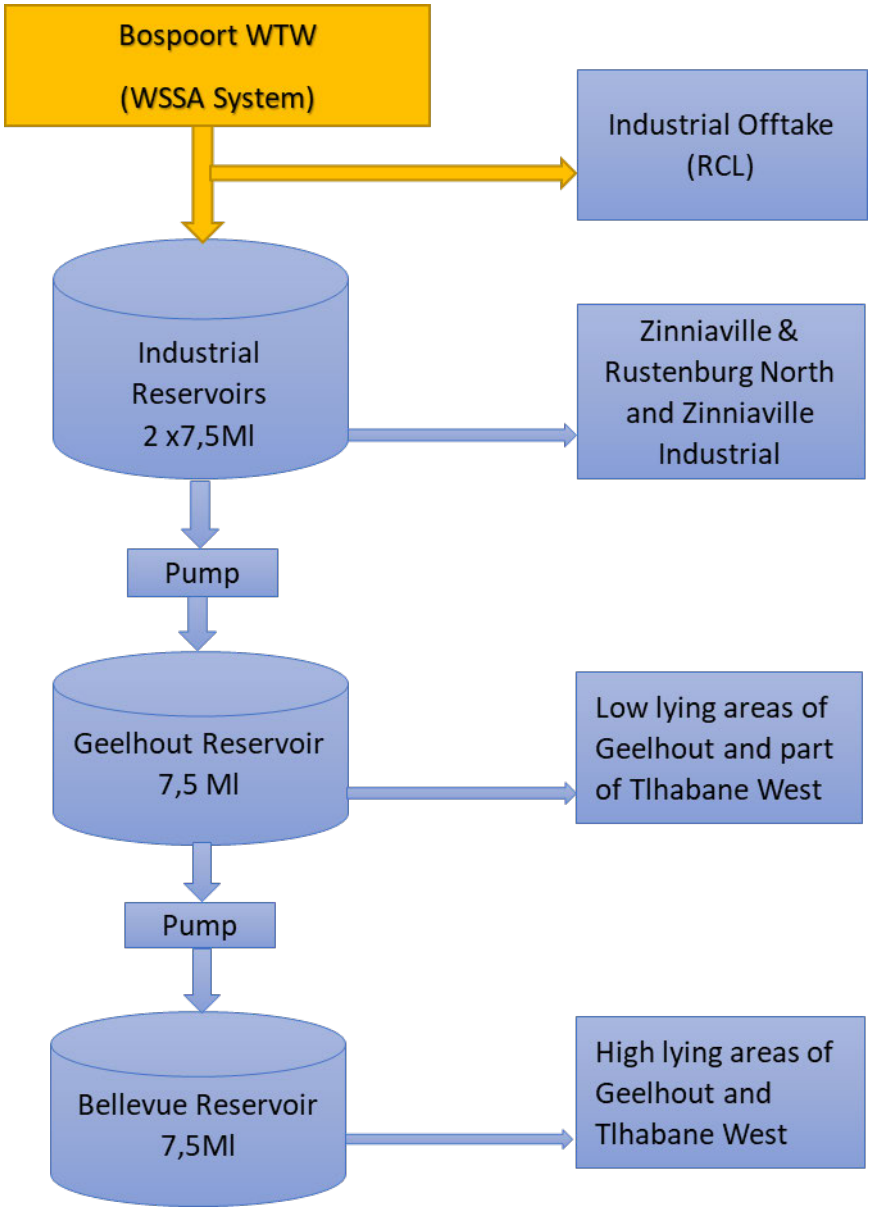

Figure 20: Bospoort WTP Supply System

4.5 Conclusions

This chapter outlines the current supply and demand of water in the Rustenburg Local Municipality. The different water supply schemes are illustrated in this section. The next chapter deals with the results collected during the research interviews.

CHAPTER 5: RESULTS

5.1 Data Interpretation and Presentation

The data obtained from the participants were structured in two sections, including all stakeholders. The interview presented severity and comprehensive questions, with the following responses on a scale of 1 to 5, where 1 strongly disagreed and 5 strongly agreed, indicating the extent to which the participants agreed or disagreed with each of the statements. Section B of the interview included comprehensive questions where participants were given the opportunity to elaborate on the severity of their answers. However, it is important to note that those who scored the least (1), meaning that they disagree, were considered dissatisfied with the overall performance of the Rustenburg Local Municipality for this research. This response was interpreted as a failure to implement a water demand conservation strategy that included all stakeholders and players within the municipal jurisdiction. The following data were interpreted for each question.

5.2 Stakeholder Interview

The following responses were recorded from a sample of six (6) stakeholder participants:

5.2.1 Section A: Severity Interview

Statement 1: All stakeholders are included in the current water demand management strategy.

Table 3: All stakeholders are included in the current water demand management strategy.

INTERVIEWEE	LEVEL OF AGREEMENT				
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1 (waterboard)					X

2 (waterboard)					X
3 (mine)		X			
4 (councillor)			X		
5(waterboard)					X
6 (councillor)					X
Total	0	1	1	0	4

Table 3 indicates the distribution of responses, with four out of six (4/6) participants strongly agreeing, one (1) participant identifying as neutral, and one participant from the mining sector disagreeing that all stakeholders are included in the WCWDM Strategy. Based on the data collected, it can be concluded that most stakeholders involved in the current water demand management strategy believe that all relevant stakeholders are included in the strategy. The objective of data collection was to evaluate the level of stakeholder involvement in the water demand management strategy of the municipality. It was essential to identify if all stakeholders are included in the current water demand management strategy. In this section, the current water demand management stakeholders were asked if all relevant stakeholders are included in the current water demand strategy. However, it is important to note that there is still a significant percentage of stakeholders who either expressed neutrality or disagreement. It is therefore crucial to identify those stakeholders who feel excluded or have concerns regarding the inclusion of all relevant stakeholders to address their issues and improve the overall effectiveness of the water demand management strategy.

Statement 2: The formal agreement manages the relationship between municipalities and stakeholders.

Table 4: The Formal Agreement Manages the Relationship Between Municipalities and Stakeholders

INTERVIEWEE	LEVEL OF AGREEMENT				
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1 (waterboard)					X
2 (waterboard)					X
3 (mine)	X				
4 (councillor)		X			
5 (waterboard)					X
6 (Councillor)					X
Total	**1**	**1**	**0**	**0**	**4**

Participants were asked if there is an official agreement that governs the relationship between themselves and the municipality. According to the responses of the survey illustrated in Table 4, most stakeholders in the Rustenburg Local Municipality (4/6) strongly believe that there is an official agreement governing the relationship between the municipality and stakeholders. However, one (1) participant strongly disagrees with this statement regarding the Water Services Bulk agreement, which they feel does not cover all stakeholders within the municipality affected by its water conservation and demand management strategy. Additionally, one (1) of participants expressed disagreement with there being no contractual arrangement in place with councillors who represent communities impacted by these initiatives. Specifically, one stakeholder representing a mining company, operating within Rustenburg, claims that while there is a contract between their mine and water boards, no such contract managing their relationship with the municipality exists. The prevalent assumption is

that there is no legal contract/agreement in place that governs water-demand interactions with the municipality.

Statement 3: You play a key role in the municipality's water demand management strategy.

Table 5: You Play a Key Role in the Municipality's Water Demand Management Strategy.

INTERVIEWEE	LEVEL OF AGREEMENT				
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1 (waterboard)					X
2 (waterboard)					X
3 (mine)			X		
4 (councillor)			X		
5 (waterboard)					X
6 (councillor)					X
Total	0	0	2	0	4

Participants were then asked if they play a key role in the municipality's water demand management strategy, and their responses were illustrated in Table 5. According to Table 5, four out of six (4/6) participants strongly affirmed that they play a key role in the municipality's water demand management strategies, while the rest remained neutral. These results imply that a significant portion of the stakeholders are not involved in the municipal water demand management strategies. Furthermore, most stakeholders are not well informed about the municipality's water demand management strategy. This lack of information and knowledge can negatively impact the effectiveness of a strategy's implementation and management.

Statement 4: There is sufficient stakeholder balance in the municipality's water demand management strategy.

Table 6: There is sufficient stakeholder balance in the municipality's water demand management strategy.

INTERVIEWEE	LEVEL OF AGREEMENT				
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1 (waterboard)			X		
2 (waterboard)				X	
3 (mine)			X		
4 (councillor)		X			
5 (waterboard)					X
6 (councillor)					X
Total	0	1	2	1	2

To establish the balance within the water demand management strategy, stakeholders were asked if there is a sufficient stakeholder balance in the municipality's water demand management strategy. Table 6 shows that two out of six (2/6) participants strongly agreed that there is a sufficient stakeholder balance in the municipal WCWDM strategy, while one (1) disagreed and indicated that the strategy is not inclusive and lacks consultations to seek input and guidance. Furthermore, one (1) of the participants partially agreed that there is a balance in the municipalities WCWDM strategy, while two (2) participants were neutral to the statement.

Statement 5: Your involvement improved the municipality's water demand management strategies.

Table 7: Your involvement improved the municipality's water demand management strategies.

INTERVIEWEE	LEVEL OF AGREEMENT				
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1 (waterboard)				X	
2 (waterboard)			X		
3 (mine)		X			
4 (councillor)			X		
5 (waterboard)					X
6 (councillor)					X
Total	**0**	**1**	**2**	**1**	**2**

Stakeholders were asked how their involvement improved the municipality's water demand management strategies. Table 7 demonstrates that two out of six (2/6) participants strongly acknowledged that their involvement would have positively impacted the municipality's Water Demand Management Strategy. Conversely, one (1) out of the six (6) participants from a mining house disagreed with the notion that their participation was sought in the formulation of the plan, indicating that they were not included or consulted during their development stage. One (1) participant from a waterboard agreed that their limited participation in operational matters contributed to the effectiveness of the Water Demand Strategy of the municipality. Finally, two out of six (2/6) of the participants opted to remain neutral and did not express their views on the impact of their involvement in the plan.

5.2.2 Section B: Stakeholder Comprehensive Interview

The following responses were recorded from a sample of six (6) stakeholder participants:

Question 1: Are all stakeholders involved in the water demand management strategies of the municipality, and to what extent?

This question aimed to determine the inclusivity of the municipal strategy and assess the extent of participation of all stakeholders. Responses were used to evaluate the effect of participation. DWS mandates that a municipality must endorse and execute a water demand management and conservation strategy through the Water Services Act.

- The Department of Water and Sanitation, in its capacity as custodian of the Water Services Act of South Africa, is charged with the management, protection, and preservation of the country's resources. The implementation of a water demand conservation strategy by water service authorities is mandated by the Water Services Act and is considered necessary to conserve and preserve water resources for the benefit of all dependent on the resource.
- To promote a comprehensive and inclusive approach to water demand management and conservation, the water demand management strategy was incorporated into the Integrated Development Plan of the municipality as a requirement for municipal legislation.

The participants responded as follows:

"Yes, we are involved in all aspects because when the strategy is formulated, one would want input from different stakeholders. We are 100% involved in drafting the strategy." **WB1**

"Yes, we are involved in terms of making sure that firstly we comply with the prescripts of the contract in terms of meeting the agreed quota to who are involved making sure that in the event of where supply or demand is not met, we provide alternative services in terms of augmenting supply through tinkering. We are involved at the technical level in making sure

that the technical teams are coordinated to deal with the coordination of the demand management." **WB2**

"Not necessarily, as a stakeholder and to be more specific, as a mining industry within the Local Municipality, we do not participate in the decision making and, the mine has little to no contact with the municipality when it comes to water demand management plans because we get our water supply directly through the water board. But, in cases where there are issues with the water supply, we do engage with the municipality through a WhatsApp group." **Mine**

"I have worked with both the RLM maintenance and bulk water teams at various levels (i.e., level demand management, leak detection, leak prevention and maintenance). I am definitely very involved and very hands-on. We are however faced with many challenges which affect the actual resolution of issues." **WC1**

"Yes, I am involved, and my involvement is embedded in the supply of bulk water to the municipality as well as monitoring water losses to manage the reservoir levels. Using telemetry interventions, we can monitor the flows to the reservoirs and ensure that the offtakes are closed and monitored." **WB3**

"My involvement can be seen as a communication between the institution and residents to keep them informed on a regular basis about the challenges that the municipality is facing as a water authority, the water supply being managed by the municipality to the residents and also trying to establish and also make sure that residents are using water sparingly so that we can actually understand the demand of water." **WC2**

It is notable from the responses that all stakeholders were knowledgeable of the water demand water conservation management strategy and the mandate of the Department of Water and Sanitation, which necessitates the implementation of such a strategy. All the participants

provided an accurate understanding of the strategy and its importance. Additionally, each participant clearly defined their role in the strategy and discussed their involvement in its implementation. Regrettably, it was discovered that other stakeholders were unfamiliar with the strategy and believed that they were not involved in its formulation or implementation. This suggests a lack of communication between municipalities and other stakeholders in their jurisdictions.

Question 2: How does the formal agreement in place manage the relationship between the municipality and stakeholders, and how do you ensure that this agreement is adhered to?

This research suggests that if a municipality adopts a collaborative, informed, and inclusive water demand management strategy, challenges must be addressed in the Rustenburg Local Municipality. The following responses from knowledgeable participants were recorded:

"… the bulk water contract has multiple clauses that govern the relationship..." **WB1.**

"We coordinate meetings where we check key performance areas..." **WB2.**

"… the mine only has a legal agreement in place with the water board, and there is no official agreement that governs the water demand interaction between the municipality and the mine …" **Mine**

"The current agreements that are in place between the water boards and the municipality do not leave room for investigation and question purely on the basis that the water boards take the stance of a service provider and the municipality is the client… representatives within our relevant constituencies are not entitled to certain information. The relationship needs to be more inclusive… The lack of transparency causes a lot of conflict between the water boards, municipality, and public representatives." **WC1**

"We hold monthly meetings where we discuss the issues relating to water demand, water losses and reduction percentages. Rustenburg has 2 water treatment plants, namely Bospoort WTP with a capacity of 12Mℓ/Day and Kloof WTP with a capacity of 2 Mℓ/Day." **WB3**

"The agreement ensures that residents are not misinformed and that they understand the challenges that the city is facing and make sure that the demand is managed well so that we do not lose key reservoirs in the city due to the continued water supply challenges that we are faced with." **WC2**

The responses from knowledgeable participants highlight the importance of collaboration, informed decision-making, and inclusivity in water demand management strategies. These strategies require effective communication and cooperation between various stakeholders, such as water boards, government, mines, and public representatives. They also emphasise the need for transparent agreements and information sharing to foster trust and prevent conflicts. Furthermore, it is crucial to have regular meetings and discussions to address issues related to water demand, losses, and reduction percentages.

Question 3: What role do you play in the Water Conservation Water Demand Management Strategy of the Municipality?

This study aimed to evaluate the level of participation and contribution within the WCWDM strategy of a given municipality. Various stakeholders have outlined their roles and responsibilities, which are often more complex and contingent on agreements between the municipality and these stakeholders.

"My role is more in the communication aspect to ensure that the municipalities are informed on and facilitate any meetings that need to take place." **WB1**

"Strategically we may not be directly involved, but we ensure that water as a resource plays a part in the economy in leading the economy of the local municipality which is one of your

strategic imperatives particularly with the local economy and development and there at the higher level. We are also working together in terms of dealing with the issue of the district development model and especially in identifying projects that will assist the municipality in meeting its obligation as a water service authority, and that rule on its own is strategic." **WB2**

"The mine does not play a direct role in the planning or implementation of the water demand management strategy put in place by the municipality. However, during water shortages or when demand exceeds supply, the mine reduces consumption with continued communication with the municipality and the water boards." **Mine**

"…My actual only strategy in the water demand management of the Municipality is purely on an oversight level." **WC1**

"We also make sure that the quality supplied meets the required quality standards so that 'here won't be water losses." **WB3**

"… We ensure that there's transparency between the municipality as well as the water demand that is being managed for communities as well as the institution to understand what certain challenges are …" **WC2.**

The findings offer various responses reflecting the multifaceted projections of the roles various entities play in the Water Conservation Water Demand Management strategy of a municipality. The analysis presents an interplay of direct and indirect roles, each contributing differently towards achieving sustainable water management.

Question 4: How can stakeholder balance in the municipality's Water Conservation Water Demand Management strategy be improved?

This research aims to identify methods for enhancing stakeholder involvement and participation in a municipality's Water Demand Management strategy. The crux of the matter

is the need for inclusive participation from all stakeholders who are affected by the strategy and reside within the municipality. The following suggestions are put forward by all stakeholders regarding how the municipality can improve the stakeholder balance within its jurisdiction:

"… improvement would be more on the sharing of the document on its own. My understanding is that the strategic document will have to go to different structures within the municipality for approval. So, after it has been approved, it will be ideal if it's shared with different stakeholders so that when you start implementing' you don't get resistance because there will be a common understanding." **WB1**

"… ensuring that the implementation and monitoring are done accordingly, and all stakeholders participate in either contributing towards the effort or meeting the demand in the area …" **WB2.'"…** ***There's a need for us in terms of demand management, to balance the socioeconomic requirements."*** **WB2**

"… the first step to improving the water demand management strategy is to include all the relevant stakeholders in the decision-making and of course the planning of the water demand management plan. I believe that the mine might have specialised skills and resources that can contribute valuable assistance in developing and implementing water demand management strategies." **Mine**

"It needs to be more inclusive and more buy in from public representatives. There is a very inaccurate balance when it comes to sitting in various meetings related to water demand and maintenance. I feel that the municipality and public reps are outnumbered by the representatives from the water boards hence I perceive that they tend to force their will on us. There needs to be more skilled representation from the municipalities side to sit there and call out the water boards if they are giving us the run-around." **WC1**

"The municipality as the water services authority, needs to have all powers in the distribution of water within its jurisdiction in order to manage the water demand effectively." **WB3**

"… regular meetings in order for us to address infrastructure challenges that need to be able to address the future demand plans that the municipality has and proper planning for future upgrades of current infrastructure to avoid dilapidation of infrastructure that contributes to water losses within the municipality." **WC2**

The findings present various thematic insights such as inclusivity, transparency, collaboration, resource allocation, and power dynamics in the stakeholder balance within a municipality's Water Demand Management strategy.

Question 5: How has your involvement improved the Water Conservation Water Demand Management strategy of the municipality?

The research question aims to investigate the influence of stakeholder participation on a municipality's WCWDM strategy by evaluating the existing impact of stakeholder involvement, analysing its contribution to a municipality's strategy. The following are the typical contributions and involvement of stakeholders within the municipality's WCWDM strategy:

"… communication that we have has drastically improved the way we work and do things and in terms of the water demand management strategies." **WB1**

"Our involvement is positive, but there's still much room for improvement and a lot of work to be done. The weekly sessions or the previous engagements were also good. Our meetings daily to some extent played a part and we were involved. However, there are gaps that need to be to need to be closed, especially in making sure that all stakeholders participate consistently, and that we all share in the pain of this demand management. There's largely still much work that needs to be done." **WB2**

"We currently recycle at least 40% of our water usage through the implementation of advanced water treatment technologies. This has reduced the strain on the municipalities' scarce water resources and contributed to the overall water demand management strategy. Also, we have implemented water-saving initiatives that reduce water consumption by promoting practices and technologies that use less water within our operations and company houses. These initiatives have contributed a lot, especially on the municipality side because we now take less than our allocated water supply." **Mine**

"We are still in a situation where our demand outweighs our supply and that is due to rapid economic growth and a lot of expansion within the municipality. My personal involvement is more aligned to the water network maintenance works as I work hand in hand with the teams. But I do not think that the Water Demand Management Strategies have yet yielded results. We still have a long way to go, and we are hampered by various issues within the municipality and water boards before we can get to the point where I would be comfortable to say there is a definite turnaround and improvement in Water Demand Management." **WC1**

"We have increased the grey water supply to industries by 2Mℓ/annum. We are continuously encouraging mines to take more grey water as opposed to utilising potable water in their operations." **WB3**

"Being there to play an opposition oversight to put pressure on the ruling administration to improve in the position to continuously upgrade and invest in local infrastructure, as well as making sure that we plan." **WC2**

It has been noted that there has been an improvement in communication between municipalities and stakeholders, and it has been suggested that there is room for further improvement.

Contributions such as recycling water and reducing the demand for potable water by producing more grey water that is supplied to industries and mines are all initiatives of the WCWDM strategy of the municipality. The consensus is that these are all significant contributions to the WCWDM strategy of the municipality.

Oversight (participants emphasised that their contributions of playing an oversight role assist by enhancing accountability and proper implementation of the WCWDM strategy of the municipality

5.3 Municipal Official Interviews

5.3.1 Section A: Severity Interview

The following responses were collected from a sample of four (4) municipal official participants. The data collection criterion was to establish the municipality officials' awareness of the modus operandi regarding the availability of stakeholders within the municipality and the extent to which many stakeholders are represented and allowed to participate in the municipality's Water Conservation Water Demand Management strategy and to better understand how the municipality functions.

Statement 1: all stakeholders are included in the current water demand management strategy.

Table 8: All Stakeholders are Included in the Current Water Demand Management Strategy

INTERVIEWEE	LEVEL OF AGREEMENT				
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1 (RLM)				X	
2 (RLM)					X
3 (RLM)	X				

4 (RLM)	X				
Total	2	0	0	1	1

The responses outlined in the Table 8 revealed that two out of four (2/4) participants agreed with the statement that all stakeholders are included in the municipality's current Water Conservation Water Demand Management. In comparison, the other (2/4) participants strongly disagreed with the statement. This finding suggests that there is a lack of inclusivity in the municipality's Water Conservation Water Demand Management strategy, as half of the participants disagreed with the statement that all stakeholders are included.

The data indicates that while some officials are aware of and value stakeholder participation in the municipality's WCWDM strategy, there is a proportion (half) that disagrees with the inclusivity of current practices.

Statement 2: The current water demand-management strategy encourages stakeholder participation.

Table 9: The Current Water Demand Management Strategy Encourages Stakeholder Participation.

INTERVIEWEE	LEVEL OF AGREEMENT				
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1 (RLM)				X	
2 (RLM)					X
3 (RLM)	X				
4 (RLM)		X			

Total	1	1	0	1	1

The involvement of stakeholders in the WCWDM strategy is essential for its success. Active and encouraged participation from stakeholders during development and implementation brings diverse perspectives and community support. Table 9 indicates that one (1) participant strongly disagrees and another one disagrees with the municipality's strategy in this regard. In contrast, one (1) participant strongly agrees while the other one (1) participant agrees that the municipality's WCWDM strategy effectively encourages stakeholder participation as they are represented by it.

Statement 3: All stakeholders are involved in the water demand management process/decision-making.

Table 10: All Stakeholders are Involved in the Water Demand Management Processes / Decision-Making.

INTERVIEWEE	LEVEL OF AGREEMENT				
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1 (RLM)				X	
2 (RLM)		X			
3 (RLM)	X				
4 (RLM)	X				
Total	2	1	0	1	0

This study aims to gain insight into the extent of stakeholder involvement in decision-making processes. For an effective Water Conservation Water Demand Management strategy, it is crucial to encourage stakeholder participation. By including diverse groups and considering their interests, concerns, and expertise, stakeholder involvement ensures the successful

implementation of the strategy while fostering a sense of ownership and collaboration. A well-coordinated and inclusive WCWDM strategy facilitates the decision-making process for municipalities.

Participants were surveyed about their perceptions of stakeholder inclusion in the water demand management process/decision-making. Table 10 illustrates that two out of four (2/4) participants strongly disagree, and one participant disagrees with stakeholders being involved in municipal WCWDM strategies due to a perceived lack of inclusivity. Contrarily, only a quarter of the participants agree that stakeholders are an integral part of the decision-making process employed by the municipality.

Statement 4: Stakeholder involvement affects the municipality's overall water demand management strategy.

Table 11: Stakeholder Involvement Affects the Municipality's Overall Water Demand Management Strategy.

INTERVIEWEE	LEVEL OF AGREEMENT				
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1 (RLM)					X
2 (RLM)					X
3 (RLM)				X	
4 (RLM)				X	
Total	0	0	0	2	2

The involvement of stakeholders is a pivotal element in the success of a municipality's water conservation and demand management strategy. It promotes a comprehensive, well-informed, and efficient approach, bolsters community backing, and guarantees the sustainability and

enduring influence of the strategy. This study aims to evaluate the degree of stakeholder participation and its influence on the development and execution of the WCWDM strategy. Table 11 illustrates that two out of four (2/4) of the municipal officials strongly agree while the other two (2) agree that stakeholder involvement affects the municipality's overall water demand management strategy.

Statement 5: There is a sufficient stakeholder balance in the municipality's water demand management strategy.

Table 12: There is a Sufficient Stakeholder Balance in the Municipality's Water Demand Management Strategy.

INTERVIEWEE	LEVEL OF AGREEMENT				
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1 (RLM)				X	
2 (RLM)					X
3 (RLM)		X			
4 (RLM)		X			
Total	0	2	0	1	1

Determining if a municipality's water demand management strategy has a satisfactory stakeholder balance is a complex process that relies on various considerations. The literature chapter of the stakeholder discussion outlined a comprehensive evaluation approach. The study aims to evaluate the stakeholder balance across the municipality, encompassing all individuals within the jurisdiction impacted by the WCWDM strategy. One out of the four participants (1/4) strongly agree, while another participant agrees that the stakeholder balance within the municipality is sufficient. They point to the current bulk agreements with water boards and the informal setting which does not provide decision-making powers to all stakeholders affected

by the municipality's strategy. However, half of the participants, (2/4) disagree and argue that there is not enough stakeholder balance in the municipality. They support their conclusion with the current perception collaboration and inclusivity agreements.

5.3.2 Section B: Comprehensive Interview (Municipal)

The focus of this study is to assess the degree of stakeholder participation in water conservation and demand management strategies within the Rustenburg jurisdiction. The following in depth questions were asked of municipal officials.

1. **Which stakeholders do you think should be included in the current water demand management strategy?**

"Besides local government authorities, who play a major role already in the current water demand management strategy, other stakeholders who should be involved include community representatives … We know that agriculture is a major water use, particularly in South Africa. Hence, I believe that engaging the farmers will be important and beneficial for the municipality for sustainable water management … businesses and industries are important consumers of water. Engaging them could lead to better water use practices and efficiency improvement in terms of managing the water demand, especially in some periods when the demand is high … ward councillors who are important leaders who would play a significant role in the water demand management strategy." **MO1**

2. **To what extent does the demand management strategy encourage stakeholder participation?**

Within the water demand management strategy in Rustenburg, stakeholders include the Rustenburg Water Services Trust, a municipal entity responsible for supplying water services in the area. This is achieved through the appointed service provider WSSA, as well as Magalies Water and Rand Water boards. One challenge is limited communication between

the municipality and other water boards. While there are existing bulk contracts, stakeholders do not engage beyond their contractual obligations. **- MO1**

It is crucial for stakeholders to collaborate in addressing future water demands and improving water quality issues in Rustenburg. Clear communication of their roles and responsibilities within the water demand management strategies is essential. Emphasising existing contracts will help ensure progress on the implemented strategies. **– MO1**

Given the mining nature of Rustenburg, mines can significantly impact water demand management. However, it is important to note that RLM does not directly supply water to the mining sector and lacks regulatory authority over their management strategies. There is also limited interaction between the municipality and the community. To address these issues, establishing effective communication channels with residents would be beneficial in promoting informed participation in demand management efforts. Providing training workshops and educational resources would empower residents to promote sustainable water use during high-demand periods like summers in Rustenburg. **– MO1**

3. How are stakeholders involved in the water demand management strategy and what is their role in the water demand management process or decision-making?

To determine the extent of stakeholder involvement within the water demand management process, RLM Municipal Officials were asked to evaluate stakeholder engagement within the water demand management decision making process. Key responses are summarised as follows:

Stakeholders play a crucial role in the water demand management strategy throughout different phases of planning, implementation, and evaluation. They can contribute to monitoring and evaluating efforts by collecting data on water consumption in Rustenburg's jurisdiction, assessing the effectiveness of the water demand management program, and

***soliciting feedback on implemented measures. Stakeholder involvement is also important during the implementation stage through activities such as educational campaigns in schools or conducting water audits and leak detection programs. By including stakeholders in decision-making processes, they can actively contribute to developing effective strategies for managing water demand while fostering a sense of ownership.* – MO1**

***Active stakeholder involvement is crucial in water management interventions as it enables the collection of valuable information on local water use patterns, cultural practices, and community dynamics. Stakeholders serve as advocates for the strategy within their communities by raising awareness about the importance of water demand management and encouraging public participation. Their inclusion ensures that decisions are well-informed and aligned with the needs and values of the community, thereby enhancing the relevance and sustainability of strategies.* – MO2**

4. Does stakeholder involvement affect the municipality's overall water demand management strategy? Elaborate.

The central premise of this study is that stakeholder involvement significantly impacts a municipality's water demand management strategy.

***Incorporating stakeholder involvement in the* municipality's *water demand management strategy has a significant impact. It ensures that the strategy is tailored to address the specific needs and priorities of the community, considering different challenges faced by various stakeholder groups. This promotes transparency in decision-making, fosters trust within the community, and holds the municipality accountable for its actions. Active engagement of stakeholders also encourages advocacy and support for water-saving initiatives, leading to increased participation.* – MO1**

***By engaging stakeholders, the municipality can develop a strategy that aligns with the long-term interests of the community. This increases the potential for sustained implementation and adaptation to changing conditions. Involving communities also leads to reduced vandalism as they take ownership of infrastructure maintenance, ensuring safety and care for reservoirs in the area.* – MO2**

The findings present well-argued points on various positive effects of stakeholder involvement such as alignment of strategies with community needs, transparency in decision-making, gaining community support, and ensuring long-term sustainability of the strategy. The municipal officials agree with the statement that stakeholder involvement affects the municipality's overall water demand management strategy.

Active participation of stakeholders enhances their advocacy and support for strategies, leading to increased involvement in water-saving initiatives. Involving stakeholders enables municipalities to create a sustainable strategy that aligns with long-term community interests and can adapt as necessary. This inclusion also mitigates vandalism through heightened community ownership and care for infrastructure such as reservoirs thereby ensuring safety within the area.

5. How can the stakeholder balance in the municipality's water demand management strategy be improved?

The study explores the critical aspect of stakeholder balance within a municipality's water demand management strategy, specifically focusing on RLM's strategy.

Improving stakeholder balance in the municipality, particularly regarding water demand management strategy, involves effectively engaging a diverse range of stakeholders and considering their interests. Open and transparent communication with stakeholders is key

***to ensuring transparency. Providing training and capacity-building opportunities can empower stakeholders to actively participate in water demand management efforts.* – MO1**

***Effective stakeholder engagement is crucial in developing strategies for water management. By involving stakeholders, their ideas and concerns can be integrated into decision-making processes, contributing to a balanced approach. Recognising and acknowledging the contributions of stakeholders is also important, which can be done through public acknowledgment or providing incentives that promote continued participation.* – MO1**

The analysis recognises the importance of engaging a diverse range of stakeholders, considering their interests, and integrating their input into the strategy. The findings also emphasise the role of open and transparent communication, suggesting this is a way to foster trust and cooperation among stakeholders.

Municipal officials also suggest hands-on stakeholder engagement through capacity-building methods to ensure continued and meaningful involvement. It's a vital point as it can enhance the stakeholders' ability to participate effectively. The findings acknowledge the positive impact of publicly recognising the contributions of stakeholders, fostering a sense of pride and motivation.

It was found that stakeholders' roles and responsibilities should be clearly defined and outlined. This ensures clarity and accountability within the stakeholder engagement process. Disputes and conflicts are to be expected during these engagements and as such, it might be imperative to delve into how potential conflicts or disputes among stakeholder groups can be managed.

5.4 Chapter conclusion

The research findings chapter illustrates the level of stakeholder engagement and balance in executing the Water Conservation Water Demand Management strategies of the Rustenburg Local Municipality. The data shows that the stakeholder engagement is not adequate and there

is room for improvement. There are concerns of transparency and inclusion of all stakeholders within the demand management strategies. Inclusion of community representatives, industries in Rustenburg, water specialists and waterboards should be institutionalised.

CHAPTER 6: RESEARCH DISCUSSIONS

6.1 Introduction

The purpose of this study was to examine the effectiveness of stakeholder engagement in the Water Conservation Water Demand Management strategy of the Rustenburg Local Municipality. To achieve an improved stakeholder balance, key stakeholders need to be identified, their interests and concerns need to be clearly outlined, and strategies for effective stakeholder engagement need to be outlined and implemented.

In this chapter, the research findings from Chapter 5 are analysed in relation to the main objectives of this study. The analysis considers the literature review discussed in Chapter 2 for a better understanding of the research context. Furthermore, existing studies are compared with our results and any limitations encountered during the study are acknowledged and addressed.

6.2 Stakeholder Involvement

The research objective investigated the extent of stakeholder involvement within the Water Demand Strategy of the Rustenburg Local Municipality. With four out of six participants of the stakeholders strongly agreeing that all relevant stakeholders are included, it suggests the current level of stakeholder involvement is high. However, the presence of disagreement from one participant cannot be dismissed and needs further probing to understand the reasons perception.

Two (2) participants either did not support or were undecided about the inclusiveness of the Water Demand Management strategy. This suggests a need for improved communication, transparency, and potentially a review of the stakeholder engagement process, to ensure that all necessary stakeholders are appropriately involved.

Rustenburg Local Municipalities stakeholder engagement strategy seems to be partially successful. However, neutrality and disagreement indicate room for improvement, reflecting a need to address marginalised concerns and strengthen the effectiveness of Water Demand Management strategies.

During the severity interview, it was evident that while some municipal officials are aware of and value stakeholder participation in the municipality's Water Conservation Water Demand Management (WCWDM) strategy, there is a significant proportion that disagrees with the inclusivity of current practices.

Half of the participants (agree categories) indicate recognition and acceptance of stakeholder involvement in the WCWDM strategy. This suggests a degree of dialogue and relationship that can support the strategy's success.

The fact that half of the participants strongly disagreed with the statement reveals a significant gap in perspectives. This could be due to a lack of transparent communication or decision-making processes that exclude certain stakeholders.

For a more comprehensive understanding, the study also examines the reasons why these officials disagreed or agreed with the statement. This could shed light on any systemic or process-oriented problems within the municipality that hinder stakeholder involvement.

Overall, the findings suggest a need to enhance stakeholder engagement and inclusivity in the municipality's WCWDM strategy. Concerted efforts should be made to understand the causes of the perceived lack of inclusivity, and tailor solutions to address these specific concerns.

During the comprehensive interviews a comprehensive analysis of stakeholder engagement and municipal strategies for water demand management was conducted. It offers a thorough comprehension of the dynamics and complexities involved in implementing such a system within a socio-legal framework.

The stakeholder analysis highlights varying levels of involvement. Water Board Stakeholders, who contribute to the technical aspects of the strategy, demonstrate a high degree of participation, indicating effective collaboration with the local government. This observation aligns with Functional Theory of Stakeholder Salience which suggests that stakeholder influence is influenced by power, legitimacy, and urgency.

On the other hand, mining entities and some other stakeholders perceive limited participation in discussions with the municipality despite their significant role in water consumption. This disparity signals potential issues regarding stakeholder inclusivity and points towards opportunities for enhancing stakeholder governance.

Through an evaluation of the municipality's implementation approach, it becomes apparent that there is a strong emphasis on water conservation in alignment with global sustainable development goals. The integration of a comprehensive water demand management strategy into the municipality's Integrated Development Plan demonstrates a strategic and committed approach to meeting these objectives.

The analysis reveals an efficient relationship between the municipality and certain stakeholders, while also highlighting potential areas for improvement in terms of inclusivity with other key factors such as industries and communities. Furthermore, it underscores the municipality's robust efforts towards conserving water demand.

Further exploration could focus on enhancing stakeholder relations and examining how these dynamics impact the overall success of water demand management initiatives. This will help identify additional measures that can be taken to ensure effective collaboration among all relevant parties involved.

From this analysis, there is an evident dichotomy in participants' viewpoints on stakeholder involvement in the WCWDM strategy. The positive side displays an awareness of the

importance of collaborative efforts, and that the municipal strategy incorporates different perspectives, addressing the needs of diverse groups. This can foster a sense of collective ownership, generate more robust strategies due to various perspectives, and likely increase strategy success.

However, negative sentiments (3/4 participants disagreeing in various degrees) towards stakeholder inclusivity highlight potential gaps or deficiencies in the process. The perceived lack of inclusivity may be due to a variety of factors, such as communication barriers, decision-making power imbalance, or inadequate representation of stakeholder interests. This division could lead to tensions and dissent, which may hamper the strategy's successful implementation.

The findings indicate a diverse range of stakeholder involvement in the municipality's Water Conservation Water Demand Management strategy. These findings can be analysed using several theoretical perspectives.

1. Communication Theory (West, 2010): Stakeholders highlighted effective communication as a driving factor in successful WCWDM strategies. This aligns with the theory arguing that communication acts as a bridge between strategy planning and execution.

2. Stakeholder Theory: The need for more inclusive stakeholder participation reflects the normative aspect of this theory which asserts that all stakeholders have intrinsic value, and their interests should be considered independently of their power or influence (Freeman et al, 2010).

3. Resource Dependence Theory: Through the mining sector's efforts to reduce their water usage, they are demonstrating how organisations try to modify their dependence on critical resources (Biermann and Harsch, 2017). This aligns with the principles of this theory.

4. Network Governance Theory (Davis, 2012): Stakeholders express dissatisfaction with the current level of stakeholder participation and engagement, underlining the need for enhanced

network governance. This situation resonates with the theory's emphasis on the requirement for active cooperation, interaction, and coordination among network members.

5. Sustainability Theory (Harrington, 2016): The implementation of advanced water treatment technologies and water-saving initiatives are practical applications of this theory, emphasising long-term resource stewarding for the optimal balance between socio-economic development and the preservation of environmental resources.

The findings ultimately shed light on the multi-layered nature of stakeholder engagement in the WCWDM strategy, emphasising the need for effective communication, more inclusive and engaged stakeholder participation, strategic resource management, and the pursuit of sustainable solutions.

Based on the findings, we can discern that stakeholder involvement plays a crucial role in a municipality’s water conservation and demand management strategy.

From one viewpoint, it is notable that half (2/4) of municipal officials strongly agree on the beneficial impact of stakeholder engagement. Their strong agreement recognises the importance of inclusive decision-making processes, suggesting that stakeholder involvement fosters collective ownership and facilitates the successful implementation of the WCWDM strategy by pooling diverse ideas and perspectives.

On the other hand, the remaining half (2/4) agree with the statement implying a level of uncertainty or potential dissatisfaction regarding stakeholder participation. This apprehension could be attributed to perceived shortcomings in the present participatory process, ranging from communication issues, unequal power dynamics, or a lack of effective methods to capture a range of stakeholder input.

The research reveals that stakeholders play a crucial role in the water demand management strategy and decision-making processes. This section focuses on stakeholder engagement in

the water demand management strategy, emphasising the roles that stakeholders play at different stages. According to municipal officials, stakeholders contribute in the following ways:

1. Monitoring water use and program effectiveness and providing feedback on different measures.
2. Participation in the actual application of policies, such as educational campaigns and leak detection programs. This encourages a sense of ownership among stakeholders.
3. Providing valuable information about local water use, cultural practices, and community dynamics. Their role as advocates also raises awareness and boosts public support.

The results conclude that stakeholder engagement enhances the relevance, effectiveness, and sustainability of the strategies because decisions made are well-informed and align with the community's needs and values. However, there could be an exploration of challenges faced by stakeholders, like resource limitations, and communication gaps among stakeholders, and how these challenges could be overcome.

Stakeholder involvement significantly affects the municipality's overall water demand management strategy in several ways. Stakeholder engagement guarantees that the strategy aligns with the specific needs, concerns, and priorities of the community. Through an understanding of challenges faced by various stakeholders, customised solutions can be developed to effectively address these issues. Furthermore, stakeholder involvement fosters transparency in decision-making processes which helps establish trust within the community and holds authorities accountable for managing water demand.

Active participation of stakeholders enhances their advocacy and support for strategies, leading to increased involvement in water-saving initiatives. Involving stakeholders enables

municipalities to create a sustainable strategy that aligns with long-term community interests and can adapt as necessary. This inclusion also mitigates vandalism through heightened community ownership and care for infrastructure such as reservoirs thereby ensuring safety within the area.

Stakeholders in any community will have varying interests and resources. Including a more in-depth discussion on managing this diversity in stakeholder interests could improve the strategy. Any strategy can face resistance or obstacles. Acknowledging these potential challenges will provide a more balanced and realistic analysis. The findings elaborate on the benefits and roles of stakeholder involvement, but an important aspect not covered is how the success of this involvement could be quantified.

The analysis of these findings draws on several academic theories:

1. Collaboration Theory (Colbry et al., 2014): The analysis indicates that successful water management requires a collaborative approach. This is supported by collaboration theories that advocate for stakeholder engagement to ensure effective problem solving.
2. The Principle of Inclusive Governance (Armstrong, 2006): The emphasis on stakeholder involvement reflects this principle which underscores the engagement of stakeholders in decision-making processes for better outcomes.
3. Resource Management Theory (Guo, 2005): The focus on infrastructure maintenance ties into this theory which argues for the efficient use and conservation of resources to ensure future availability.
4. The Theory of Collective Action (Useem, 1998): This suggests that when stakeholders are actively engaged, they are more likely to advocate for and support strategies within their communities, thereby improving the likelihood of successful implementation.

5. Transparency and Accountability Theory (Filgueiras, 2016): Transparency in decision-making helps build trust and enhances accountability. Therefore, by promoting transparency, local municipalities can gain community support and trust.
6. Sustainability Theory (Harrington, 2016): By making sure the management strategy reflects the long-term interests, it aligns with this theory that emphasises the need for sustainability in all strategies.

6.3 Stakeholder Participation

The finding indicates scope for improvement in terms of including more stakeholders in these strategic efforts. Increased participation could offer a wider range of perspectives and improve the effectiveness and acceptance of these strategies.

While most of the participants recognise their key role in water demand management, there's a fraction that either isn't involved or lacks important information about the strategies. Addressing these issues could help improve strategy implementation and stakeholder involvement. More comprehensive studies would be needed to identify specific ways to address these issues.

Therefore, it is crucial to address this issue by improving information dissemination and increasing awareness among stakeholders.

The findings demonstrate a clear split in the perceptions of municipal employees regarding the degree of stakeholder participation in the WCWDM strategy. There seems to be an equal divide among participants, with two out of four (2/4) participants holding positive views and the remaining half expressing negative views.

On the positive side, two (2) out of four (4) participants acknowledge and appreciate the municipality’s efforts in engaging stakeholders. This acceptance indicates a sense of approval and an optimistic disposition towards the strategic plan.

However, two (2) out of the four (4) municipal participants believe the contrary. These officials are critical of the municipality's strategy, believing that it does not adequately encourage stakeholder participation. This suggests dissatisfaction and perhaps a need for a more effective and inclusive approach.

This section reveals an inconsistency in the perception and effectiveness of stakeholder engagement in the WCWDM strategy. Section B of the Municipal Officials Interview further investigates the reasons for disagreement to improve the involvement process. This could encompass more transparent decision-making procedures or enhanced communication mechanisms. By doing so, it might bridge the gap in perspectives, enhancing effectiveness, ownership, and acceptance of the WCWDM strategy.

The stakeholders need a workshop to make them aware of the Water Conservation Water Demand Management strategy of the municipality enshrined in the Water Services Act that any municipality that is given the right of authority must implement a WCWDM strategy that is inclusive of all.

The municipality has failed to adhere to its Constitutional mandate to the extent that stakeholders (citizens) have normalised an abnormal situation.

Several participants underscore a role dominated by communication and facilitation efforts to keep municipalities informed. These responsibilities primarily focus on the fostering of an environment that enables information sharing and effective coordination.

An interesting strategic role surfaces in the economic domain, where stakeholder participation contributes indirectly to water conservation through economic enhancement and project identification. This role, often occupying a higher echelon, carries strategic implications and ties in with broader socio-economic development goals. The text also reveals a more responsive

role in water demand management, characterised by adaptability in consumption practices in response to water supply changes.

A supervisory role also emerges, with stakeholders ensuring quality and transparency. The purpose of this role seems to be to reinforce accountability and clear communication, crucial factors in managing water demand effectively within a municipality.

The exploration of these varied roles offers valuable insights into the complexities of managing a communal resource, shedding light on the importance of the communication, strategic, responsive, and supervisory roles in effective water demand management. It invites further research into conflict resolution, stakeholder engagement, and resource management.

The findings present multifaceted challenges revolving around stakeholder engagement in Rustenburg's current water demand management strategy. Here are the key themes, contextualised within academic theories:

1. Stakeholder Theory (Freeman et al, 2010): The focus on various stakeholders (like the Rustenburg Water Services Trust, Magalies Water, Rand Water, and the mining sector) conforms to the Stakeholder Theory. Here, every interested party's role becomes essential for the effective implementation of the water demand management strategy.
2. Communication (Bradford, 2016): The findings highlight communication gaps among the stakeholders. This mirrors principles from Organizational Communication Theory (West et al, 2010): that the flow of information isn't optimum, which could lead to inefficiencies in strategy implementation.
3. Future Planning: Preparing for future water demands and improvements in the water quality, as per the findings, relate to Strategic Management theories emphasising the importance of foresight and planning for sustainability.

4. Community Engagement and Education (Mahajan et al., 2023): The need for community participation and the provision of educational resources signifies the importance of Public Participation Theory. Strengthening ties through these means can improve local understanding and support for the water demand management strategy.
5. Power Dynamics (Bradford, 2016): Limited regulatory influence over the mining sector and disparities in engagement reflect Power Imbalance Theory, hinting at the need for balanced power dispersion among stakeholders.

The findings emphasise the need for improved stakeholder communication, foresight in planning, enhanced community engagement, and addressing power imbalances, all of which conform to diverse academic theories.

6.4 Stakeholder Engagement and Collaboration

The prevalent assumption is that there is no legal contract/agreement in place that governs water-demand interactions with the municipality. It should be acknowledged that most participants, particularly officials from the waterboards, may have been influenced by their belief that bulk agreements serve as legal guidance in their interactions with the municipality. Three (3) of the participants were identified as waterboard officials. Conversely, all other stakeholders held a different view on this matter. This indicates a lack of contractual arrangements to manage relationships with other stakeholders.

Additionally, one (1) of the participants disagreed with this statement. The absence of stakeholder models and platforms for engagement with various parties involved, including councillors, mines, and industries that are significant water consumers in Rustenburg Local Municipality underscores the need for an effective stakeholder strategy implementation plan. These challenges can also be attributed to a lack of clear directives from the municipality

regarding establishing stakeholder forums and addressing the impact of population growth on municipal water operations.

The findings reveal a complex ecology of formal agreements aimed at dictating the interaction between stakeholders and the municipality regarding water management. The findings fixate on the Rustenburg Local Municipality case study, revealing the multiple layers of relations and compliance structures embedded within it.

Evidently, the power dynamics between various stakeholders are evident in the contract execution. Some stakeholders feel excluded, and there are concerns about transparency, reinforcing the theory of stakeholder power imbalance. The analysis reveals that municipality employs several strategies for demand management, such as meeting quotas and providing alternative services when necessary. Stakeholder feedback emphasises the vital role of these morale-boosting, robust mechanisms which are key to maintaining supply-demand balance.

Nonetheless, there is a notable absence of an official agreement regulating the interaction between the mining operations and the municipality, indicating a gap in policy coverage. This implies that future research could focus on examining the implications of such gaps on water management and stakeholder satisfaction.

The monthly meetings highlighted demonstrate a commitment by the municipality to continuous performance assessment and improvement, backed by direct stakeholder end–agreement - a critical element in successful urban governance. Overall, the analysis chronicles an intricate web of formal relationships within water management, signifying an ongoing effort towards inclusive water governance but highlighting areas that call for enhanced transparency and inclusivity.

6.5 Stakeholder Balance and Transparency within the Municipal Water Demand Strategy

While one-third of the participants believed that stakeholder balance was adequately maintained, an equal proportion of participants extended suggestions for improvement, implying they felt changes were necessary. This therefore suggests polarisation in perceptions about stakeholder participation. It is interesting to note that the positive and negative perceptions were not evenly distributed. While one-third of the participants strongly agreed that stakeholder balance was met, only one out of six (1/6) participants entirely disagreed. Meanwhile, another one out of six (1/6) participants partially agreed with the condition of the current stakeholder balance.

The theme of inclusivity emerges quite prominently. Stakeholders underline the need for ample representation from all sectors in the decision-making process regarding Water Demand Management. This reflection is consistent with theories of participatory governance, proposing that inclusive decision-making processes lead to more universally acceptable outcomes.

Transparency is another important theme highlighted by the stakeholders. They emphasise that information about strategic documents and decisions should be widely shared to engender a sense of communal ownership over the water conservation strategy – a proposition rooted in principles of open government and public participation.

Resource allocation, particularly in terms of infrastructure and strategic planning, is another recurrent theme. Stakeholders highlight the importance of planning for future demands and upgrading current infrastructure. This reflects the broader academic discourse around sustainable resource management and development planning.

Lastly, power dynamics raise questions about the distribution of power among stakeholders. Some observations indicate a perceived imbalance in influence – mainly weighted towards water boards. This observation correlates with theories of power imbalance within stakeholder

relationships, suggesting that stakeholders with more power resources may exert more influence on decision-making.

The analysis scrutinises the municipality's water demand management strategy through a stakeholder balance lens. The ontology identifies the importance of encompassing all individuals within the jurisdiction and how their perceptions reflect on the strategy's efficacy.

One participant strongly agreed and the other one agreed, suggesting a satisfaction with the current approach that includes bulk agreements with water boards. They hint at the importance of informal settings in decision-making processes, although these don't delegate powers to all stakeholders affected. In contrast, two out of four (2/4) of participants disagreed with the balance, hinting to concerns over the current lack of collaboration and inclusivity agreements. They suggest the municipality's strategy does not yet incorporate all essential stakeholders, leading to dissatisfaction and potential ineffectiveness of the water management strategy.

Municipal officials also suggest hands-on stakeholder engagement through capacity-building methods to ensure continued and meaningful involvement. It's a vital point as it can enhance the stakeholder's ability to participate effectively. The findings acknowledge the positive impact of publicly recognising the contributions of stakeholders, fostering a sense of pride and motivation.

It was found that stakeholders' roles and responsibilities should be clearly defined and outlined. This ensures clarity and accountability within the stakeholder engagement process. Disputes and conflict are to be expected during these engagements and as such, it might be imperative to delve into how potential conflicts or disputes among stakeholder groups can be managed.

The findings align with several academic theories and concepts:

1. Stakeholder Theory (Freeman et al, 2010): This theory posits that organisations are accountable to all parties affecting and affected by their operations. The document's

emphasis on a “diverse range of stakeholders” aligns with this, stressing the need for inclusive engagement.

2. Integrated Communication Theory (West et al., 2010): The need for open and transparent communication and incorporating stakeholder input resonates with this theory. Good two-way communication limits misunderstandings and encourages cooperation.
3. Capacity Building Theory (Stewart, 2015): The idea of providing training and encouraging stakeholder participation relates to this theory. This enhances stakeholders' ability to engage meaningfully, contributing constructively to the water demand management strategy.
4. Recognition Theory (Honneth, 2014): The suggestion for awards and incentives aligns with this theory, which postulates that acknowledging and rewarding contributions motivates more involvement and fosters a sense of ownership amongst stakeholders.

The findings demonstrate the complexity of involving varied stakeholders in demand management strategy. The need for open communication, stakeholder capacity, and recognition of contributions implies that a robust strategy should consider the values, knowledge, and abilities of all stakeholders, giving them an active role in managing water demand.

6.6 Conclusion

This section has highlighted the complexity of stakeholder balance in executing effective water management strategies. The importance of clear and transparent communication, inclusion of all stakeholder voices, capacity building, and recognition of contributions are the key takeaways. It is crucial that a comprehensive strategy where stakeholder participation goes beyond mere contractual obligations be developed and implemented. Such a strategy should cultivate a shared sense of responsibility and engagement towards sustainable water use an

approach reinforced by rewarding stakeholder engagement. Optimally, this strategy is data-based, incorporating diverse stakeholder perspectives and operational realities. Through the lens of theoretical analyses, these findings underscore the necessity to integrate recognised theories like stakeholder, communication, and recognition theories into practical strategies to achieve a more effective, sustainable water demand management system. The next chapter deals with the discussion from the findings and literature review chapters.

CHAPTER 7: CONCLUSION AND RECOMMENDATIONS

7.1 Introduction

The primary objective of this research was to investigate role of stakeholder's expectations within the Water Conservation Water Demand Management strategy of a mining municipality, namely the Rustenburg Local Municipality.

The review of scholarly literature has underscored the significance of involving stakeholders and identifying different stakeholders within the municipality. The section on research methodology has outlined the approach and methods used to gather data from stakeholders in Rustenburg.

The results chapter presents the study's findings, including stakeholder perceptions of water demand management issues and their roles within the municipality. The discussion chapter analyses these results, emphasising the importance of stakeholder involvement in decision-making and compliance. It also provides recommendations for improving stakeholder engagement in water management to enhance legitimacy and compliance of decisions made by the municipality.

This chapter concludes the research by demonstrating findings from each research method. Clear and feasible recommendations keeping with the initial objectives and research question are made from the findings. Finally, areas for future research topic or methodologies are derived from research thus removing some limitations of the research.

7.2 Conclusions from the Study

This section illustrates the overall conclusion of the study as whole:

7.2.1 Findings from the Literature Review

In conclusion, the literature review has examined the significance of involving stakeholders in water conservation and demand management plans within a municipality. The review has emphasised the various paradigms of stakeholders present in municipal settings, emphasising their participation in decision-making and adherence to regulations. Effective strategies for enhancing stakeholder engagement in water management have been discussed alongside challenges that must be addressed. Additionally, the policy and legal framework governing potable water services at a local government level in South Africa were explored as they provide a basis for making informed decisions on water management. This literature review offers valuable insights into understanding stakeholder expectations within the context of implementing a water demand management strategy specific to Rustenburg Local Municipality or similar mining municipalities.

7.2.2 Findings from the Primary Research

The findings and discussions of this thesis have shed light on the importance of stakeholder expectations in water demand management strategies within Rustenburg Local Municipality.

The study emphasises the significance of involving stakeholders in water demand management strategies in Rustenburg Local Municipality. The findings contribute to existing literature on stakeholder engagement and can inform policymaking and decision processes in Rustenburg and other municipalities facing similar challenges.

As per the research question, this study aims to answer the following question: How does stakeholder involvement at the Rustenburg local Municipality affect the municipalities Water Demand Management strategies? Given this research question, the following sub-questions were explored:

i) Who are the Rustenburg Local Municipality water demand stakeholders?

According to this research, the identified stakeholders within the Rustenburg Local Municipality Water Conservation Water Demand Management strategy includes Waterboards, Different spheres of Government, traditional councils, industries within the municipality and community representatives.

ii) How are stakeholders involved and what role do they play in water demand management process/decision making?

The research findings indicate that stakeholders play a vital role in the decision-making process and implementation of water demand management strategies. Their involvement is crucial for developing effective conservation programs, as they provide input on strategies, participate in decision-making processes, and implement conservation measures. The study highlights the importance of adopting a collaborative approach that involves all stakeholders to meet their diverse expectations. It also emphasizes the need for consensus-building among stakeholders to ensure successful and sustainable implementation of water demand management strategies. In conclusion, stakeholder involvement is essential in ensuring the responsiveness, effectiveness, and sustainability of water demand management strategies.

iii) How does ii) affect the overall water demand management strategy of the municipality?

The Rustenburg Local Municipality's water demand management strategy is greatly influenced by the different perspectives and requirements of stakeholders. When creating and implementing water conservation programs, it is crucial to consider the expectations of government agencies, mining companies, and residents within a mining municipality. This study highlights the importance of stakeholder involvement, collaboration, and consensus in shaping future strategies for water conservation and management. It emphasizes the need for a comprehensive and inclusive approach to developing effective water conservation programs.

By understanding how stakeholders interact with each other and impact the current management approach's effectiveness, the municipality can create a responsive and inclusive strategy for managing water conservation efforts.

iv) Is there sufficient stakeholder balance in the municipality's water demand management strategy?

Based on the results presented it is evident that there some level of balance in the municipalities water demand management strategy. However, some stakeholders felt excluded or were not involved in the planning stages of the water demand strategy. Issues of transparency amongst all stakeholders were also noted.

v) How can municipalities improve stakeholder management and participation in their Water Demand Management strategies?

To enhance stakeholder management and participation in Water Demand Management strategies, municipalities can implement several measures. First, establishing effective communication channels is crucial. This involves engaging stakeholders in the development and implementation stages through regular meetings, workshops, and public consultations. Additionally, leveraging technology platforms and social media can help raise awareness among a wider audience and encourage their involvement in these initiatives. Lastly, offering incentives to actively participating stakeholders will further motivate them to engage with the strategies effectively.

7.3 Recommendations

Based on the research conducted on the role of stakeholder expectations within the water demand management strategy in a mining municipality, Rustenburg Local Municipality, the following recommendations can be made:

1. Identify and prioritise the key stakeholders involved in water demand management in Rustenburg Local Municipality. These stakeholders include, but are not limited to, local resident representatives, mining industries, the agriculture sector, government agencies responsible for water management, environmental organisations, and community-based organisations.
2. Stakeholder engagement should be prioritised in the water demand management strategy, as it has been shown to enhance the legitimacy and compliance of water management decisions. Engaging stakeholders in the decision-making process will not only ensure that their perspectives and concerns are considered, but it will also increase their sense of ownership and responsibility in the implementation of the strategy.
3. The municipality should use effective strategies for enhancing stakeholder engagement in water management, such as involving stakeholders in decision-making and compliance. Some potential strategies for enhancing stakeholder engagement include conducting regular stakeholder meetings and workshops, establishing platforms for continuous communication and feedback, providing transparent and accessible information about water management plans and actions, and providing incentives for stakeholder participation and collaboration in water demand management efforts.
4. The municipality should consider the different stakeholders within the municipal setting and their roles within the municipality, as well as the importance and necessity of stakeholder engagement.
5. The municipality should establish stakeholder platforms and decision-making structures that ensure effective communication and engagement. These platforms should provide opportunities for stakeholders to actively participate in the decision-making process and collaborate with the municipality in implementing water demand management strategies.

6. The municipality should evaluate the success of stakeholder involvement in water conservation to determine the effectiveness of the strategies used and to identify areas for improvement.
7. The municipality should invest in stakeholder education in water demand management to ensure that stakeholders are informed and empowered to participate effectively.

By implementing these recommendations, the municipality can improve its Water Demand Management strategy and ensure that stakeholders are effectively engaged in the decision-making process.

7.4 Areas for Future Research

Based on the results of this investigation, future areas for research may encompass a comprehensive examination of the efficacy of stakeholder engagement tactics in different localities, the influence of technology on supporting such efforts, and how stakeholders' expectations affect the implementation of water demand management strategies. Furthermore, the significance of such studies could delve into integrating traditional knowledge and practices to bolster water conservation initiatives as well as assess climate change's impact on water demand management within mining regions.

7.5 Conclusion

In conclusion, this research has illuminated the vital role of stakeholder engagement in water demand management strategies within the Rustenburg Local Municipality. The literature review and primary research clearly showed the significance of involving key stakeholder groups in implementing management strategies, enhancing legitimacy and compliance of decisions. Recommendations have been made to improve stakeholder engagement practices, such as prioritising stakeholder involvement, providing effective communication platforms, and fostering continuous education on water demand management. These suggestions aim to

enhance the efficacy of water management strategies and encourage stakeholder participation. However, further research should be conducted to understand the effectiveness of these engagement strategies across different settings, how technology influences engagement efforts, and the impact of stakeholder expectations on policy implementation. This would likely provide a deeper understanding of how best to tailor stakeholder engagement practices for optimum water demand management

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ANNEXURES

Annexure A: Ethics Clearance

Annexure B: RLM Research Permission Request

Annexure C: RLM Research Approval Letter

Annexure D: Stakeholder Research Interview Questionnaire Sample

Annexure E: Stakeholder Research Interview Transcripts

Annexure F: Municipal Research Interview Questionnaire Sample

Annexure G: Municipal Research Interview Transcripts