




Water service delivery challenges in Modimolle-Mookgophong Local Municipality, Limpopo, South Africa

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Background: Water is not equally accessible, and climate change is altering patterns of weather and rainwater around the world, causing shortages that will both intensify water scarcity and threaten the quality of the current water supply.

Aim: The study analyses the effectiveness of Modimolle-Mookgophong Local Municipality (MMLM) in provisioning water services. This study took place in the Limpopo province of South Africa.

Methods: A mixed-method approach was adopted under a pragmatic paradigm. The researcher used both probability and non-probability sampling techniques, including random and purposive sampling, to select participants for interviews and questionnaires. This was done to understand the challenges of water service delivery among the MMLM community members.

Results: Research findings revealed that the MMLM operates at about 70% capacity as a Water Service Authority. The water system, mostly asbestos pipes, is heavily deteriorated, affecting around 80% of the network. Frequent winter pipe bursts particularly common in winter and illegal connections in informal settlements further strain water provision.

Conclusion: The study established that MMLM faces several service delivery challenges related to the delivery of water. Although the local government has the primary constitutional obligation to deliver basic services such as water provisioning, the national and provincial governments should play a significant role in supporting municipalities to fulfil these obligations.

Contribution: This study will benefit municipalities and officials in improving future water service delivery. It will also guide other local municipalities facing similar challenges, helping establish a more efficient and effective water service system.

Keywords: water; service delivery; water management; water service authority; challenges; local government; protests.

Introduction

Water is an indispensable human right, and access to it is critical for human development. However, water service provision continues to challenge most water utilities in developing countries, including South Africa (Jegede & Shikwambane 2021; Netshipale 2016:7). According to Thompson and Tapela (2019:43), access to water is framed as a human right to ensure access to clean water that could substantially reduce the global burden of disease and the privatisation of water. Nonetheless, water is not equally accessible, and climate change is altering patterns of weather and rainwater around the world, causing shortages that will both intensify water scarcity and threaten the quality of the current water supply. According to section 27(1)(b) of the *Constitution* (RSA 1996), the right of access to water entitles everyone to sufficient, safe, physically accessible and affordable water for personal and domestic uses.

Water supply services are typically managed by authorised institutions staffed by knowledgeable professionals with the necessary infrastructure (Mokgobu 2023:69). This structure ensures reliable access to water services for rural communities in need. The Modimolle-Mookgophong Local Municipality (MMLM), located in South Africa's Limpopo province, faces several challenges related to service delivery, including the safe provision of potable water to those under its jurisdiction. This is a common struggle among many post-apartheid municipalities in modern South Africa.

This study focuses on water service delivery challenges in areas under the jurisdiction of MMLM. One of the reasons for conducting this study was the constant interruption of water supply services in these areas. Against this background, the article discusses the various challenges encountered by the MMLM in its efforts to provide efficient and reliable water services to the communities within its jurisdiction.

Despite the presence of a dedicated authority to supply water, many areas, especially townships in MMLM, continue to face water shortages. The challenges could be related to funding, infrastructure, decision-making, leadership and other factors.

The history and background of water services management in South Africa

Before 1994, the government in South Africa implemented policies that favoured the white population while ignoring the needs of the poor. During the apartheid regime in South Africa, government policies were designed to benefit a privileged minority. The water policy was no different in this regard. According to Weaver et al. (2017), the management of the country's water resources was geared towards benefiting the wealthy, rather than improving the lives of those living in poverty. Wealthy municipalities and towns were provided with access to water sources and sewage systems along racial lines, favouring the white community (Adom, Simatele & Reid 2023; Nkabane & Nzimakwe 2018). South Africa has used its social capital to safeguard its water resources by developing large-scale water transport systems, such as the Orange-Fish Sunday River transfer in the 1950s and the Lesotho Highlands Water Project in 1986.

The legacy of apartheid created a challenging situation for the democratic government elected in 1994. At that time, approximately 12 million to 14 million people did not have access to a formal water supply, while 21m individuals, out of a total population of 41m, lacked formal sanitation (DWAF 1999). The majority of these individuals resided in former homeland areas, where 75% of the population was concentrated on just 13% of the land, which was largely water scarce.

The lack of access to water services in black communities compared to their white counterparts has been a historical issue (Van Eeden & Khaba 2016). Nkabane and Nzimakwe (2018) also noted that previous white local municipalities maintained separate income accounts for their governed black townships and did not provide adequate support for these areas. The impact of water scarcity is closely linked to the historical legacy of colonialism and apartheid, which systematically marginalised black communities and denied them equitable access to water resources (Kaziboni 2022:28). Most municipalities and townships have made efforts to provide a basic level of services to their residents (Nkabane & Nzimakwe 2018:55). The distribution of water was often facilitated through a standpipe, while those with in-yard or in-house connections were typically charged a flat monthly fee during the apartheid era.

As the country's political climate grew increasingly unstable, the black majority turned to a civil disobedience strategy, as Scheurman noted (2018). This involved a collective refusal to pay for public utilities like water and electricity, known as the 'culture of non-payment' (Van Schalkwyk 2012). To avoid further exacerbating political tensions, the government chose to overlook the lack of payment and continued to provide essential services (Tucker, Le Borgne & Lotti 2010). However, tensions arose between various civil and political groups over the role of black-controlled local councils in collecting revenue and providing services.

Legislative framework for water services management

South African water management is integrated into three levels of government: national, provincial and local. The *Constitution* mandates them to observe and apply the principles of cooperative governance and intergovernmental relations while developing and implementing policies and carrying out their functions (Madumo & Koma 2019:582; Simo 2014). The *South African Constitution of 1996* acknowledges that each sphere of government has its unique character but emphasises that these spheres are interdependent and interrelated in their role of water resource management. The cooperative government connection binds all spheres of government and emphasises the principle of participatory decision-making in water management (Khangala, Madumo & Tshiyoyo 2023).

The White Paper on water and sanitation

The White Paper on Water and Sanitation was issued in 1994, with an emphasis on ensuring that all South Africans have access to basic water supply (DWAF 2004). The South African water sector institutional landscape aims to provide rural areas with potable water and electricity by 2025 (Claassen, Funke & Nienaber 2013). Water supply in South Africa is characterised by both achievements and challenges, with significant concern in the rural areas of Limpopo province (Apraku, Morton & Gyampoh 2021).

The National Water Act 36 of 1998

The *National Water Act 36 of 1998* (NWA) fosters water use that is efficient, sustainable and beneficial. The NWA considers both fundamental human needs and the development of equitable access to water. The NWA regulates raw water extraction licences and Water Service Authority (WSAs)' responsibilities as water users. This section of the code also governs the disposal of wastewater into a water source.

Regulatory performance measurement systems

The necessary data were collected from the WSAs using the Regulatory Performance Measurement Systems (RPMS) approach to assess WSA performance against 11 regulatory

key performance indicators (KPIs) set out in the National Water Services Regulatory Standard (NWSRS) and to identify trends over time to promote professional standards in the sector. Figure 1 shows an illustration of the functions.

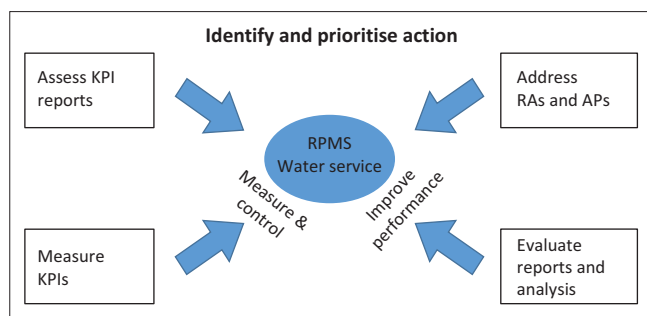
This method was used to analyse, assess and quantify the WSA's performance against the KPIs. The WSA output was examined using KPI reports generated by the RPMS. The method scores point in favour of regulation or non-enforcement by monitoring the progress of regulatory actions (RAs) and action plans (APs), and it addresses non-compliance. Finally, when corrective action has been taken to address noncompliance, performance is reviewed, assessing both the effectiveness of RA and the performance of WSA management.

Municipal infrastructure grant

Government grants empower municipalities as instruments for infrastructural development and service delivery in rural areas (Makgamatho 2017; Rangwato, Mukonza & Molepo

2022). Local Government (LG) has encountered massive backlogs in terms of service delivery provisioning, which hampers the acceleration of economic growth (Matabane 2017). Rangwato et al. (2022) alluded that the Municipal Infrastructure Grants (MIG) is an initiative allowance that is provided by the government to municipalities to improve service delivery by maintaining existing and dilapidated infrastructure.

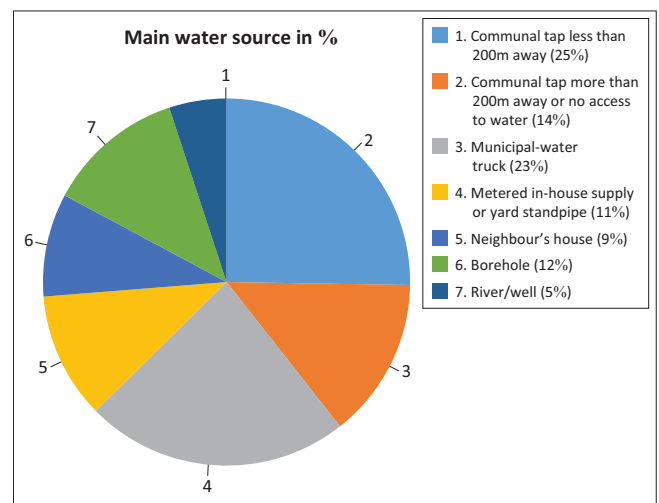
The implementation of MIG was premised on municipal service delivery backlogs and poor or inadequate collection of service levies and rent, which in turn hampers the ability of the MMLM to render services. The MIG also has its challenges such as failure of implementation, a lack of community involvement and late disbursement of funds, among others, and therefore backlogs remain when it comes to service provision (Carewood 2019:126).



Source: OECD, 2020, *Measuring regulatory performance: A practitioner's guide to perception surveys*, OECD Publishing, Paris

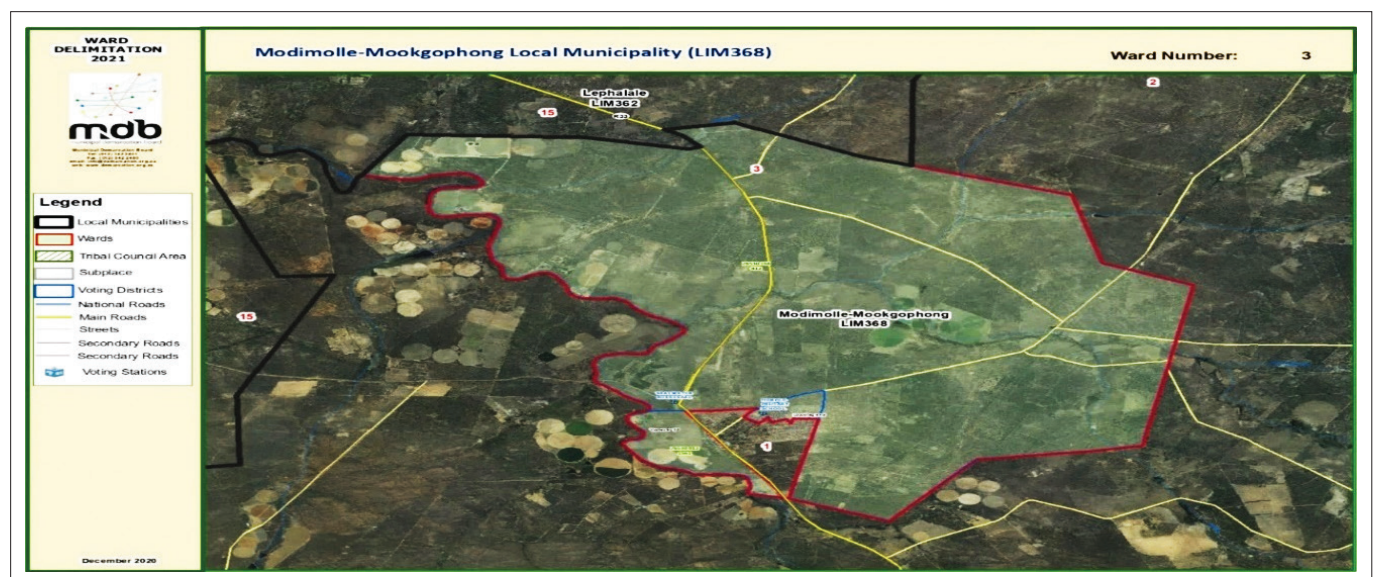
KPIs, key performance indicators; RAs, regulatory actions; APs, action plans; RPMS, Regulatory Performance Measurement Systems.

FIGURE 1: The regulatory performance measurement system process.



m, meter.

FIGURE 3: Main water source.



Source: Municipal Demarcation Board (MDB), 2022, *Municipal Boundary Demarcation process: A process map for the determination and re-determination of municipal boundaries*, HSRC, Pretoria

Note: Figure 2 is a map displaying the study's focus area.

FIGURE 2: Municipal demarcation.

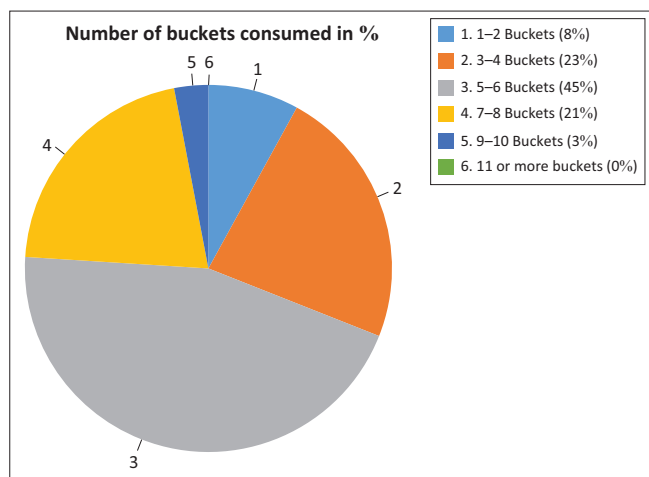


FIGURE 4: Number of buckets of water used per day per household.

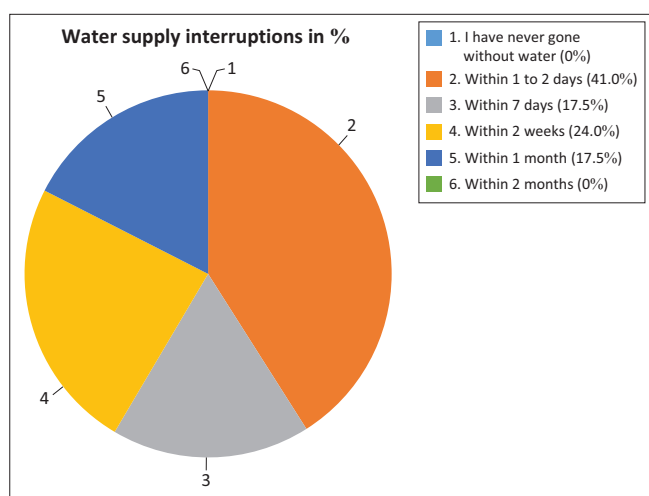


FIGURE 5: Water supply interruptions.

Service delivery protests

According to data from the South African Police Service (SAPS), there are an average of four to five violent anti-government protests in South Africa each day (Ives & Lewis 2020). To be clear, Water Service Delivery (WSD) issues became more prominent among the many justifications cited for protests. For this reason, poor service delivery is also blamed on the deployed officials to positions that they are not qualified for. Community protests are also a result of this, which makes it more difficult to provide essential services like water to the community (Municipal IQ 2019). South Africans have had a unique kind of social contract, which was established after independence in 1994 (Breakfast, Bradshaw & Nomorwayi 2019).

Social contract theory

The social contract theory is based on the premise that the government was going to deliver social and economic benefits to South Africa’s citizens. This would include free access to health care, education and effective service delivery by municipalities (Breakfast et al. 2019). The ineptitude of the government in providing basic

TABLE 1: Survey responses.

Sub-dimensions	Yes in %	No in %	Number of respondents
Do you know who provides water services in your municipality?	52	48	262
Do you know who your municipal ward councillor is?	73	27	262
Have you submitted water-related complaints to the municipality in the past 4 months?	62	38	262
In general, would you say that the MMLM has improved the access to and quality of water services since a year ago?	58	52	262

MMLM, Modimolle-Mookgophong Local Municipality.

TABLE 2: Themes derived from the study.

Theme	Findings analysis
To explore the challenges faced by the MMLM in providing effective water management services within its boundaries	<p>Theme 1:</p> <p>This research objective was achieved through a literature review to substantiate the research problem.</p> <p>MMLM has faced significant challenges because of resource shortages, resulting in inadequate service delivery. To effectively provide water services, the municipality must address these resource deficiencies.</p> <p>The inability of MMLM WSA to supply tap water to all households has led to illegal connections.</p> <p>According to the MMLM annual report (2020), outdated infrastructure has further hindered water service delivery. As one participant remarked, ‘Our reticulation network is 80% asbestos pipes, leading to frequent pipe bursts in winter and increased water losses.’</p>
To analyse the nature and extent of water services delivery by MMLM as Water Services Authority	<p>Theme 2:</p> <p>Findings reveal that the Water Services Authority is ineffective in delivering water services to the MMLM community for several reasons:</p> <p>The municipality has only operation and maintenance personnel, performing at about 30% of their potential.</p> <p>There is a lack of qualified staff at the Water Services Authority level. One participant stated, ‘To operate a water treatment facility, you need certified process controllers, which we do not have. Our operators are fulfilling these roles instead.’</p> <p>Effective management requires expertise in water care, sanitation or civil engineering, but the current Water Services Manager has only a chemistry background.</p> <p>Consequently, MMLM operates at just 70% capacity, falling 30% short of what a water services authority should achieve.</p>
To investigate adherence to the legislative and regulatory frameworks that govern potable water services delivery in South Africa	<p>Theme 3:</p> <p>The research objective was successfully addressed within South Africa’s water service regulatory framework.</p> <p>The MMLM adheres to the <i>Water Services Act 108 of 1997</i>, which guides municipalities in their role as water service authorities and protects consumer interests.</p> <p>For the 2020–2021 period, MMLM complied with most key performance indicators (KPIs), except for water use efficiency (KPI 11). It met all service delivery access indicators, with sanitation (KPI 2) scoring 3.107, free basic water (KPI 3) scoring 3.948 and water supply (KPI 1) scoring 5. Currently, no standards are in place for access to free basic sanitation (KPI 4), as the Department of Water Affairs (DWA) has not established any.</p>

MMLM, Modimolle-Mookgophong Local Municipality; WSA, Water Service Authority.

services such as potable water has been among other reasons why there have been several protests reported across the country (Ngcamu 2019).

The social contract theory provides a framework regarding how people live together according to an agreement that establishes moral and political rules of behaviour (Loewe, Zintle & Houdret 2021). Furthermore, in its application, the *Constitution* binds both the public and private sectors. According to Arato (2017:63), despite the ideals enshrined in the *Constitution* and other related policy documents, some believe that South Africa's social contract is non-existent. For example, in recent history, some instances of civil unrest were observed in the Limpopo province of South Africa, in Vuwani town, MMLM.

According to Nkuna and Shai (2018), these protests were largely because of public dissatisfaction with the incorporation of Vuwani and some parts of Thulamela settlements into a single municipality. Nkuna and Shai (2018) argue that these violent protests, which mostly manifested in the destruction of schools and other public infrastructure, could be analysed in terms of the psychosocial and socio-economic aspects that defined the people of Vuwani town and Thulamela in 2016. At the centre of this unrest were feelings of human rights violations. Among other public property destroyed during this unrest were some water supply establishments, which also worsened the already challenged public service environment in Limpopo (Maseko 2014:12; Rakubu, Masuku & Madima 2023).

Access to an improved source of water

According to StatsSA (2020), between 2002 and 2018, the percentage of households with access to a better supply of water increased by fewer than 4% points (growing from 84.4% to 88.2%). The Eastern Cape province (+17.8%) and KwaZulu-Natal province (+10%) saw the most significant rises. Despite these significant gains, water access decreased in five provinces between 2002 and 2019. The largest decline was observed in Mpumalanga (-5.3%), Limpopo (-3.8%) and the Free State (-3.7%) (StatsSA 2020). In 2019, an estimated 44.9% of families had access to piped water in their homes. Another 28.5% drank water on site, while 12.2% drank from communal taps and 2.5% from the taps of their neighbours (StatsSA 2020). In 2019, 3.1% of families had to gather water from rivers, streams, stagnant water pools, dams, wells and springs despite substantial improvements in household access to water (StatsSA 2020).

Contextualisation of the study area

Municipalities in South Africa are divided into three categories according to Chapter 7, Section 155 of the *Constitution of the Republic of South Africa 1996*: metropolitan municipalities (Category A), local municipalities (Category B) and district municipalities (Category C). Local municipalities share executive and legislative authority with the district municipality in whose jurisdiction they are located, whereas metropolitan municipalities have sole executive and legislative authority within their jurisdictions.

The MMLM is a Category B municipality in the Limpopo province. Modimolle-Mookgophong Local Municipality was formally established by Section 12 of the Limpopo Provincial Gazette No: 2735, titled 'Notice in terms of Section 512 of the *Local Government: Municipal Buildings Act, 117 of 1998*', which addresses the disestablishment of existing municipalities and the establishment of new ones, dated 22 July 2016 (see Figure 2). The municipality covers 10497 square kilometers and has a population of approximately 110000 people, accounting for 20.2% of the district's population. Following its merger, the municipality remained a Category B municipality (MMLM IDP 2020/2021).

According to Statistics South Africa's 2016 community census, the Waterberg District Municipality had a population of 107699, including 28977 residents in MMLM. A total of 17265 households have access to water, with 6266 having piped water inside their homes, while 642 households lack access to piped water. Additionally, the water backlog remains at 4.7%, with 930 households still in need of water connections.

Water service delivery challenges in Modimolle-Mookgophong Local Municipality

Water services management and delivery are widespread challenges in South African municipalities, particularly in local or category B2 municipalities, which often face the greatest difficulties in providing residential water services. According to Clifford-Holmes et al. (2018), these municipalities, defined by the Municipal Demarcation Board (2018) as local municipalities with large townships at their core, struggle significantly. These townships, originally designated under apartheid for African people, received minimal service delivery infrastructure, leading to ongoing challenges in water service provision (Jürgens et al. 2013).

Despite assurances from authorities that water shortages are being addressed, residents in the townships of MMLM continue to experience significant water supply issues. Marcatelli and Buscher (2019) argue that MMLM's bulk water supply has not kept pace with demand, resulting in widespread water restrictions and shortages. The municipality has had to regulate water delivery because of limited resources, leading to restricted daily water flow through the distribution network (Modimolle Local Municipality 2019). As a result, residents frequently call on the government to provide water trucks to ensure access to sufficient water although these efforts often lead to interruptions lasting days or even weeks.

This study is conceptualised within the context of these challenges, focusing on the roles and responsibilities of local municipalities. Given that MMLM is a representative local municipality in South Africa, this background highlights the gap in research on water service provision in MMLM, which this study aims to address. By concentrating on the effectiveness of the MMLM mandate to supply water in the Modimolle and Mookgophong areas in Limpopo, this research seeks to contribute to improved water supply and public health. The literature indicates that access to

clean water is crucial for reducing the disease burden, and this study aims to enhance life quality through better water supply and knowledge dissemination.

Research methodology

Research methodology is an essential part of any scientific study. Mohajan (2018:23) states that research methodology is the research roadmap. In addition, it describes the methods and procedures that the researcher will use to conduct the research. According to Snyder (2019:33), the main purpose of discussing research methodology is to explain the nature and process of research to enable researchers to conduct their research to find answers to their specific questions.

Research design and approach

A mixed method was adopted for this study. This approach is generally defined as a combination of qualitative and quantitative approaches, providing both the depth and breadth of the phenomenon being studied (Dawadi, Shrestha & Giri 2021:27). A pragmatic paradigm was used for this study because it advocates a relational epistemology in which relationships in research are best determined by what the researcher deems appropriate for that particular study, a non-singular reality ontology in which there is no single reality, and all individuals have their unique interpretations of reality (Johnson & Christensen 2013; Makombe 2017; Okesina 2020).

Sampling method

To conduct an effective, efficient and ethical study of the population as a whole, a sample must be selected (Molepo 2013:73). The sample size cannot be determined when utilising non-probability sampling and is unknown until all the members have been chosen (Folley 2018). Selection continued until a large enough number was found. Previous literature has highlighted that the type of data analysis the researcher wishes to conduct may also impact the sample size (; Neuman 2011; Uttley 2019; Rahman 2023). Likewise, it was anticipated that the study would generate a significant amount of text, and a relatively small sample size was selected.

In this study, the researcher used probability and non-probability sampling techniques to select the samples for the study. Probability sampling was used to ensure the generalisability of findings and minimise selection bias, while non-probability sampling was used to provide qualitative depth and context. Both random sampling ($n = 262$) and purposive sampling ($n = 5$) methods were used to select the participants for the interviews and questionnaires to understand the context of water service delivery challenges among the community members of MMLM. Based on the research focus and objectives, the research population includes public sector professionals from the MMLM jurisdiction. These are specifically water services managers, public professionals, process controllers and their assistants.

A number of ordinary middle-class households were provided with a questionnaire to complete. Non-probability sampling was therefore used to include all skilled employees responsible for water services management.

Research instruments

For this study, two instruments were used to collect data. The first instrument was the semi-structured interviews that provided sufficient information about people's motivations and understanding of events, perceived feelings, attitudes and, more importantly, matters that provoked their thoughts about the effectiveness of MMLM in provisioning water services delivery in MMLM. The second instrument used was questionnaires to collect data from residents of MMLM. A Likert scale was used in the questionnaire and the respondents to this scale specified their level of agreement with 30 statements; however, some responses were omitted to align with the journal's requirements. The number 1 at the beginning of the scale represented 'strongly agree', 2 = 'agree', 3 = 'disagree' and at the end of the scale the number 4 represented 'strongly disagree'. Numerical and 'Yes' or 'No' questions were also added as options in the questionnaire. The data collected was able to address the research questions.

Data analysis

Data collected through the structured interviews were analysed using the thematic analysis method. The various themes and subcategories formulated through the analysis process allowed the researcher to interact with the data much simply and more effectively. The IBM Statistical Product and Service Solutions (SPSS) computer tool was utilised to analyse questionnaire data from community members. The software was chosen for this study because of its suitability for social science research, relative ease of use and comprehensive labelling (Folley 2018).

Ethical considerations

Ethical clearance for this study was obtained from the Tshwane University of Technology Faculty Committee for Research Ethics – Humanities with reference number FCRE/PM/STD/2022/06.

Results

This section presents a summary of findings from the interviews with municipal officials, existing literature and questionnaire responses from the community members of MMLM. In this section, the participants are referred to as Participant 1, Participant 2, Participant 3, Participant 4 and Participant 5.

Service norms and requirements of Modimolle-Mookgophong Local Municipality in water and sanitation

As per the MMLM IDP 2019–2020, the water and sanitation service norms and requirements include providing 24-h water

supply, offering a free basic water supply of 10 kL/M/H and drawing water from sources within a radius of at least 200 m. The Donkerpoort Dam, Frikkie Geysers Dam, Magalies Water and boreholes are the water sources for MMLM. In addition, the municipality has two water catchment areas: Donkerpoort Dam and Frikkie Geysers Dam. There are a total of 35 borehole locations, distributed as follows: Roedtan (4), Thusang (2), Mookgophong township (9), Modimolle township (7), Perdelaagte Modimolle township (1), Mabaleng (2) and Mabatlane (9) (IDP 2019/2020).

Water Service Authorities (WSAs) and Water Services Providers (WSPs) are both used by the municipality. Water, on the other hand, is one of the most limited resources in the country, particularly in the Waterberg District. The area's hydrology includes both surface and groundwater elements that might influence development, and the aridity of the Waterberg district can be a major limitation (Municipal IQ 2019). The majority of MMLM houses have access to water through yard connections, whereas all informal settlements in the MMLM obtain water through communal taps and tankers, which is a challenge for residents and draws enough interest to encourage investigation through the use of research study.

Modimolle-Mookgophong Local Municipality caters to four areas, namely, Modimolle, Mookgophong, Mabatlane and Mabaleng. The source and amount of water used in each town are described below. Modimolle is a town within MMLM and on average the town makes use of approximately 12 mL per day (Marcatelli & Buscher 2019). This town gets its water supply from the Donkerpoort Dam, which supplies about 40% of the total water used in the town. Modimolle also gets its water supply from 10 boreholes that contribute an amount of 1.56 mL per day (Marcatelli & Buscher 2019). Out of the required 12 mL, the combined system of boreholes and the dam are providing an average total system input of 7 mL per day, leaving the system with a shortfall of 5 mL/day (42%). There is an additional 0.12 mL that is supplied daily by private companies (MMLM, Annual Report, 2019/2020). However, the system remains severely constrained and incapable of meeting the existing demand. Modimolle-Mookgophong Local Municipality is therefore left with no option but to implement water rationing.

Mookgophong town's water supply is from Welgevonden Dam as well as the Nyl River Wellfield (Boreholes) (Vermeulen & Lipholo 2010). The town's current demand is 9 mL per day, with 5.1 mL per day (43%). This leaves the system with a shortfall of 3.9 mL per day (43%). There are 19 boreholes that are supplementing the system; however, they are prone to electrical and mechanical faults, causing substantial operational costs (MMLM, Annual Report 2018/2019). There is an additional 0.12 mL that is also supplied daily by private companies (MMLM, Annual Report 2019/2020). Mabatlane gets its water supply from 9 boreholes. According to the MMLM annual report (2020),

7 out of 9 of these boreholes are operational and have a storage capacity of 3–4 mL per day. The town has an average system of 1.56 mL per day, with a demand of 3.4 mL per day, leaving a shortfall of 1.8 mL per day (52%) (MMLM, Annual Report 2018/2019). The boreholes supplying the municipality are owned by a private company and the municipality is billed regularly. The last town is Mabaleng, which receives its water supply from two boreholes, with one operating and having a storage capacity of 2.5 mL per day (MMLM, Annual Report 2019/2020). Since the building of the wastewater plant and the installation of waterborne sanitation systems, demand has surged in this area. However, the current supply is sufficient to meet demand.

Because of financial limits as represented in the municipal budget, MMLM had shortfalls in the provision of basic services to its constituents. Basic community services were addressed, with a focus on bulk supply and distribution network enhancement.

Semi-structured interview findings

Findings reveal that the MMLM is not effective in provisioning water services delivery to the community because of the municipality only having operation and maintenance personnel, and these staff members perform the operation and maintenance function that is performing at about 30% of its potential. The municipality does not have personnel qualified to run at a Water Services Authority level as P1 elaborated:

'If you are operating a water treatment works, you need to employ personnel that are qualified, for example, process controllers that are qualified to do the work. Now, we do not have process controllers that are supposed to do that work. So, it is mostly our operators doing the duties of Water Services Authorities.' (P1, Municipal manager, male)

P2 also elaborated:

'In terms of the actual water services management, it must be somebody that has a water care background or water and sanitation background or civil engineering background and then moment our Water Services Manager has a chemistry background, so you have that kind of institution whereby even the people that are working under have done a bit of water care but at a lower level.' (P2, Water service manager, male)

According to P3:

'[T]he MMLM is not a fully-fledged water service authority, as it is operating at 70%, which is still 30% below what a water services authority should operate at. MMLM has been affected by a lack of resources resulting in poor service delivery. For any organization to thrive, it needs to attain a reasonable degree of self-sustainability, which requires sufficient resources. The situation in MMLM indicates that its current resource shortages will need to be addressed for the municipality to be able to offer water services to its communities.' (P3, Technical services, female)

Modimolle-Mookgophong Local Municipality WSA's inability to provide tap water to all households has led to illegal connections within the municipality. According to the MMLM annual report (2020), the municipality has been affected by outdated infrastructure when it comes to water service delivery. Infrastructure refers to the basic physical and organisational structures and facilities. P4 stated that:

'Our supply system in terms of your reticulation network is 80%, which is made up of an asbestos pipe. Therefore, during the winter season, we have normally a lot of pipe bursts, which then increases our water losses on our systems and in most of our pump stations.' (P4, Technical services, male)

P5 also elaborated:

'We often detect illegal connections during pipe bursts or when clients report issues with their meters. These are usually driven by socio-economic factors, like high unemployment rates. Most illegal connections we remove are found in car washes and residential areas where meters are bypassed. Another challenge arises with sanitation connections; some residents avoid paying for services when building or extending their homes, leading to tampering with municipal infrastructure. This creates future water problems due to blockages.' (P5, Community leader, male)

Structured questionnaire findings

The structured questionnaire was completed by the participants anonymously and was administered in the presence of the researcher. Two hundred and sixty-two of the three hundred planned survey participants completed their questionnaires. The following analysis and discussions of the quantitative study are based on the questions asked.

What is your main water source?

In response to the question about their main water source, respondents provided the following answers: 26% indicated that they obtain water from a communal tap located more than 200 m away or that they have no access to water, 14% stated that they get water from a communal tap less than 200 m away, 11% mentioned that they have metered in-house supply or a yard standpipe, 9% receive water from a neighbour's house, 23% rely on municipal water trucks, 12% have a borehole water supply and 5% gather water from a river or well (see Figure 3). These findings indicate that the majority of respondents are experiencing inadequate water service.

How many buckets of water does your household consume per day?

According to the survey, 8% of respondents use 1–2 buckets of water per day, 23% use 3–4 buckets, 45% use 5–6 buckets, 21% use 7–8 buckets and 3% use 9–10 buckets. This shows that most respondents use at least 4–6 buckets per day, depending on the size of their household.

How often do you experience water supply interruptions?

When asked about the duration of water supply interruptions, 41% of respondents reported experiencing interruptions

lasting 1 to 2 days, while 17.5% reported 7-day interruptions. Additionally, 24% of respondents experienced interruptions lasting 2 weeks, and another 17.5% reported interruptions lasting a month (see Figure 5). This suggests that only a small number of community members experience long-term water supply interruptions, while the majority only experience short-term interruptions.

Discussion of findings

This section aims to present, analyse and interpret the data collected through face-to-face interviews with municipal officials and community representatives, as well as structured questionnaires administered to evaluate the satisfaction of the MMLM community. A thematic method of qualitative data analysis was used to analyse the qualitative data. This approach complies with ethical considerations of confidentiality, which require that the names and places of work of all participants are not revealed in the study. Below are the themes derived from the study findings.

Effective service delivery in the MMLM hinges on robust public participation, yet only 52% of respondents know who provides water services in their areas, indicating a significant gap in community involvement and interaction with municipal officials (see Table 1). Table 2 comprises a summary of the study objective and findings as themes.

The study reveals a diverse range of water sources: 26% rely on a communal tap more than 200m away or have no access to water, 14% use a communal tap less than 200m away, 11% have a metered in-house supply or yard standpipe, 9% obtain water from a neighbour's house, 23% depend on municipal water trucks, 12% have a borehole water supply and 5% get water from a river or well. This distribution indicates that many community members face inadequate water service delivery. Although the standard for free basic water is 25 liters per person per day, household consumption varies, with most respondents using 4–6 buckets per day, depending on household size.

Water supply interruptions are a prevalent issue, with 41% experiencing interruptions of 1 to 2 days, 17.5% facing 7-day interruptions, 24% dealing with 2-week interruptions and 17.5% enduring month-long interruptions. While some community members face long-term disruptions, most experience shorter ones. However, there has been progress in improving water service access and quality, with 58% of respondents observing improvements in the past year, indicating a positive trend since the 2020–2021 financial year. These findings underscore the need for increased community engagement and effective communication from municipal officials to enhance service delivery and foster a more informed and participative community.

Recommendations

The recommendations of the study are based on the analysis, findings and key conclusions drawn. These suggest how

the MMLM can be effective in the provisioning of water services. These recommendations are based on the interaction of the researcher and MMLM as an institution during the period of study.

Infrastructure improvement

To provide quality and uninterrupted water to its community, the MMLM must prioritise infrastructure improvement. This will enable the MMLM to effectively and efficiently meet its water demands. The municipal budget should also allocate funds for the maintenance of this infrastructure to ensure continuous water provision.

The Municipal Water Board must enhance revenue through proper billing systems and regular maintenance. Currently, the water and sanitation sector are under-financed, leading to poor revenue and inadequate investment in infrastructure upkeep. These issues have caused the deterioration and eventual collapse of municipal water infrastructure. To prevent water service backlogs, the MMLM should allocate a budget for infrastructure maintenance.

One effective approach is to commercialise water utilities in MMLM. Literature indicates that commercial utilities (CUs) facilitate clearer role definitions among stakeholders in the water services industry. For example, CUs are typically responsible for providing water services, demonstrating a more structured and efficient management system.

Capacity development

Governance challenges, such as insufficient funding and a lack of capacity at the municipal level, have hindered the fulfilment of socio-economic rights and the implementation of policies. These issues have led to inadequate progress in achieving the goals for delivering essential water services. To address this, capacity development initiatives should be tailored to the municipality's specific needs, which can be identified through a formal needs assessment. It is recommended that resources be directed towards systematic reviews, such as the framework for RPMS, to ensure that projects have a meaningful impact on the delivery of water services.

The local government's civil engineering capacity is critically low, affecting the ability to deliver, operate and maintain infrastructure sustainably. The number of engineers has drastically decreased from 20 per 100 000 people in 1994 to just three per 100 000 people, highlighting a severe shortage. To ensure effective water service delivery, it is imperative to employ more engineers and enhance municipal capacity.

Improving service delivery requires municipalities to expand their range of skills. Enhanced communication between the municipality and citizens can help service providers better understand and address community needs. Better financial planning is crucial for optimising the use of available funds, and improved technical skills will lead to more efficient delivery of municipal services.

To support these improvements, the municipality's Human Resource Management should prioritise hiring skilled and experienced individuals capable of implementing policies and strategies to improve water services. Additionally, the Water Services Authority of MMLM should establish learnerships and internships to train candidates, helping the Authority become fully operational. These measures will significantly benefit the municipality and its service delivery.

Cost recovery system

Cost recovery in low-income areas has been a significant challenge for the municipality. To address this issue, Department of Water Affairs (DWA) and the Department of Cooperative Governance and Traditional Affairs should provide support. Budgetary constraints and a lack of payment for services are key factors affecting municipal performance. In some communities, there is a misconception that municipal services are free, but residents must ultimately pay for the services they receive.

Effective financial planning and pricing in the water sector require a balanced approach to revenue generation, combining water use charges, tariffs, grants and transfers for sustainable cost recovery. Commercialisation is needed in the MMLM to improve the collection of rates for services.

Commercial utilities in Zambia provide a useful model, as they have successfully enhanced their service delivery capabilities, including customer complaint handling, billing, customer relations and maintaining water quality, pressure, and flow. As expected in a commercialised setting, revenue collection has seen the most significant improvements among these utilities.

Community participation

Community members should be actively encouraged to participate in local government matters. This involvement ensures they are informed about the municipality's strategies to address challenges they face. For example, issues like illegal water connections, which hinder effective water supply in the MMLM, can be identified and addressed at the community level. Community members play a crucial role in reporting such illegal activities.

Other African countries, such as Uganda, provide successful models of community involvement. In Uganda, communities participate in local government through consultative approaches, including mass meetings. Similarly, in Mbabane, community mass meetings ensure information reaches even the lowest levels of the community. These meetings brief residents on key development projects and other local concerns.

Implementing similar approaches in MMLM can enhance community involvement in local government issues, leading to more effective water provisioning. By fostering a collaborative relationship between the municipality and its

residents, MMLM can better address and resolve local challenges.

Conclusion

In conclusion, the persistent failure of many South African municipalities to fulfil their constitutional mandate is intricately linked to the lack of essential skills and capacity among municipal officials. This deficiency directly impacts the quality and effectiveness of municipal service delivery, exacerbating socio-economic challenges within communities. The specific challenges faced by MMLM underscore the urgent need for systemic reform. Implementing robust policy regulations that prioritise accountability and transparency within municipal operations is imperative. Such regulations would provide a framework for ensuring that municipalities adhere to standards of governance and are held responsible for their actions. By fostering an environment of oversight and compliance, these policies can help drive meaningful improvements in service delivery and ultimately contribute to the socio-economic development of South Africa's communities.

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Competing interests

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Authors' contributions

T.C.S. contributed to the conceptualisation, literature review, methodology, results, recommendations and writing the original draft of the study and also participated in the writing, review and editing of the manuscript. J.N.M. and C.M.M. contributed to the conceptualisation, methodology and results of the study and assisted in writing, reviewing and editing of the manuscript.

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Data availability

The data that support the findings of this study are available from the corresponding author, T.C.S., upon reasonable request.

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