

Research Paper

Qualitative study of drinking water, sanitation, and hygiene access: perspectives from the Central Gonja District, Ghana, and Mtubatuba Municipality, South Africa

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ABSTRACT

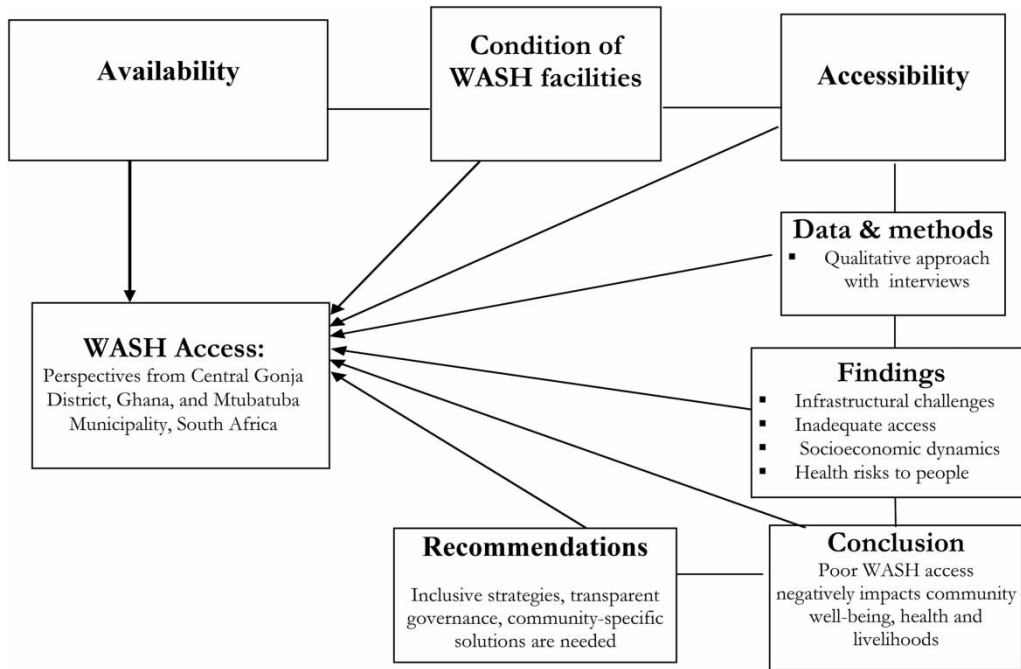
Water, sanitation, and hygiene (WASH) are essential for human development. Lack of WASH facilities affects livelihoods and health of communities. Assessing the state, availability, and accessibility of WASH systems is vital for identifying gaps and formulating proactive solutions. This study assessed drinking water and sanitation access in the Central Gonja District (CGD) and Mtubatuba Municipal areas, using qualitative methods and in-depth interviews with participants. Findings revealed persistent challenges of inadequate, unaffordable, and inaccessible water, along with subpar sanitation services, negatively impacting community well-being and health. Issues like corruption, favouritism, and social networks influenced distribution of water and sanitation systems. Infrastructure limitations, bureaucratic obstacles, and ineptitude of officials posed barriers to service delivery, exacerbated by rural -urban population shifts. A public -private partnership between Novubu and Mtubatuba Municipality enabled water treatment, showcasing a potential model for sustainable water provision and possible replication for CGD. The study advocates for transparent governance, community-centric solutions, and inclusive strategies to address chronic challenges, emphasizing the importance of proactive leadership and maintenance to prevent environmental degradation and health risks. The local governance systems should ensure the distribution and maintenance of water and sanitation systems while emphasizing the need for inclusive, community-driven approaches for lasting improvements.

Key words: Central Gonja District, Ghana, health, Mtubatuba Municipality, sanitation, South Africa, water

HIGHLIGHTS

- Safe water, basic sanitation, and hygiene (WASH) are essential for human development.
- We assessed the state, availability, and accessibility of WASH systems.
- Corruption, favouritism, and personal connections influenced the distribution of water and sanitation systems.
- Traditional governing systems are recognized as vital for the distribution and maintenance of water and sanitation systems.

GRAPHICAL ABSTRACT



1. INTRODUCTION

The availability of safe drinking water and adequate sanitation services is essential for the well-being and health of communities. Kanyagui & Viswanathan (2022) assert that maintaining life requires access to clean water and proper sanitation, and its lack or scarcity can have detrimental effects on livelihood and health. Access to clean drinking water and proper sanitation facilities is a basic human right recognized by goal six of the Sustainable Development Goals (SDGs) of the United Nations (Weststrate *et al.* 2019). However, many communities around the world, including those in the Mpukunyoni area and Jenikura still face challenges in obtaining these essential services. This situation can have severe implications for public health, leading to the spread of waterborne diseases and compromising the overall quality of life (Baker-Austin *et al.* 2018). The World Health Organization (WHO) estimates that 80% of all sicknesses and diseases in the world are attributable to inadequate water, sanitation, and hygiene (WASH) maintenance (WHO & UNICEF 2014). This is the result of drinking contaminated water, water acting as a breeding ground for carriers of diseases or diseases caused by not washing or a lack of water. The health consequences of poor WASH are enormous (WHO & UNICEF 2015). Understanding the existing condition of existing infrastructure, the adequacy of facilities, and the level of accessibility are crucial steps in identifying potential gaps and developing effective solutions. Water is a basic need for every community and without it, people cannot live (Department of Water Affairs and Forestry (DWAF) 2017). Even though South Africa and Ghana differ in terms of geophysical features and population size, their socio-economic characteristics are similar.

In South Africa, it is the responsibility of every municipality to provide basic needs to communities (Mosweu & Rakemane 2020). However, the Mpukunyoni area, situated within the Mtubatuba Municipality, faces challenges regarding access to drinking water and sanitation services. The Mpukunyoni area is a rural community located in the province of KwaZulu-Natal, South Africa. Like many other rural areas in the country, it has been grappling with inadequate access to safe drinking water and proper sanitation facilities for a considerable period of time. Access to safe drinking water remains a persistent challenge. Many residents rely on limited water sources, such as communal taps or untreated water from rivers and boreholes. Toilet facilities are critically lacking, with open defecation becoming more prominent. The lack of access to clean water and proper toilet systems increases residents' risk of waterborne diseases, including diarrhoea, cholera, and typhoid (Fazal-ur-Rehman 2019). South Africa's history has been marred by a legacy of service delivery backlogs in various communities, particularly impacting black communities. The apartheid regime systematically deprived these communities of essential services such as water and electricity, leading to enduring disparities (Kathman & Benson 2019). Even after the

democratic transition in 1994, service delivery imbalances persisted, with the constitution favouring white communities and leaving black communities underprivileged. In response to these inequities, the African National Congress (ANC) assumed power and introduced new policies, regulations, and Acts, including the 1996 Constitution, which affirmed the right of every citizen to access water and social security (Olivier & Govindjee 2021). To actualize this right, the Water Act of 1998 was enacted, ensuring that all South Africans could enjoy basic water and sanitation services while safeguarding water resources for the collective benefit. In 2001, the policy on free water supply was introduced to provide essential relief to vulnerable households, stipulating that poor families should receive up to 6,000 litres of free basic water each month (Bond 2019). Local governments were assigned the critical responsibility of addressing the needs of their communities through the Municipal Systems Act. Despite these legislative and policy measures, numerous communities, including those residing in the Mpukunyoni area, continue to face challenges in accessing these vital services. Persistent service delivery backlogs have created hardships, hindering progress and perpetuating inequality.

It appears that Ghana and South Africa's urban and rural areas have seen different levels of progress in the provision of water services. In Ghana, the sanitation situation in all regions is far below the SDG targets, with the Northern, Upper East, Upper West, Savannah, and Volta Regions presenting the worst situations. It is noteworthy that the least-performing regions for sanitation are also the same for water. In general, access to water is good throughout Ghana, with the exception of the Northern region, which stands at 50%, and the Volta region, which stands at 59% (Kanyagui & Viswanathan 2022). The Jenikura community situated in the Central Gonja District (CGD) of the Savannah area is not different from the challenges associated with access to drinking water and sanitation services. The community has at least 31% safe water coverage. The situation with sanitation in the district seems to have seen some improvements. In addition to ranking 13th in the WASH League Table in 2016, 9th in 2017, and 12th in 2018, the district as of the end of 2017 had proclaimed and recorded 48 out of 260 settlements to be free of open defecation (Central Gonja District 2018). The lack of WASH access has had effects on the health, well-being, and overall quality of life of community members. The availability of clean drinking water is a fundamental necessity for human survival and plays a vital role in preventing waterborne diseases (Pal *et al.* 2018). Despite the perpetual nuance associated with access to water, most residents of Jenikura rely on limited sources such as dams, dugout pits, and boreholes whose sources are often untreated. According to Bazaanah (2019), high operating and maintenance costs make it difficult for many local authorities to manage and expand water supply projects. Additionally, endemic poverty, low water tariffs, and fees for rural sanitation services do not seem to generate enough revenue to sustain the rural water and sanitation sector. This study investigates community perspectives on factors affecting access to WASH services in the CGD and Mtubatuba Municipality, by examining the condition of existing facilities, service delivery obstacles, and strategies to address these issues. The study contributes to the efforts of ensuring that the constitutional rights to water and sanitation are upheld for all, thereby, fostering more just and inclusive communities.

2. THEORETICAL AND EMPIRICAL LITERATURE

The approaches to water and sanitation service delivery encompass a set of processes aimed at ensuring equitable access to water and sanitation facilities. For instance, the decentralization approach aims to transfer decision-making authority from central governments to lower levels of governance, with the aim of enhancing service delivery, participation, and accountability (Azfar *et al.* 2018). In terms of water and sanitation service delivery, decentralization allows for more efficient and effective decision-making as it brings decision-making closer to the people who are directly affected by those decisions. It also promotes local ownership and empowerment, as communities have a greater say in shaping policies and programmes that directly impact their lives. Despite its potential benefits, gaps in the literature exist, including conceptual ambiguities, uncertain effects on service delivery, insufficient attention to power dynamics, and challenges related to capacity and administration (Walter 2021). As the local agency mandated to provide services, Districts and Municipalities must consider contextual factors like political, social, and economic conditions to ensure successful decentralization efforts for water and sanitation services. These contextual factors can include the level of government support and funding, community engagement and participation, as well as the availability of resources and infrastructure. Additionally, political stability and governance structures can play a crucial role in determining the effectiveness of water and sanitation services (Ngema 2022). It is also essential to assess the local cultural beliefs and practices surrounding water and sanitation, as they can impact community acceptance and adoption of new systems or technologies. This is critical because, where there is a lack of government support and funding, decentralized structures may struggle to

secure the necessary resources to provide adequate water and sanitation services. Furthermore, without active community engagement and participation, the local population may not fully embrace or take ownership of the decentralized initiatives, leading to potential challenges in sustaining these services in the long run (Gwala 2022). These gaps highlight the need for further research and analysis to fully understand the complexities and implications of decentralizing water and sanitation service delivery to local agencies. Embedded in the advocacy for decentralization is the idea of enhancing human rights to water and sanitation delivery. The human rights approach emphasizes the centrality of human rights in guiding policies, practices, and strategies related to the provision of clean and accessible water and sanitation services at the local government level. It places individuals and communities at the core of decision-making processes and seeks to ensure that their rights to water and sanitation are fulfilled without discrimination while promoting accountability and participation (Azfar *et al.* 2018). At the local government level, the human rights-based (HRB) to water and sanitation involves integrating human rights principles into all aspects of planning, implementation, and monitoring of water and sanitation programmes. This means recognizing water and sanitation amenities as essential human rights rather than mere commodities. Local governments are responsible for upholding these rights, ensuring equitable access for all, particularly marginalized and vulnerable groups, and addressing systemic barriers that hinder access to these services. Central to the HRB is the idea of non-discrimination, which requires local governments to eliminate discriminatory practices that might hinder certain groups from accessing water and sanitation services. This could involve addressing socio-economic disparities, gender-based inequalities, and other forms of discrimination that disproportionately affect certain segments of the population (Makaudze *et al.* 2012).

2.1. Water and sanitation service delivery challenges in Ghana

Over the past decades, Ghana's economic growth has advanced significantly (Government of Ghana 2019). However, there are complications associated with the transition to lower middle-income country (LMIC) classification, including changes to the system, reorganization of institutional roles, development financing, and aid flow concerns (Goksu *et al.* 2019). Persistent disparities in the delivery of WASH services and rising urbanization have a negative influence on water supply and municipal sanitation services. The disparities in providing WASH services are concerning (Asante & Amoah 2018), indicating the need for precise targeting to reach marginalized groups in communities, schools, and health centres. While urban centres often have relatively better WASH facilities, rural communities struggle with limited access to safe drinking water and proper sanitation services. Additionally, Ghana grapples with unreliable water supply systems, exacerbated by factors such as climate change, population growth, and inadequate maintenance (Osman *et al.* 2019). These challenges contribute to waterborne diseases and perpetuate the cycle of poverty, as communities spend valuable time and resources on coping with health issues related to poor water quality and inadequate sanitation (World Bank 2019). Although there are well-defined roles, responsibilities, and policies at all government levels, challenges in financial and human resources persist, impeding effective and comprehensive service delivery. Furthermore, contributions from development partners have declined, partly due to Ghana's attainment of LMIC status and some donors' inability to continue providing grants due to changes in their domestic policies. Despite Ghana achieving an impressive 89% water coverage rate in 2015 according to Millennium Development Goal (MDG) basic services criteria, significant access inequalities persist among rural-urban areas, affluent and impoverished populations, women/girls, and men/boys. Even the inadequate sanitation coverage of 15% at the conclusion of the MDG in 2015 reflects rural-urban disparities. When assessed against the safely managed criteria of the Sustainable Development Goals (SDGs), Ghana's water coverage drops substantially to around a 26.9% baseline figure (National Development Planning Commission 2018). Key impediments to addressing WASH inequalities and achieving universal access include heavy dependence on donor funding (comprising over 80% of the WASH budget), insufficient public investment, and limited utilization of private sector resources. Additionally, inefficiencies stemming from poor revenue collection, high levels of non-revenue water, inadequate functionality, and elevated operating costs impact agencies' capacity to expand utility coverage and maintain services (Government of Ghana 2019).

The health of people and the environment depends on having access to clean drinking water as well as better sanitation and hygiene (Nidhi *et al.* 2019; Behera *et al.* 2022). They serve as a means of advancing global development and social justice. The Sustainable Development Goals (SDGs) include eradicating open defecation by 2030, providing everyone with appropriate sanitation and hygiene, and ensuring that everyone has equitable access to safe and cheap drinking water. These ideal conditions are still far from being reached, which is not good news for people's health, particularly in developing nations like Ghana (Osarfo *et al.* 2023).

2.2. Water and sanitation service delivery challenges in South African municipalities

South Africa is a middle-income, developing country characterized by unequal income distribution. Income disparities are reflected in the provision of basic services such as water and sanitation (Lenka 2022). Urban areas are faced with the challenge of informal settlements which have mushroomed as a result of rural–urban migration (Marx & Charlton 2003). Informal settlements in South Africa are characterized by high population density, inadequate water and sanitation, and poor hygiene conditions (UN 2005). In Kwazulu-Natal province, the uMkhanyakude District as a whole has an estimated one million people living in densely populated settlements. Although safe water and appropriate sanitation are considered to be basic human rights in South Africa (Makaudze *et al.* 2012), the Department of Water Affairs (DWA) (2008) affirms that close to 6 million South Africans do not have access to safe drinking water. Furthermore, the pace of sanitation delivery is low. According to the national 2012 report on the status of sanitation, 11% of South African households do not have access to sanitation services. Water-related diseases such as diarrhoea are said to claim millions of lives each year in different areas (Osiero *et al.* 2019).

The standard for a basic water supply set in the Reconstruction and Development Programme (RDP) in South Africa is 25 L of potable water per person per day within 200 m of each dwelling (Cole *et al.* 2018). However, South Africa is facing the challenge of low water coverage, especially in rural areas (Manase *et al.* 2009). According to the National Sanitation Policy (1996), approximately 21 million South Africans do not have access to adequate sanitation (South African Government 1996). In 2023, estimates show that 76% of people have access to basic sanitation, while 93% of people have access to water delivery services. Nonetheless, compared with urban areas, the percentage of people utilizing better water and basic sanitation sources in rural areas continues to be significantly lower (Bazaanah & Mothapo 2023). Inadequate methods include the bucket system, pit toilets, and poorly designed waterborne sewage systems persist, increasing the risk of health infections. Potgieter *et al.* (2007) found that people who lacked adequate sanitation and were waiting for the government to provide ventilated improved pits (VIP) resorted to building their own VIP latrines.

However, these latrines provided neither safety nor privacy as they were not built according to the VIP guidelines. Poor sanitation has a significant impact on the quality of life as well as a community's education and development opportunities. The sanitation sector in South Africa is faced with the challenge of the ongoing growth of formal and informal settlements particularly in urban areas due to rural–urban migration, and population growth as well as an increase in the number of foreign nationals resident in the country. In 2009, there were approximately 2,500 informal settlements with 1.2 million households which posed a significant challenge (South African Government 2012). In addition, there is a high rate of theft in steel and copper pipes and dustbins. This practice poses a challenge for the municipality to deliver water and sanitation to the community. They strike and break the toilets and bins provided for them. The strikes in South African communities have greatly hindered the supply of water and sanitation services to their communities (Marutlulle 2021). Moreover, disparity in the distribution of water is another factor that affects access to water in South African communities. According to Jones (2013), disparities in the distribution of water persist, particularly among disadvantaged groups of people. People with disabilities represent the largest socially excluded groups. In LMICs, they have disproportionately limited access to water and sanitation (Water Aid 2011). Many people decide to make their own illegal pipe connections for diverting water and some connect wrongly which poses a challenge for the municipality to deliver a better service to them (DWA 2017). The provision of sustainable water requires funding. Financing is intended to come from cross-subsidization through user tariffs (Sinha 2021). Most South African municipalities rely on funding from the national government, and the challenge is compounded by the fact that citizens do not contribute financially for the services they receive, making it challenging to effectively deliver these services to communities. In addition, the shortage of skilled professionals in water and sanitation poses a significant challenge for delivering effective services in municipal areas. This shortage particularly affects the execution of quality water and sanitation services in informal settlements (Pilusa & Kanyane 2020).

2.3. Legislative frameworks for WASH delivery

2.3.1. Case of South Africa

The legislative framework on water and sanitation delivery in South Africa delineates the legal structure governing the management and provision of water and sanitation services in South Africa. The Water Services Act (WSA 108 of 1997) is an essential piece of legislation providing water services to family units and other municipal water clients by local governments. WSA promotes right of access to essential water supply and basic sanitation and protects water sources (Loucks & Van Beek 2017). It is crucial that the wellness of every citizen is given recognition so that growth and development become a reality.

Though service delivery practices and a focused commitment by municipal officials can influence growth and sustainable development (McGahey 2022), the implementation of the WSA in South Africa is riddled with a range of intricate challenges.

First, the Act seeks to provide universal access to water services, but the country's historical legacy of apartheid has left deep-seated inequalities in access to basic services. This resource for ensuring equitable distribution of water resources and services across diverse urban and rural areas remains a hurdle. The Act's objectives of improving infrastructure, service quality, and affordability must contend with these historical disparities, which require substantial investments and targeted interventions to uplift underserved communities. Secondly, the Act mandates the establishment of decentralized governance structures for water services, involving collaboration between national, provincial, and local authorities. WSA governs community's rights to access water supply. It outlines the framework and guidelines for developing a water supply plan for the community.

The Mtubatuba Municipality must therefore adhere to these guidelines, ensuring that every household receives access to water, and recognizing it as a fundamental necessity. This commitment to compliance benefits the community. In many municipalities, particularly those in rural areas, the Act has not been implemented. This is not due to a lack of willingness on the part of the municipality to comply, but rather a result of challenges related to insufficient infrastructure and limited resource availability. Similarly, the Municipal Systems Act (MSA no 32 of 2000) gives the techniques and apparatus to empower districts to inspire their groups monetarily and socially and ensure the provision of fundamental services. It seeks to engage low-income people and guarantee that municipalities build up service tariffs and credit control arrangements that consider their needs (Mitlin & Walnycki 2020). The Act mandates municipalities to design and implement integrated development plans (IDPs) for the development of their jurisdictions. Thus, the IDPs are core in the delivery of services such as WASH within municipal areas. Despite the importance of the MSA, challenges persist with its implementation. A notable challenge relates to 'capacity constraints faced by municipalities, particularly in rural and economically disadvantaged areas. Limited financial resources, inadequate skills, and staffing issues hinder the proper implementation of the Act's provisions, affecting various aspects such as service delivery, financial management, and effective administration. This challenge has been recognized by the South African government, leading to efforts to strengthen capacity-building initiatives at the local level to enhance implementation' (National Treasury 2020).

In addition, the Free Basic Water (FBW) policy was implemented in South Africa with the intention of ensuring fair access to a minimum standard of water services for all residents, particularly those residing in at-risk and economically disadvantaged communities (Department of Water and Sanitation (DWS) 2019). The policy, which was implemented as part of the nation's commitment to address historical injustices and enhance living conditions, aims to give households in need a lifeline amount of water at no cost. This lifeline amount is meant to cover basic domestic needs like drinking, cooking, and sanitation while promoting social inclusion, public health, and dignity. The goal of the policy is to alleviate poverty, lower health risks, and promote broader socio-economic development by ensuring access to a minimal level of water services. The FBW policy's implementation in South Africa has run into a number of obstacles in spite of its admirable goals. The strain on the already under-resourced water and sanitation infrastructure is a significant issue (Wright 2018). Free basic water for many households raises the demands on water treatment and distribution systems, which could result in overuse and poor infrastructure maintenance. The policy also has problems with accountability and sustainability. Free basic water may unintentionally discourage efficient water use and conservation, resulting in waste and hampering long-term water availability. The implementation of the policy has also revealed disparities in its coverage and effectiveness across different regions reflecting the broader socio-economic inequalities that persist in South Africa (Zhou & Woodhouse 2018).

Even though the South African government has put in place a number of systems to ensure the sustainability and availability of water in rural communities, these populations still lack access to safe drinking water. In last-mile cities and rural areas, municipalities commonly use trucks to deliver water. The local committees should be informed of the days when the water tanks will be coming to enable them to prepare their containers to receive water supply. In areas where the local government cannot provide water, they have to make means by themselves to buy water and also buy JOJO tanks so they can fill them up to store and use water for longer periods than day-to-day usage (Mitlin *et al.* 2019). As a means of improving service delivery, water collecting tanks were created, wells were refurbished, and new ones were built. In addition, efforts have been made to strengthen governance and management structures within municipalities, focusing on improving oversight, transparent decision-making processes, and efficient resource allocation (Jones 2013). The South African government should work towards creating a regulatory environment that promotes accountability and transparency in water and sanitation management (Muller 2018).

2.3.2. Case of Ghana

Ghana has made strides in developing policies and laws to address WASH challenges. One notable legislative instrument is the Ghana Water and Sanitation Sector Policy (GWSSP), which outlines the government's commitment to achieving universal access to safe and affordable drinking water and improved sanitation services. The Water Resources Commission (WRC) Act (Act 522 of 1996) established the WRC, tasked with managing and regulating the country's water resources. This act plays a pivotal role in ensuring sustainable water use and availability for various sectors, including domestic use. Additionally, the [Environmental Sanitation Policy \(2010\)](#) focuses on promoting proper waste management and environmental hygiene to enhance public health. Again, in 1998, the Community Water and Sanitation Agency (CWSA) Act (Act 564 of 1998) created the CWSA, responsible for facilitating the provision of water and sanitation services in rural and peri-urban areas. This agency collaborates with local communities, emphasizing community participation and ownership in WASH initiatives. Another key legislation is the Local Government Act (Act 462 of 1993), which decentralizes governance and empowers local authorities to play a role in the planning and implementation of WASH projects within their jurisdictions. Moreover, the Public Health Act (Act 851 of 2012) was enacted to address public health concerns related to water quality and sanitation. It provides a regulatory framework for monitoring and controlling waterborne diseases. Ghana has also ratified international agreements to strengthen its commitment to WASH. The country is a signatory to the SDGs, particularly Goal 6, aiming to ensure water and sanitation delivery for all. Despite these institutional and legislative efforts, challenges persist in the implementation and enforcement of WASH policies in Ghana. Issues such as inadequate funding, weak institutional capacity, and the need for improved community engagement remain critical areas for attention. Continuous efforts are essential to address these challenges and ensure effective WASH service delivery and adapting to emerging WASH issues and ensuring sustained progress in Ghana's WASH sector. Additionally, investing in capacity-building and training programmes for local professionals in water and sanitation management is vital (Sinha 2021). This can help address the shortage of skilled personnel, ensuring that municipalities have the expertise needed for successful project implementation and long-term service sustainability (DWAF 2017). This approach aligns with the SDGs, particularly Goal 6, which aims to ensure the availability and sustainable management of water and sanitation for all. Furthermore, community engagement and empowerment play a pivotal role in addressing water and sanitation challenges. Initiatives that involve local communities in decision-making processes, educate them about sustainable water usage practices, and encourage community-driven solutions contribute to the overall success of water and sanitation projects (Wright 2018). Engaging communities in the planning and decision-making process fosters a sense of ownership and encourages responsible water use and maintenance of sanitation infrastructure.

In addition, educational campaigns can raise awareness about the importance of sanitation practices and the sustainable use of water resources (Zhou & Woodhouse 2018). By empowering communities, projects are more likely to achieve long-term success as residents become active participants in maintaining and protecting their water and sanitation infrastructure (DWAF 2017). Moreover, collaborative efforts between government agencies, non-governmental organizations (NGOs), and the private sector are essential to mobilize resources effectively and implement innovative solutions for sustainable water and sanitation delivery (Pilusa & Kanyane 2020). These collaborative efforts can help address the challenges of limited funding and expertise in water and sanitation projects. Additionally, raising awareness and educating communities about the importance of proper sanitation practices can lead to behaviour change and improved hygiene practices, further contributing to sustainable water resource management.

3. STUDY AREAS, DATA, AND METHODS

The study was conducted in selected communities in Ghana and South Africa, between October and November 2023. In Ghana, the data were collected from Jenikura, a rural community in the CGD (Figure 1), with about 652 households' population (CGD 2018), while in South Africa, the study was conducted at the Mpukunyoni community (Figure 2) of the Mtubatuba Municipality, with about 34,905 household population. Both Jenikura and the Mpukunyoni area were selected because they share common challenges concerning water and sanitation delivery due to their rural settings and inadequate access to clean water and proper sanitation facilities. The lack of safe water access heightens the risk of waterborne diseases, impacting community health and well-being (Mosweu & Rakemane 2020). However, differences arise from their geographical locations, legislative frameworks, historical contexts, and community-specific challenges, influencing the nuances of how these issues manifest and are addressed in each area. The study adopted qualitative

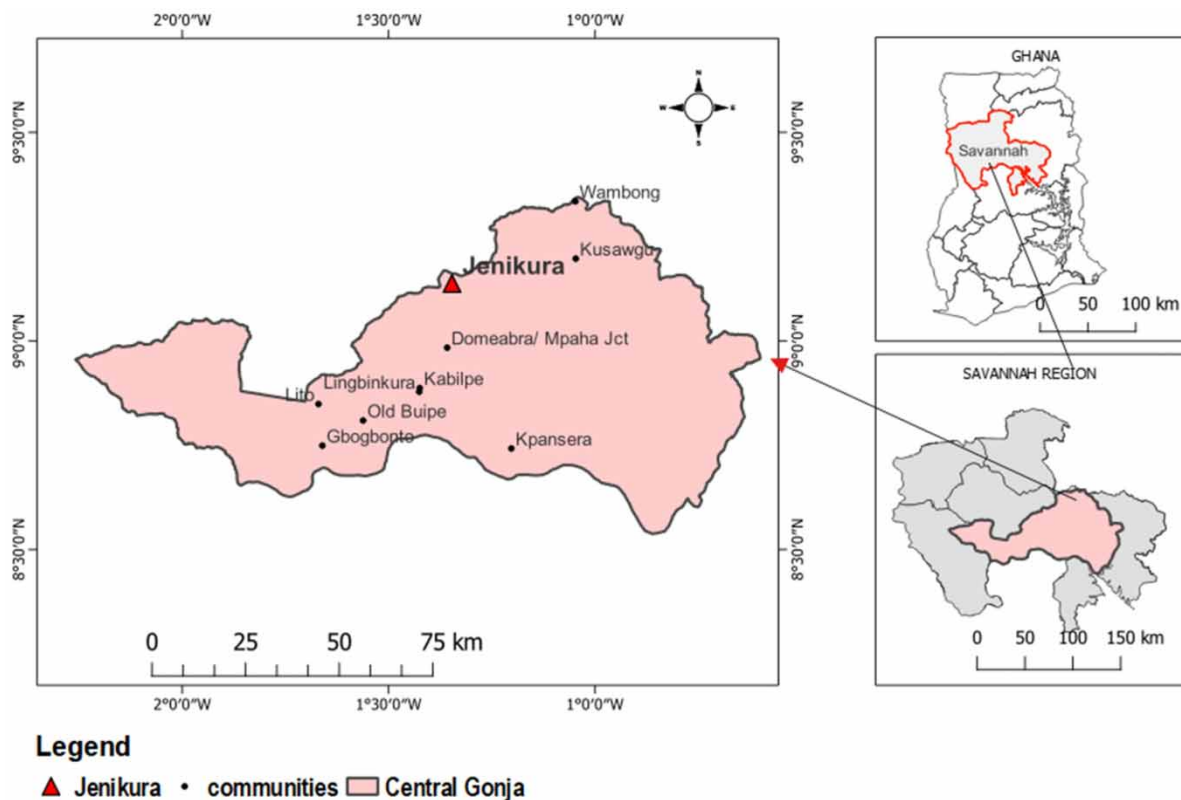


Figure 1 | Location map of the Jenikura community in the district, regional, and national context.

method approaches (Babbie 2015), entailing in-depth interviews with institutional experts, and focus group discussions (FGDs) with household heads and community leaders. The qualitative approach enabled the study to uncover nuanced perspectives and capture rich contextual insights from different groups that would not have been achievable through quantitative methods. The sampling, sample size, and sample distribution are illustrated in Table 1.

The study involved a total of 98 participants from both study locations of Ghana and South Africa. In Ghana, 50 participants were selected from the Jenikura community, and the sample distribution was composed of 20 key expert interviews, and 30 focus group discussants (composed of 25 household heads and 5 community leaders) (Table 1). In total, five FGDs composed of six memberships (both male and female) were held at the Jenikura community. In South Africa, 48 participants were selected from Mtubatuba, composed of 30 household heads, 6 community leaders, and 12 key informants/experts (Table 1). In total, six FGDs composed of six memberships (both male and female) were held at the Mtubatuba community. In each of the study locations (Figures 1 and 2), the key experts were selected using the purposive sampling approach. This method allowed the study to interact with experts who could provide valuable insights and information on the subject matter, enhancing the depth and relevance of the data collected. The criteria for selection of key experts included persons with experiences and knowledge related to WASH service delivery in both localities. They included local government officials (responsible for water and sanitation policies and implementation), engineers (with expertise in water and sanitation infrastructure design and maintenance), public health officials (with expertise in waterborne diseases prevention and sanitation promotion), environmental scientists (with experience in water quality and pollution control measures), and representatives from NGOs actively involved in water and sanitation projects and advocacy in the study areas. Meanwhile, the quota sampling approach was used to select the household heads and community leaders (including chiefs, queen mothers, linguists, and tindana) to participate in separate FGDs. The criteria for selection of household heads were based on their primary role as decision-makers and providers for the household, who are often responsible for tasks such as financial management, resource allocation, and ensuring the well-being of household members. In each FGD, discussions were halted when the facilitators noticed the presence of

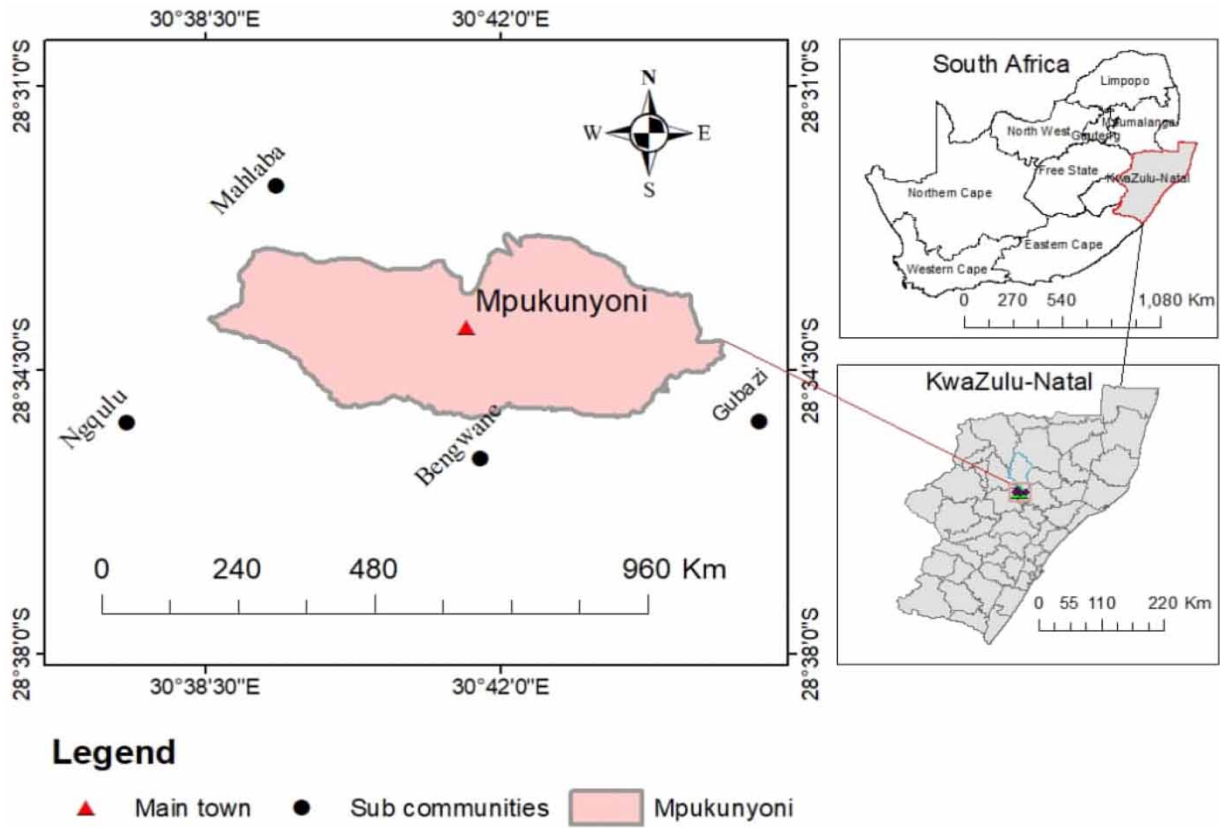


Figure 2 | Location map of the Mtubatuba community in the municipal, provincial, and national context.

Table 1 | Sample distribution of the study participants

Country/community and sampling criteria	Household heads	Community leaders	Key experts	Sample
Ghana (Jenikura)	25	5	20	98
South Africa (Mpukunyoni)	30	11	12	
Selection criteria	Quota sampling		Purposive sampling	

repetitions, redundancies, and similarities in the collected information. This stage of data saturation is crucial in qualitative research, indicating that researchers have gathered enough information to achieve a comprehensive understanding of the topic. This decision prevents resources from being wasted on redundant or repetitive data.

The study recruited local interpreters, who were used as translators to aid group discussants in understanding the topics discussed in their local dialect. In addition, research assistants were hired and trained to support the implementation of the research activities, including the reconnaissance trips and the main field data collection exercises. The translators were necessary to ensure effective communication, but they also introduced challenges such as nuances lost in translation and ensuring accuracy and cultural sensitivity in conveying meanings across the local languages.

The interviews were audio-recorded, transcribed, and analysed using the Nvivo software, enabling efficient data organization and identification of recurring themes and patterns and allowing for comprehensive analysis of the collected information. The study received ethical approval from the Council for Scientific and Industrial Research (Ghana), the Management College of South Africa’s ethics committee, and consent from the participants and the local authorities. The study maintained objectivity by using local languages, ensuring voluntary participation, and confidentiality of participant information (using consent forms and pseudonyms), adhering to ethical guidelines, and respecting participants’ rights, thereby ensuring the integrity and trustworthiness of the research findings.

In presenting the results, several criteria were employed to ensure the quality and relevance of the data. First, responses were evaluated based on their alignment with the research objectives, ensuring that only information directly contributing to the study's focus was included. Additionally, clarity and coherence were essential criteria, with responses needing to be understandable and logically structured. The adequacy of data provided by participants was critically considered, with preference given to responses containing sufficient detail and depth to contribute meaningfully to the study. Any participant responses that did not meet these specified criteria or were deemed irrelevant, unclear, or inconsistent were excluded from the results.

4. RESULTS AND DISCUSSION

This section examines the state of water and sanitation infrastructure in the communities, assessing their adequacy and accessibility. It also identifies the systemic challenges, socio-economic factors, and obstacles that contribute to backlog in service delivery. Finally, the analysis proposes and discusses strategies to address the context-specific challenges confronting the study communities.

4.1. State of water and sanitation facilities in Jenikura and Mpukunyoni communities

Access to clean water and proper sanitation is fundamental to human well-being, impacting health, dignity, and overall quality of life. The participants had varied opinions regarding the availability, quality, and accessibility of water sources, as well as the adequacy of sanitation facilities. For instance, in the Mpukunyoni community, Participant 1 said: 'since I have stayed in the area from the time I got married in 1992, the area has never had a supply of clean water no sanitation services also provided, even doing laundry and cooking is a big challenge because no living being can leave without clean water, but water has now become expensive often beyond my capacity to afford'. This view was reiterated by Participant 2 who said that 'I was born in the area and has never had services from the municipal WASH department. The only thing I remember is that we had functional boreholes during my school times, but due to them not being serviced they are not functional anymore. We now struggle to buy water from our already low incomes'. The statements by Participants 1 and 2 underscored the gravity of the water and sanitation situation in the Mpukunyoni community. In stating that there has been no supply of clean water or sanitation services, the participants highlighted the long-standing and chronic nature of the issue. The inability to access clean water is not only a basic necessity for daily activities like cooking and laundry but is also framed as an indispensable element for sustaining life in the community. The emphasis on the essential role of clean water suggests that the community has endured a prolonged lack of basic infrastructure, affecting various aspects of daily life. They also mention the deterioration of functional boreholes, which were once available but have since become non-functional due to lack of maintenance and servicing. Non-functionality of WASH facilities can affect adequacy, affordability, and access to services since the absence of readily available and adequate services can compel community members to seek more expensive alternatives. The non-functionality of existing water sources further exacerbates the community's water needs. These findings are critical as they illuminate the urgency of addressing these deficiencies and emphasize the critical need for interventions to improve water and sanitation services in the Mpukunyoni community with potential implications for the health and overall well-being of their residents. These accounts emphasize the urgent need for policy interventions to address infrastructure maintenance, service provision, and long-term sustainability in water and sanitation management. The findings reiterate the need to enforce regulations and policies like the FBW, the MSA, and the WSA guidelines on water and sanitation services. Policymakers should prioritize investment in infrastructure upkeep, community engagement in decision-making processes, and equitable access to clean water and sanitation services, ensuring the realization of basic human rights and improved public health outcomes. The findings corroborate [Lenka \(2022\)](#) who discovered disparities in the provision of basic services such as water and sanitation in the Bhubaneswar City. Again, earlier studies point to disparities of coverage and ineffectiveness of the regulatory frameworks like the FBW, the MSA, and the WSA across different regions, reflecting the broader socio-economic inequalities that persist in South Africa ([Zhou & Woodhouse 2018](#); [National Treasury 2020](#)).

Moreover, there appear to be protracted concerns over corruption/favouritism in water and sanitation distribution facilities, pushing the community to adopt public-private agreements. For instance, Participant 3 revealed that '...It's evident that there are long-standing issues of corruption and favoritism in how water and sanitation services are distributed. This situation has pushed the community to consider public-private agreements as a means to address these challenges and ensure fair and transparent access to essential services...'. In the case of Jenikura, Participant A indicated 'You know, we used not to have a water system here. So, when the government was constructing this road, water popped up from one of the pits dug by the

contractor. We depend on water from this pit during the dry seasons, despite knowing the water is not clean, because the only dam in this area is very far away from the community. We drink from the same water source with our animals'. Participant A's statement on the water system in Jenikura points to three key issues concerning the state of water in the community. First, residents travel several kilometres to have access to water from a dam that is not able to meet the water demands of the community during the dry season. Subsequently with the intervention by the government for the main road construction, a gravel pit that was dug through the road construction became a safe haven, increasing the water supply to the community. Though in an earlier submission, Participant A admitted to the unhygienic conditions of the water system available to the community, sadly, there are no alternatives. Worse still, both animals and humans use the same source, a disturbing plight of the community as they are exposed to waterborne diseases. The community's reliance on contaminated water from pits due to the absence of an improved water system highlights the urgent need for infrastructure development and maintenance. The district's medium-term development plans (MDPs) and policies should prioritize the construction and upkeep of safe and sustainable water supply systems, ensuring equitable access to clean water for rural communities. Additionally, the district's bylaws and regulations of the CWSA concerning water quality standards and monitoring need reinforcement to safeguard public health. Community engagement should be prioritized in decision-making processes to ensure that interventions are contextually appropriate and sustainable. Moreover, the CWSA should address the health risks associated with sharing water sources with animals, emphasizing the importance of separating human and animal water sources and promoting hygiene practices. As suggested by [Kumasi *et al.* \(2022\)](#), the advocacy by SDGs for safely managed water sources which means that safely managed water sources are available on the premises, available when needed, and free of any biological and chemical contamination may be far from being reached by rural communities if key policies and legislations like the Ghana Water Policy (GWP) and community participation are not strictly enforced in rural communities.

Unlike the Mpukunyoni community, Participant A confirmed that residents of the Jenikura community had to trek several kilometres to access unhygienic water. However, like Mpukunyoni, though the government constructed boreholes in the Jenikura community, they appear not to be yielding water for use by the community as mentioned during the interview. For instance, Participant A said that 'we have challenges concerning portable drinking water. We don't have enough portable drinking water. The government came and dug 6 boreholes for us but only 1 is currently providing us water. We only on water from a gravel pit which was dug when the contractor was constructing our road. The dugout collects water during the rainy season. Though the water is not hygienic, we have no option. In terms of toilets, we often defecate in the bush, which ends up polluting our dams when it rains. Only a few households have toilet facilities, but because of lack of water, people cannot use flush toilets'. The statement from Participant A highlights the lack of reliable water sources. Despite government efforts, boreholes remain non-functional. The situation in Jenikura is not exceptional as many boreholes in the Savannah area are often unable to yield enough water for households, particularly during dry seasons. With the prolonged drought spells in the area (October–March), boreholes frequently run dry, exacerbating water scarcity challenges in rural communities ([CGDA 2018](#)). Given the scenario of six boreholes with only one functional and serving the residents in the area, there may be an imbalance between the water supply and household population. The functional borehole may be under considerable strain to meet the water needs of the community, potentially resulting in long waiting times and reduced water availability, particularly during peak periods. This situation highlights the urgent need for rehabilitation and maintenance of the non-functional boreholes to increase water supply capacity and ensure equitable access to safe water for all households.

The reliance on water from dugouts indicates the community's desperate need for water, even though water from such sources is not hygienic. The residents rely mostly on open defecation, despite knowing the practice could pollute surface water sources through runoffs. This highlights the stark reality of limited options, and the crucial role water plays in the community's daily life. The reliance on unhygienic water sources from gravel pits due to the absence of functional boreholes highlights the urgent need for infrastructure development and maintenance in rural areas. The CWSA should prioritize the provision of reliable and sustainable water supply systems, ensuring equitable access to safe drinking water for all communities. Additionally, the prevalence of open defecation and limited toilet facilities underscores the need for comprehensive sanitation policies that address both infrastructure and behaviour change. Investments in sanitation infrastructure and hygiene promotion programs are essential to mitigate health risks associated with poor sanitation practices and water contamination. Moreover, regulatory institutions should particularly strengthen the enforcement of the [Water and Sanitation for Health Policy \(2012\)](#). Civil society interventions should aim to integrate water and sanitation interventions, promoting holistic approaches to address the interconnected challenges faced by rural communities. Even though Ghana has made

progress, covering about 80% of urban areas with access to clean water, there is an urgent need to double up similar efforts in rural communities (GSS 2022). This also confirms the UN World Water Development report, indicating a lower percentage coverage of safely managed water supply to rural areas (UN Water 2023). Similarly, Bazaanah (2019) explained the possibility of low water supply status, attributing this to facility maintenance and anthropogenic activities around water sources. Regarding sanitation conditions, Participant F noted that ‘...here domestic waste like garbage is disposed either at the backyard, in the bush or community dumpsites. There are two community toilets, but largely unkept, and poorly maintained’. This statement points to a critical issue concerning waste management and sanitation in the Jenikura community. The indiscriminate disposal of domestic waste, including garbage, in backyards, bushes, and community dumpsites reflects a lack of organized waste disposal systems. The absence of in-house toilet systems puts pressure on the only two communal toilets available, compelling residents to embark on open defecation, a practice which poses significant sanitation challenges for the community. The few community toilets, coupled with their poor upkeep and maintenance, suggests a broader challenge of ensuring basic sanitation infrastructure. This situation not only poses environmental and health hazards due to improper waste disposal but also underscores the need for comprehensive and well-maintained sanitation facilities. It suggests social networks, resources, and capacities for delivering critical social services (McNicholl *et al.* 2017) are critically lacking, requiring attention by duty bearers at the local level.

Compared with the Mpukunyoni community, Participant 3 sheds light on a similar distressing situation, revealing an inequitable distribution of clean water access. Participant 3 said ‘It’s unjust that only a privileged few who are socially connected receive clean and sufficient water deliveries. Meanwhile, the rest of us are left scrambling for whatever remains, often left with insufficient access to meet our basic needs. It’s not fair for the community to suffer from inadequate access to this basic necessity because of favoritism’. The participant underscores a concerning pattern where those with connections to officials in the municipality enjoy preferential treatment, receiving water deliveries to fill up tanks for friends and family. This revelation unveils a disparity in resource distribution, emphasizing that access to essential services is influenced not solely by community needs but by social networks. This reveals potential corruption or favouritism within the water distribution system, exacerbating the challenges faced by vulnerable community members, particularly the elderly. The findings agree with earlier studies that highlight the need to fulfil the human rights to water and sanitation without discrimination (Azfar *et al.* 2018; DWAF 2008). In addition, Participant 4 stressed that ‘As a young man, I am frustrated with the delay of infrastructure caused by individuals. I am also concerned over the issue of a 5 year contract to Counselors who are not giving the necessary services like water and sanitation. The Counselors are ineffective and only interested in enriching themselves, nothing else’. The statement by Participant 4 demonstrates frustrations among the younger demographic, attributing delays in infrastructure development and inadequate water and sanitation services to the ineptitude of Counselors, who seem more focused on enriching themselves than promoting community welfare. This sentiment reflects a broader issue of governance and accountability, where elected officials are perceived as failing to prioritize the essential needs of the community over their own interests. This finding highlights the need for transparent and accountable governance structures that prioritize community well-being and the efficient provision of crucial services. The findings corroborate the decentralization theory which promotes participation and accountability in the provision of water and sanitation services (Azfar *et al.* 2018).

In contrast, however, Participant 5 said, ‘The community is supplied with clean water though it’s not easy, we have a plant that is run by the company called Novubu that is assisting the municipality to provide clean water, we collect water from them and send it to our water reservoir then supply the water to the communities around Mtubatuba Municipality. We have a water supply running through the water pipe system and water trucks for those who do not have water connections. Pipes are enlarged and replaced to those who are damaged as part of maintenance’. Thus, Participant 5 acknowledges the challenges and further highlights a collaboration between a company called Novubu and the municipality to operate a water treatment plant. This partnership has facilitated the supply of clean water to the community, demonstrating a positive aspect of public-private cooperation. This showcases a potential model for sustainable water provision, emphasizing the importance of collaborative efforts involving both public and private entities to address water and sanitation challenges effectively.

In a related study, Pilusa & Kanyane (2020) also found the need for collaborative efforts between government agencies, NGOs, and the private sector for sustainable water and sanitation delivery in South Africa. In addition, Participant 6 said ‘In Mtubatuba we have three water supplies which are the Mpukunyoni water supply skim, the Hluhluwe phase water supply skim, and the third one is Emadwaleni supply skim. We currently have a backlog due to people moving away from the urban areas to rural areas, running away from tariffs. We struggle to meet the demand of water supply and sanitation in the rural areas under Mtubatuba municipality’. The findings disagree with Marx & Charlton (2003) who found water

and sanitation problems are complicated by rural–urban drift. As a point of departure, Participants 7 and 8 acknowledged the need for increased investment in rural water and sanitation facilities to meet increasing demand due to population increase in the community. For instance, Participant 8 stressed that ‘There are no toilet systems for households. Every household is responsible for burning their own garbage. Failing which leads to the areas being dirty as waste would fly around and children and animals get affected by such environment’. Similarly, Participant 7 noted that ‘... with the population growing in our community, there is a pressing need for more investment in rural water and sanitation facilities. Without adequate infrastructure, we risk facing even greater challenges in accessing clean water and managing waste. Our local authorities must prioritize these investments to ensure the health and well-being of our community members’. These concerns highlight a critical issue in Mtubatuba, where a growing backlog in water supply and sanitation services has emerged due to a shift in population from urban to rural areas. The statement also reflects the broader socio-economic dynamics, illustrating how individuals are relocating to rural areas to escape higher tariffs associated with urban living. This migration places strain on existing infrastructure, leading to challenges in meeting the rising demand for water supply and sanitation services in the rural regions under the jurisdiction of the Mtubatuba Municipality. This emphasizes the need for adaptable and comprehensive strategies to address the shifting demographic patterns and associated challenges in sustaining essential services. The findings agree with [Manase *et al.* \(2009\)](#) who found that rural areas of South Africa are facing challenges of low water coverage due to factors including increasing population, investment, and maintenance.

Similar to what pertained to the Mpukunyoni community, the general picture that emerged from the experts’ interviews in the Central Gonja area also pointed to the unavailability of water and sanitation amenities, affecting the health and well-being of residents in the Jenikura area. This view was revealed by Participant B, who indicated that ‘access to clean water and proper sanitation facilities are seriously limited. Some communities rely on wells, boreholes, or rivers for water sources, which do not always guarantee safe and clean water. Sanitation facilities like toilets and refuse dumps are insufficient, resulting in open defecation’. This means the unavailability of facilities impedes access to WASH services, creating a situation where the provision of these essential services is compromised. For Participant C, since there are no toilet systems, the common advice provided by authorities is to use the ‘dig and bury method, where residents are encouraged to defecate and bury their feces’. Similarly, in the FGDs, a participant confirmed that ‘the advice commonly given in such a situation is for residents to utilize the “dig and bury” method for human waste’. This method involved encouraging residents to defecate in designated areas and then burying the faeces to manage waste. It’s a practice adopted when formal sanitation facilities like toilets are absent, aiming to control the disposal of human excreta and minimize health risks. However, it also highlights the urgent need for improved sanitation infrastructure in the area to ensure better hygiene and sanitation practices for the community. Similar studies also found that the unavailability of facilities affects people’s access to clean water and proper toilet systems and increases the risk of waterborne diseases, including diarrhoea, cholera, and typhoid ([Pal *et al.* 2018](#); [Fazal-ur-Rehman 2019](#); [Kanyagui & Viswanathan 2022](#)).

Furthermore, the account by Participant 9 provides a poignant perspective on the daily struggle for clean water in the Mpukunyoni area. Participant 9 said that ‘I collect water from the nearest water tank allocated to us by the municipality (or by the river side) every day after school as I am living with my grandmother who cannot collect water during the day when I am at school. This is a daily exercise for me and my grandmother to have clean drinking water everyday’. A related trend emerged among residents in the Jenikura area. Interviews with experts from the area appear to show a heavy reliance on surface water like rivers, lakes, and dams for both domestic and agricultural purposes. Participant J averred that ‘Sadly, our drinking sources are also commonly shared with domestic animals and wildlife’, while Participant Y said that ‘the burden of water collection heavily falls on women and female children, who often have to trek for 20–45 minutes to fetch water’. From the FGDs, Participant K revealed that ‘women are traditionally carved out for household duties, involving fetching water and cleaning. Worthy households rely on donkeys, motorcycles, and bicycles, while poor households often trek to the water sources’. For both the Mpukunyoni and Jenikura areas, the participants described the routine of collecting water from different sources, highlighting the dedication required to secure this fundamental resource. The practice of sharing drinking sources with animals raises concerns about the quality and safety of the water due to potential contamination from animal waste or other pollutants. The findings underscore the individual hardships faced by community members, particularly those living with limitations such as attending school during the day. This shows the human impact of water and sanitation, emphasizing the resilience and determination required by individuals to ensure access to clean drinking water, shedding light on the human stories behind the broader infrastructure challenges. It also shows that the routine of water collection can negatively impact a girl child’s academic performance. Additionally, girls and adult females face a significant challenge in maintaining

cleanliness, especially during their monthly periods, as access to water is crucial for personal hygiene. This can result in some young girls skipping school on certain days to avoid feeling embarrassed due to the lack of proper facilities. These findings confirm an earlier study by [Osiero *et al.* \(2019\)](#) who found that water-related diseases claim lives due to poor personal hygiene. Similarly, Participant 10 provided an account of the harsh reality faced by residents in deep rural areas by saying ‘At my home, I am the only one who can collect water from the river as we are living in a very deep rural area. My father passed away I live with my 2 younger sisters and my mother who has health issues. We live on a grant. We cannot afford to buy water, so the option is to use the water from the river for a living’. As the sole provider of water for the family, the statement from Participant 10 detailed the challenges of collecting water from river sources due to financial constraints and the absence of alternative options. Additionally, it indicates that due to the inability to afford high-quality water, residents are compelled to resort to using rivers for domestic water purposes, despite the associated risks of exposure to waterborne infections. This finding underscores the stark choices individuals in marginalized communities face concerning water access and the limitations imposed by economic factors. The result highlights the urgent need for targeted interventions to ensure that vulnerable populations in deep rural areas have reliable access to clean water, addressing both infrastructure gaps and economic disparities. In a related study, [Baker-Austin *et al.* \(2018\)](#) found that low household incomes affect access to service delivery, compelling rural residents to rely on unimproved water sources like rivers.

4.2. Obstacles to water and sanitation service delivery

This section analyses the challenges preventing the efficient provision of water and sanitation services, including infrastructural and institutional limitations. The results showed that the participants had varied opinions. For instance, Participant 1 said that ‘Based on friend and family members who are related to those employed in the municipality, community members don’t get water or if they get supplied with water it would be very limited litres of water. Some areas don’t even get such services’. The remarks from Participant 1 underscore a concerning reality within the municipality where community members, despite having connections to municipal employees, still face challenges in accessing an adequate water supply. The revelation that some areas receive either limited water or no service at all raises questions about the effectiveness and equity of the water distribution system. This finding highlights potential disparities and a need for more inclusive and comprehensive water delivery policies and strategies that ensure all community members have reliable access to this essential resource. The finding affirms critics’ observation of weak enforcement of the WSA which seeks to ensure equity in water supply for South Africans ([Loucks & Van Beek 2017](#); [McGahey 2022](#)). Furthermore, Participant 2 indicated that ‘Rural areas do not have structured plans for the houses or the streets, which I believe could be the other obstacle that would lead to other community members not receiving the service of water and sanitation in the areas of Mpukunyoni, because there are no proper roads for water trucks to get to those areas’. The observation by Participant 2 shed light on the interconnected nature of infrastructure and service provision. The absence of structured plans for housing and streets in rural areas presents a significant obstacle to water and sanitation delivery. The participant rightly points out that the lack of proper roads impedes the ability of water trucks to reach certain areas, exacerbating the challenges faced by those communities. This finding emphasizes the crucial link between urban planning and the accessibility of basic services, urging a holistic approach to development that considers both housing infrastructure and essential service delivery. The findings agree with [Wright \(2018\)](#) who argues that the strain on the already under-resourced water and sanitation infrastructure is a significant issue. Moreover, Participant 3 observed that ‘people in leadership have made changes but very slowly in this area of water and sanitation. I think they don’t take this as a priority because most people in rural areas buy water for themselves. Most of them use the grant money to get access to clean water’. The perspective shared by Participant 3 draws attention to the pace of change in leadership decisions related to water and sanitation. The acknowledgment that changes have been slow suggests potential bureaucratic hurdles or a lack of prioritization for these crucial services. Furthermore, the insight that people in rural areas often resort to buying water using grant money indicates a gap in the provision of clean water, leading communities to self-finance their access. This result underscores the need for more proactive leadership engagement, increased prioritization of water and sanitation issues, and targeted interventions in the municipal IDPs to accelerate improvements in these essential services for the community. The result affirms earlier studies which found the water situation in South Africa to be a leadership and governance problem ([DWAf 2017](#); [Azfar *et al.* 2018](#); [Ngema 2022](#)).

In the Jenikura community, however, the situation is rather different as most people living in the community are low-income earners and thus cannot afford to buy water from vendors in the district. Hence, they look up to the government through the District Assembly to provide such basic social amenities as water and sanitation facilities, including their

maintenance. Participant A confirmed that though ‘...assembly will bring that initiative, but when it comes to maintenance and other basic needs, the assembly is nothing to talk about. Our request to the Assembly falls on deaf ears...’. Participant A confirms this concern, further stating that ‘we have made several appeals for toilet facilities. Even common brooms that are used to sweep dirt, we don’t have’. Thus, the Assembly and the resident’s inability to afford the maintenance cost of facilities results in inadequate upkeep and breakdown of water and sanitation facilities, thereby limiting residents’ access to essential WASH services. The decentralized structures and the Assembly’s Medium Term Development (MTD) plan for asset management should take these difficulties into account as well as the complexity of the services being offered (Burr *et al.* 2013). The Assembly must prioritize community-focused initiatives and establish relationships with stakeholders to ensure residents’ health is not negatively impacted by the current situation. According to McNicholl *et al.* (2017), it is essential to understand institutional development conditions from the perspective of an enabling environment that promotes positive transformation.

Again, the participants expressed concerns over systemic issues including accountability, management, and leadership obstacles, suggesting that a lack of a structured job list and monitoring mechanism contributes to the persistent challenges in the community. This was highlighted by Participant 4 who said that ‘If the people in leadership could have a job list of things that need to be done for the community and be monitored this could be eliminated. Lack of accountability and management in the reason that post 20 years of apartheid we still experience the same problem’. Thus, Participant 4 appears to link persistent systemic deficiency to the enduring problems two decades post-apartheid, emphasizing the need for transparent and effective governance. The call for accountability highlights the importance of implementing mechanisms of the IDP, the FBW, and the WSA that ensure leaders are held responsible for delivering essential services, contributing to a more responsive and efficient administration that addresses the long-standing issues of water and sanitation facing the community. This confirms studies that suggest the need for the South African government to work towards creating a regulatory environment that promotes accountability and transparency in water and sanitation management (Muller 2018; Zhou & Woodhouse 2018).

Similarly, Participant 5 indicated that ‘There is a commonly caused obstacle including load shedding because the pumps are not functional when we don’t have electricity. Electricity outage is the reason that some of the valves get damaged and need continuous repairing or replacement which has cost implications at time and delay in service delivery’. Thus, Participant 5 draws attention to a specific and immediate obstacle – load shedding – that directly affects the functionality of water pumps due to electricity outages. The participant established a clear cause-and-effect relationship, indicating that infrastructure challenges are compounded by external factors like power disruptions. This finding emphasized the interconnected nature of essential services and underscored the importance of addressing not only internal infrastructure issues but also external factors like electricity supply that may impact service delivery, highlighting the need for comprehensive and resilient systems that can withstand external pressures. Similar to this study, the DWAF (2017) also found that there is a need to empower communities, so that residents can be active participants in maintaining and protecting their water and sanitation infrastructure.

Related to this, Participant 6 added that ‘The fact that people move from urban areas to rural areas leads to meeting the demands because the infrastructure was structured to meet a certain number of populations, now we have to re-plan to satisfy the needs of the people. We have water tanks that assemble in a reachable place for the community however because of vandalism they get damaged and fixing them becomes a challenge due to budget constraints’. The statement from Participant 6 adds another layer to the complexity of the issue by highlighting the demographic shift from urban to rural areas and its implications for infrastructure planning. The participant notes that the existing infrastructure was designed for a specific population, and the influx of people requires a re-evaluation of planning strategies. Vandalism of water tanks becomes a challenge, affecting both accessibility and budget constraints. This finding underscores the dynamic nature of communities and the necessity for adaptive infrastructure planning that considers population shifts and safeguards against potential damages, calling for innovative and sustainable solutions. For scholars like Gwala (2018), this is critical because where there is a lack of government support and funding, decentralization efforts may struggle to secure the necessary resources to provide adequate water and sanitation services.

Furthermore, Participant 7 underscores a critical disconnect between the promises made by municipal leaders during electoral campaigns and their subsequent responsiveness to community needs. Participant 7 said that ‘I don’t know exactly why the municipality failed to provide us with necessary needs because when it is time to vote they do come and be able to come and request for votes but when it’s time for rendering services, the same people who came looking for a vote are not reachable’. The participant expressed frustration over the apparent inconsistency between the accessibility of officials during election periods and their lack of engagement when it comes to delivering essential services. This finding highlighted a

significant issue of accountability and transparency within the political system, where elected representatives may prioritize electoral gains over sustained service delivery. It emphasized the need for more sustained and genuine engagement between the municipality and the community, urging for a shift towards consistent, responsive governance that extends beyond election cycles to ensure that community needs are prioritized and addressed in an ongoing manner. An earlier study by Ngema (2022) also found that political stability and governance structures can play a crucial role in determining the effectiveness of water and sanitation services.

Moreover, it appears that the participants are concerned about the interplay between social dynamics, infrastructure, and access to water and sanitation services in the communities. For instance, Participant 8 revealed that ‘It’s so unfortunate that we live in a time when people only care for themselves. No matter how difficult it may be to access water you cannot get help from the neighbours because they also experience the same thing. I believe that if proper roads can be constructed we would be able to get the help we need with regards to water and sanitation’. Participant 8’s statement reflects a sense of disillusionment with the current state of water and sanitation access in their community, attributing the lack of assistance from neighbours to a broader societal trend of individualism. They express a belief that improving road infrastructure could facilitate access to assistance with water and sanitation challenges. This perspective highlights the interconnectedness of various infrastructural and social factors in addressing water and sanitation issues. In connection with South Africa’s FBW policy, and the IDP, this statement underscores the importance of holistic approaches to water and sanitation management that consider not only infrastructure but also social dynamics and community engagement. The FBW policy should prioritize investments in both physical infrastructure, such as roads and water supply systems, and social programmes that foster community solidarity and cooperation. Additionally, there may be a need to enforce legislation like the WSA and IDP that addresses systemic issues contributing to individualism and promotes collective action for water and sanitation improvements. In aligning these policies and legislative initiatives with the realities and needs of communities, South African municipalities can work towards achieving equitable access to water and sanitation for all its citizens. Similar studies also stressed the importance of investments, engagement and participation as critical steps for improving water and sanitation services (DWAF 2017; Azfar *et al.* 2018; DWS 2019; Gwala 2022).

Another critical obstacle identified by Participant 9 was theft associated with pipelines, indicating that ‘The pipes that get stolen most of the time affect the supply of water to those areas which get such services. Copper pipes are targeted and get stolen now and again in most of the households and thousands of litres of water would go to waste because of the leaks caused by stolen pipes’. This statement is a critical issue in water infrastructure security, with the theft of copper pipes notably disrupting the supply of water to affected areas. The targeted theft not only disrupts the water flow but also results in substantial wastage due to leaks. This finding underscores the direct impact of criminal activities on essential services, demonstrating that the theft of pipes not only deprives communities of reliable water access but also contributes to significant water loss. This issue could extend beyond the immediate inconvenience to communities; it points to the need for increased security measures, community awareness, and potentially innovative solutions to safeguard water infrastructure, ensuring the sustainability and efficiency of water supply systems in the face of criminal disruptions. This confirms the DWAF’s (2017) view on the need to address water losses and security in order to achieve the FBW policy in rural areas of South Africa.

Closely related to this idea, Participant 10 specifically stressed the issue of maintenance of sanitation facilities, saying that ‘lack of maintenance of the infrastructure leads to a poor environment, causing ill-health and death. Runoff water carries dirt into our rivers and when we drink from them, it causes disease outbreaks’. The participant underscores the critical role that maintenance plays in preventing a degraded environment, which, if neglected, can result in severe health consequences, including illness and mortality. The statement draws attention to the downstream effects of poor sanitation infrastructure on water sources, emphasizing that runoff water-carrying contaminants can lead to disease outbreaks when consumed. This perspective underscores the broader effect of infrastructure neglect, emphasizing that the consequences extend beyond the physical state of facilities to encompass public health and the overall quality of life for communities. It reinforces the urgency of prioritizing and investing in the maintenance of sanitation infrastructure to ensure the well-being of the population and the environmental sustainability of water sources. In a related study, Zhou & Woodhouse (2018) found that lack of maintenance of infrastructure affects water and sanitation access, reflecting the broader socio-economic inequalities that persist in South Africa.

4.3. Strategies to address water and sanitation challenges at Jenikura and Mpukunyoni

This section provides insights for stakeholders to inform interventions, policies, and strategies to overcome existing obstacles and improve equitable water and sanitation access for households and individuals facing enduring service delivery issues. To

improve water and sanitation systems in rural areas, it is necessary to comprehend the geographical conditions that predominate in these communities and combine the various elements of sustainability, be it social, economic, political, environmental, or others (Bazaanah & Mothapo 2023). The participants offered diverse suggestions to address the existing water and sanitation conditions. In the view of Participant 1, 'I suggest that all water trucks should have forms of free water that they are responsible for delivering to the community. These forms are to be filled up every time the water is supplied and be filled at the office for checking through the war rooms if all households get access to clean water'. This statement attests that Participant 1 suggests the introduction of a practical and accountable approach to addressing water supply issues, proposing that water trucks should carry forms for free water distribution to the community. The participant emphasized a transparent system where these forms are filled each time water is supplied and subsequently filled at the office. This proposal not only ensures a record of water distribution but also suggests a mechanism for regular monitoring through established channels like what is termed 'war rooms'. This strategy has the potential to enhance accountability, transparency, and systematic oversight in water distribution. Implementing such a process could not only track the equitable distribution of clean water but also empower communities to hold authorities accountable for ensuring that every household has access to this vital resource, addressing concerns about fairness and efficiency in the water delivery system. Similarly, a study by Jones (2013) revealed that improved oversight, transparent decision-making processes, and efficient resource allocation can enhance the effectiveness of service delivery.

Moreover, Participant 2 also said that 'The first thing that should be addressed is how these services are going to reach the rural areas if roads are not structured. My suggestion is that the municipality find a way to contract proper roads even if they are gravel roads, just to make it easy to deliver these services to the communities'. The participant revealed that addressing the lack of structured roads should be a priority, as it directly impacts the accessibility of essential services. The suggestion to consider contracting proper roads, even if they are gravelled, highlights a pragmatic approach to overcoming logistical challenges. This finding is significant as it sheds light on a fundamental barrier – *poor infrastructure* – that hinders service extension to rural communities. Implementing this suggestion could not only improve the efficiency of service delivery but also enhance the overall connectivity and accessibility of remote areas, contributing to a more equitable distribution of essential services and potentially fostering broader development in these communities. In a related study, Wright (2018) and the Department of Water and Sanitation (2019) found that addressing critical infrastructural needs is an important step and demonstrates South Africa's commitment to addressing historical injustices and enhancing living conditions.

Another practical and community-centric solution was suggested by Participant 3 who stressed that 'boreholes are a solution. In most areas, we do have them but they are no longer functional. The municipality should service such areas to make sure that all people have access to clean water. For sanitation, yes in rural areas we use pit toilets, but it's painful to see other people going to the neighbours to use the toilet or opting for the bushes just because the municipality has failed to render the service. War rooms should work in a fair way and do proper surveys that will benefit all community members'. The participant not only suggests the use of water and sanitation amenities but also emphasizes the importance of servicing existing boreholes to ensure functionality. The finding placed emphasis on decentralized and community-specific solutions to water and sanitation access issues. Additionally, the participant's concern about the functionality of existing boreholes and the need for proper sanitation services reflects the immediate effects of these services on individuals' daily lives. The call for fair and comprehensive surveys by war rooms underscores the importance of inclusive and data-driven decision-making to address the diverse needs of all community members. This suggestion carries the potential to not only improve water and sanitation services but also empower communities to actively participate in and benefit from the decision-making processes regarding their essential services. The findings confirm the perspectives of decentralization advocates (Azfar *et al.* 2018; Walter 2021), who argue for the transfer of decision-making authority from central governments to lower levels of governance, aiming to enhance service delivery. Related to this idea, Participant 4 reiterates the centrality of waste management and the need to avoid open defecation and indiscriminate dumping of solid waste. Participant 4 said that 'to prevent people from dumping their dirt everywhere, I propose that the municipality should have one of those big bins to encourage people to dump dirt in one central area because by not doing that we will forever have a problem with diseases that could be avoided'. Thus, by proposing the implementation of central bins to discourage indiscriminate dumping, the participant recognizes the urgent need to control the spread of diseases linked to improper waste disposal. This finding advocates for a practical and community-oriented solution to a pervasive issue. The proposal aligns with the broader goal of promoting a cleaner environment and mitigating health risks associated with uncontrolled waste disposal. Implementing centralized bins not only fosters a more organized waste management system but also encourages a collective

responsibility for maintaining a hygienic living environment, reflecting a proactive approach to community health and well-being. In a related study, [Zhou & Woodhouse \(2018\)](#) advocate for the implementation of the FBW policy as a measure to improve the management of waste in South Africa.

Similar sentiments were suggested by Participant 5 who said ‘we have septic tanks and surge in areas that are for those which use flushable toilets. For those using pit toilets the municipality make means for every house hold to at least have one toilet. It is true that we have not managed to reach all households but good efforts are being made because most of the rural homes have toilets. We have a huge challenge of the source of supply because Mtubatuba Municipality depends on the Umfolozi River for water supply. This means if we don’t have enough rain that could lead to water shortage. I do recommend that the municipality enlarge the Umfolozi River or the water reservoirs so we can avoid a situation of running out of water supply’. The insights from Participant 5 provide a comprehensive view of both successes and challenges in sanitation and water supply. Acknowledging efforts made to provide toilets, the participant also highlights the persistent challenge of reaching all households, emphasizing the need for continued improvements. The participant draws attention to a critical issue – the municipality’s reliance on the Umfolozi River for water supply and the vulnerability to shortages during periods of insufficient rainfall. The recommendation to enlarge the river or reservoirs signifies a forward-thinking approach to ensure a more resilient water supply system. This finding not only underscores the ongoing commitment to expanding sanitation facilities but also addresses a potential vulnerability in the water supply infrastructure, offering a proactive solution to mitigate the impact of climatic variability on community water access. The findings agree with [Sinha \(2021\)](#) who found that investing in water and sanitation facilities, capacity-building and training programmes for local professionals in water and sanitation management is vital.

Moreover, Participant 6 also revealed the need for continued coordinated efforts by the municipality to address water and sanitation needs within the community. The participant argued that ‘We have a schedule that is communicated to the community to take out their containers and the water trucks visit the households and fill up their containers while awaiting to fix the water tankers that are damaged due to vandalism. The Municipality is supporting the households to build their toilets but a certain percentage is assisted with pit toilets. As for the flushable ones, people organize for themselves. But when there are blockages, then the municipality would assist’. The communicated schedule for water truck visits demonstrates a proactive approach to ensure regular water access for households. The participant also highlighted the unfortunate issue of water tankers being damaged due to vandalism, underscoring the challenges faced in maintaining service infrastructure. The municipality’s support for toilet construction, particularly aiding with pit toilets for a percentage of households, indicates an inclusive approach to sanitation improvement. Additionally, the participant noted the community’s self-organization for flushable toilets and the municipality’s assistance in cases of blockages, reflecting a collaborative relationship between the local government and the residents. This finding signified a multifaceted strategy involving scheduled water delivery, infrastructure support, and community engagement, showcasing the need for community-driven approaches to address water and sanitation challenges. In a similar study, the [DWAF \(2017\)](#) and the [Department of Water and Sanitation \(2019\)](#) argued that the WSA establishes the need for decentralized governance structures for water services involving collaboration between national, provincial, and local authorities. Related to this, Participant 7 advocated the need for adequate water access to safeguard public health, especially among women and children. Participant 6 said that ‘I would say the municipality should find ways to provide us with water to protect us from diseases that can affect us due to lack of necessary services’. This statement draws the municipality’s attention to the need to extend initiatives [like bulk water supply to schools] to the broader community. The finding highlights the potential vulnerability of students and the broader population to water-related diseases due to inadequate services. The participant’s recommendation signals the need for the municipality to prioritize and implement strategies to ensure consistent water access outside educational institutions, emphasizing the critical role of clean water in protecting communities from preventable health risks. It also reflects a broader societal concern for equitable access to essential services, with a particular focus on vulnerable populations such as students. A related study by [Weststrate et al. \(2019\)](#) also discovered that access to clean drinking water and proper sanitation facilities is a basic human right that should be accessed by all.

A similar sentiment was shared by Participant 8 who stressed the critical role played by the tribal authority in facilitating access to clean drinking water for the community ‘The tribal authority is the one that assists in getting access to clean drinking water. They often would have a meeting with the community and address this issue and manage to get water tanks to bring water to us. The only problem is that this happens once a month then if water gets finished, we have to go back to the river and fetch water’. The participant highlights a structured approach wherein the tribal authority conducts meetings with the

community to address water-related concerns and arranges for water tanks to deliver water. However, the participant points out a critical limitation – the periodicity of this assistance, which occurs once a month. The reliance on the river for water needs when the supply is exhausted reflects the intermittent nature of water availability and accessibility. These findings demonstrate the importance of local leadership in bridging gaps in water access but also underscore the need for more consistent and reliable solutions. It highlights communal efforts to address water challenges but suggests the necessity for sustained and frequent interventions to ensure continuous access to clean water, emphasizing the importance of developing long-term and reliable water supply mechanisms. The findings give credence to advocates for decentralization of water and sanitation service delivery, stressing the urgency for inclusive planning and development (Wright 2018; Walter 2021).

Similar to what occurred in Mpukunyoni, efforts were made by the elders and local authorities of Jenikura to enforce by-laws and customary practices to safeguard water bodies. For instance, Participant A stressed that ‘we were having a dam which was used to dry out during the dry season due to pollution. So it came to a time I had to patrol the dam site to ensure that no woman or child stepped inside the water barefooted. So we kept some stones up to the water level so people can step on the stones before they fetch the water. If you mistakenly walk inside the water then that day you will not get water. This practice avoided pollution arising from human use’. These findings corroborate Issaka *et al.* (2015) who observed that the CGD has a terrible condition with water supplies, and it is believed that this shortage is a major contributing factor to the region’s poverty and water-related illnesses.

For Participant 9, there is the need to expand consultation and engagement processes by involving young people in ‘war room committees’ for effective management of water and sanitation issues in Mpukunyoni. Specifically, Participant 9 stressed that ‘most war room committees should have young people dominating. This is to get fresh views and ideas and also to easily reach out to the community. Young people are quicker, energetic, and easy to reach and respond to awareness and advocacy messages. I recommend the Counsellors and the tribal house should take advantage of the youth and intensify public education and awareness campaigns on water and sanitation issues’. Similar sentiments were shared by the FGD participants and expert interviews in the Jenikura community, who generally advocated for the inclusion of young people in deliberations at the local committee levels. Participant Z for instance mentioned ‘the vitality, fresh perspectives and energy that the youth brings to awareness and advocacy efforts in the Jenikura area’. Again, Participant K also indicated that ‘youth groups could volunteer to serve as watchdog/security or raise awareness on water systems, ensuring compliance while applying sanctions to serve as deterrent to people polluting the drinking sources through open defecation’. These findings underscore the unique attributes of the youth – their responsiveness, energy, and ease-of-reach – that can enhance the impact of public awareness and education campaigns. The participant’s recommendation serves as a call to action for local authorities, suggesting that counselors and leaders leverage the strengths of the youth to intensify efforts in educating and creating awareness about water and sanitation issues within the communities, emphasizing the role of youth empowerment in promoting positive change. Similarly, studies by Zhou & Woodhouse (2018) and Wright (2018) also stressed the critical need for educational campaigns to raise awareness about the importance of sanitation practices and the sustainable use of water resources.

Again, Participant 10 added that ‘planning should be more inclusive and should reflect the needs of the different population segments. Also, the municipality should create a budget for water supply and sanitation to the rural. The municipality could explore alternative energy sources like solar overdependence on the erratic electricity for pumping water’. Similar perspectives were shared by Participants X and D from the Jenikura area. Participant X suggested the need for ‘...decision structures to be more open and inclusive’. In re-echoing this viewpoint, Participant D said that ‘we need all residents onboard. Capacities of decentralised decision structures should be increased and sufficient budgets should be allocated for construction and rehabilitation of our water and sanitation systems. We cannot continue to defecate in the open’.

In stressing the importance of creating a budget specifically earmarked for water supply and sanitation in rural areas, Participants 10 and X thus called for a targeted and focused financial commitment and build-capacity of decentralized decision structures to address the critical needs. The suggestion to explore alternative energy sources, such as solar power, recognizes the vulnerability posed by the erratic electricity supply for water pumping. This underscores the importance of tailored planning and budgeting to ensure equitable access to water and sanitation services, particularly in the communities. It also suggests a forward-thinking approach by advocating for sustainable energy solutions, reflecting a holistic view that considers both immediate needs and long-term environmental sustainability in addressing water and sanitation challenges. The findings corroborate Gwala (2018), who stressed that where there is a lack of government support and funding, decentralized structures may struggle to secure the necessary resources to provide adequate water and sanitation services.

5. CONCLUSIONS AND POLICY RECOMMENDATIONS

The study evaluated access to drinking water and sanitation services in the Jenikura and Mpukunyoni areas. Framed from the decentralization and HRB perspectives, and using qualitative research methods, the study illuminates the pressing and multifaceted challenges faced by the residents of both communities. The results underscored the gravity of the water and sanitation situation, revealing chronic deficiencies that have persisted over an extended period. The participants' varied opinions and experiences painted a vivid picture of the individual struggles, emphasizing the indispensable role of clean water for daily life and overall well-being. There is an urgency to address water and sanitation challenges in the communities. The chronic lack of clean water and sanitation services is a pervasive issue, affecting various aspects of the daily life of members in the communities. An important revelation that emerged from the study hinged on the inherent accountability and responsibility of the local governance structures that fosters delivery of essential services to the benefit of the rural community. This underscored the willingness to be involved in development priorities in the rural communities and subsequent ownership of such initiatives of the government through the local/district assembly. The local structure of governance must be strengthened to advance water and sanitation systems in the rural communities. The participant's testimonies underscored the urgent need for intervention, emphasizing that access to clean water is not merely a governance issue but a fundamental necessity for sustaining life and maintaining human dignity. An important revelation from the study is the presence of corruption and favouritism in water distribution, highlighting a deeply rooted issue within the community's governance structures. The preferential treatment of individuals in the Mpukunyoni area reveals systemic challenges that impede equitable access to essential services. This underscores the importance of addressing governance issues alongside infrastructure improvements as sustainable solutions. The frustration expressed by participants, particularly the younger demographic, towards elected officials prioritizing individual interests over community welfare points to a broader crisis of leadership and accountability. The findings emphasized the need for transparent and accountable governance structures that prioritize the essential needs of the residents over the interests of a selected few. Without responsive leadership, the enduring problems in water and sanitation services are likely to persist. On a positive note, the study highlighted successful public-private partnerships as exemplified by the collaboration between Novubu and the municipality to operate a water treatment plant. This case provides a potential model for sustainable water provision, showcasing the effectiveness of collaborative efforts between public and private entities. It suggests that such partnerships can play a pivotal role in addressing water and sanitation challenges, potentially serving as a blueprint for other communities facing similar issues. The study also shed light on the broader socio-economic dynamics at play, such as population shifts from urban to rural areas, which strain existing infrastructure and contribute to challenges in meeting the rising demand for water supply and sanitation services. This emphasized the need for adaptable and comprehensive strategies that consider shifting demographic patterns and associated challenges in sustaining essential services. Furthermore, the study emphasized the human impact of water and sanitation challenges, particularly on vulnerable groups such as girls facing difficulties during menstruation. The perspectives shared by participants underscored the importance of addressing not only infrastructure deficiencies but also the broader societal implications, such as the impact on education and public health. The study calls for a multifaceted approach, including transparent governance, community-driven initiatives, and targeted interventions to ensure equitable access to clean water and sanitation services. We suggest that duty bearers (like state departments, district assemblies, municipalities, NGOs, Civil Society Organizations, etc.) in both communities could:

1. Implement transparent monitoring systems for water distribution as a crucial step towards enhancing accountability and ensuring equitable access to water as a vital resource. This approach, reminiscent of the 'war room' strategy used by the Mpukunyoni community, could serve a dual purpose of (i) creating a comprehensive record of water distribution and establishing a mechanism for regular monitoring and oversight and (ii) empowering communities by providing them with the tools to hold authorities accountable for ensuring that every household has fair and efficient access to clean water.
2. Prioritize road infrastructure in rural areas, particularly focusing on improving accessibility for essential services such as water and sanitation. This investment in road infrastructure would not only enhance the efficiency of service delivery but also contribute to the overall connectivity and accessibility of remote areas. Ultimately, it could foster a more equitable distribution of essential services, thereby contributing to broader community development. Moreover, road infrastructure development provided means for the creation of a more sustainable water system as revealed in the Ghana case.
3. Actively involve young people in decision-making processes, specifically within the local committees by widening the consultation and community engagement process on water and sanitation issues. This strategy would not only empower the

youth but also foster a sense of ownership and responsibility within the communities, paving the way for sustained improvements in water and sanitation services. Making deliberate efforts to involve women in the decision-making process due to the role they play in accessing water and sanitation systems for households cannot be overlooked in the communities.

ETHICS STATEMENT

We hereby confirm that this study complies with the requirements of ethical approvals from the institutional ethics committee of the CSIR-Water Research Institute and the Management College of South Africa regarding the conduct of this research.

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DATA AVAILABILITY STATEMENT

Data is available for access upon reasonable request.

CONFLICT OF INTEREST

The authors declare there is no conflict.

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