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What is there to drink? Water (in)justice in the democratic South Africa

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Introduction: Aligned to Chapter 2 of the Constitution of the Republic of South Africa which recognizes water to be a basic human right, the democratic government from 1994 adopted policies, legislation and programmes that encourage universal access to basic water services. Although some progress has been made in urban areas concerning access to potable water supply, South Africa still faces serious problems in providing basic water services in rural areas. This study aims to understand sources of drinking water, how water is accessed by local communities, and determine the barriers associated with access to potable water and management in the rural villages of Madiba and Enqabeni.

Data collection: To fulfil the aim of this study, semi-structured interviews, interviewer-administered questionnaires, and field observations were employed as data collection tools. Data obtained from interviews were analyzed using thematic content analysis, while the questionnaires were assessed using Statistical Package for Social Sciences.

Results and Discussion: The study found that the majority of people still rely on untreated water from open water bodies. The study also identified corruption, and infrastructural and institutional problems as barriers affecting water service delivery to communities. These institutional problems mean that water resource management and access are unfair, inequitable and unjust, and constitute water injustice. The basic human right of access to water by communities is thereby violated and this has devastating effects on the lives and livelihoods of community members. Despite democracy, the legacy of apartheid's unequal water policy is still influencing water services and South Africa remains far from achieving Sustainable Development Goal 6.

KEYWORDS

democratic government, human rights, rural areas, South Africa, untreated water, water injustice

Introduction

Potable water is vital for human health and survival, and access to clean and safe drinking water for all citizens is a universal human right. This is in line with United Nation's Sustainable Development Goals (SDGs), particularly SDG 6, which calls for the provision of water and sanitation services to citizens (Ortigara et al., 2018; United Nations, 2018). Although at the global scale from 2002 to 2020 there was improved access to safely managed drinking water (WHO/UNICEF, 2021), in 2023 there were still 2 billion people around the globe who did not have access to safely managed drinking water services (Target 6.1). This includes 771 million who were without even basic drinking water (United Nations, 2021; WHO/UNICEF, 2021). The sub-Saharan Africa is the region with the highest number of people without access to basic drinking water services. As of 2020, about half of the global population without basic drinking water services, (that is, about 387 million people)

lived in sub-Saharan Africa (WHO/UNICEF, 2021). The majority of these people rely on untreated water from open water bodies that include rivers, streams, springs, lakes and wetlands (Asaba et al., 2013; Okello et al., 2019).

As documented by many scholars, untreated water from open water bodies is not safe for human consumption (de Magny et al., 2011; Dan-Nwafor et al., 2019; Osiemo et al., 2019; Bwire et al., 2020) because these serve as the sinks for discharged domestic and industrial waste (Edokpayi et al., 2017). Reliance on untreated or contaminated water not only has devastating effects on human wellbeing and livelihoods, but also puts communities at risk of contracting cholera, dysentery, typhoid and polio (Kwesiga et al., 2018; Okello et al., 2019). According to a joint report published in 2021 by the WHO and UNICEF, the current coverage of people who have access to basic water services in sub-Saharan Africa is estimated at 64% compared to 90% of inhabitants in other regions. Thus, compared to other regions, sub-Saharan Africa is lagging in water access. More specifically, compared with urban dwellers in sub-Saharan Africa, rural people have far more limited access to clean water (Adams et al., 2019; Grasham et al., 2019). According to estimates, 16% (that is, 1.8 billion people) of the world's population live in households collecting either improved or unimproved water from sources situated outside their premises (Graham et al., 2016; WHO/UNICEF, 2023). For instance, in sub-Saharan Africa where many communities do not have potable water supplies piped into their homes, nearly half of the population (that is 45% of 1.2 billion) people still rely on water collection outside their homes and women and girls are four times as likely as men and boys to fetch water (WHO/UNICEF, 2023).

In South Africa, poor service delivery (including limited access to potable water) has a long history that dates back to colonial times and the apartheid era. Under the apartheid regime, policies of the government were designed to empower the white minority at the expense of the black majority (Jegede and Shikwambane, 2021). As Jegede and Shikwambane (2021) have noted, under the apartheid government, there was "water apartheid" where the wealthy white minority was supplied with water whereas underprivileged black populations in so-called homelands (Bantustans) were largely left to deal with and suffer from the lack of access to clean water. At the end of apartheid in 1994, it was estimated that 14 million people (35% of the population) in South Africa lacked basic water supply services (Department of Water Affairs Forestry, 2004). The transition to democracy in 1994 also meant the development of a new constitution inclusive of the people of South Africa. The right of access to basic water services was enshrined in the Constitution of the Republic of South Africa (the Constitution). Section 27(1) (b) of Chapter 2 of the Constitution provides that "everyone has the right to have access to sufficient food and water" (South Africa, 1996). Thus, the Constitution recognizes that water is a basic human right.

After 1994, the government adopted policies, legislation and programmes that encouraged universal access to basic water services for all South Africans. This not only improved the quantity and the quality of water supply to citizens but importantly, after a decade of democracy in 2004, an additional 13.4 million people had access to basic water supply services (Department of Water Affairs Forestry, 2004). Recent report by Department of Water Sanitation (2018) showed that only 64% of households had access to a reliable water supply service. Although (in urban areas) some progress has been made regarding access to basic water supply, South Africa still faces serious problems in providing household water services, particularly in rural areas. Literature suggests that research on household water insecurity (which constitute water injustice) has been done all over the world (Jepson et al., 2017). In the context of South Africa, previous studies have addressed issues of water insecurity and lack of municipal water services, particularly in rural communities of Limpopo and KwaZulu-Natal Provinces. For instance, in Limpopo, Bulled (2017) examined the relationship between water insecurity, emotional distress and civic engagement in order to improve access to water services in Vhembe District. Similarly, Murei et al. (2022) investigated the barriers to water and sanitation safety plans whereas Malima et al. (2022) studied the challenges and coping methods of potable water supply systems in the rural communities of the Vhembe District Municipality. In KwaZulu-Natal, using the paradigm of basic human needs, Kheswa (2019) studied the social impacts of water scarcity on rural communities of the Mkhambathini municipality. Similarly, Lebek et al. (2021) examines the implications of unequal levels of household water insecurity, the effects on their health and productivity and on their power relations with other households among rural communities. In addition, Patrick (2021) assessed the coping mechanism for climate change-induced water scarcity in uMkhanyakude District Municipality. In other provinces of South Africa (including Eastern Cape), research on the household water insecurity remain underexplored. This paper contribute to the debate on water insecurity by researching the sources of drinking water, how water is accessed by local communities, and determine the barriers associated with access to potable water and management in the rural villages of Madiba and Enqabeni in the Eastern Cape Province. Unlike the studies above, this study show how the apartheid's unequal water policy is still influencing water services in the democratic South Africa. Understanding water insecurity in the context of Eastern Cape is important because household water insecurity happen differently in different provinces. The results of this study will not only be important for the government and policymakers, but will also help to understand how local communities' rights and interests in water are systematically and persistently violated.

Water (in)justice as a conceptual framework

In recent years, the concept of water injustice has garnered increasing attention from scholars, advocates and regulators. Water injustice is conceived here as a subset of environmental justice that deals with the unfair treatment of communities regarding water issues (McLean, 2007). Although there is no single universal definition, according to recent literature, *water injustice* happens when there is an unequal distribution of rights to access healthy and affordable water (Zwarteveen and Boelens, 2014), the lack of participatory practices in decision-making processes (McLean, 2007), and the misrecognition of culturally diverse ways of equitably and sustainably managing the interaction between

water systems and social systems (Zwarteveen and Boelens, 2014; Liévanos, 2017).

From this explanation, it is clear that unfairness, inequity, inadequate participation and lack of justice in terms of access to water resources constitute *water injustice* (Sultana, 2018). In line with this definition, 'access to healthy and affordable water' is recognized by the United Nations as a human right. As Gleick (1998) has noted, the term *right* is used in the sense of genuine rights under international law, where States have a responsibility to protect and promote those rights for an individual. This begs the question; how much water is necessary to satisfy this right? The WHO and UNICEF have set 20 liters as the minimum amount of safe drinking water a person requires per day (WHO/UNICEF, 2000). Below this minimum allowance of water, people are considered to be under extreme water stress (Gleick, 1998; Islam et al., 2007). According to Carr et al. (2015), when inequality in access to potable water resources leaves some populations in conditions of extreme water stress, the human right to water is violated and such inequality is unjust. The concept of water injustice provides a useful lens for understanding water problems as problems of justice and equality.

Methodology

Study area

The study was conducted in Madiba and Enqabeni rural villages that fall under Winnie Madikizela-Mandela Local Municipality, which is situated in the Alfred Nzo District Municipality in the Eastern Cape Province (Figure 1). These villages were strategically selected because majority of people still rely on untreated water from open water bodies in the democratic South Africa. Enqabeni is located between Envis and Ludeke at latitude 30°53′51"S and longitude 29°41′59" E while Madiba is located between Greenville and Ntlakhwe at latitude 30°51′41.54" S and longitude 29°51′27.50" E. The main town under the Winnie Madikizela-Mandela Local Municipality is Bizana; the town takes pride in its cultural diversity comprising the Xhosa, Mpondo, Sotho and Nguni ethnic groups. Bizana is located at the border between KwaZulu-Natal and Eastern Cape Province. Like the rest of the Eastern Cape Province, the Xhosa are the dominant race group. Even though the land in both villages is owned by the state, decisions on granting permits for villagers and visitors to use different lands rests with local traditional leaders. The primary land uses in the villages are livestock husbandry, subsistence cultivation and human settlement.

Data collection

An ethical clearance certificate (with reference number 2022-11-18) was obtained from the Faculty Ethics Committee of the University of Johannesburg. Our identification cards and a letter showing our affiliation with the University were used to introduce us to the key respondents interviewed. All respondents were informed about the purpose of the study and were made aware that they could withdraw their participation at any time and without any penalties. In line with Kothari (2004), all respondents were asked for their permission before they were interviewed and respondents who agreed to participate were asked to sign a consent form. The informants had also been informed that their identity would remain confidential (and thus would not be made public). To fulfill the aim of this study, semi-structured interviews, interviewer-administered questionnaires, and field observations were employed as data collection tools. Semi-structured interviews were used to collect data from municipal officials, ward councilors and traditional leaders in each village. Municipal officials were interviewed to find out about infrastructural and institutional challenges regarding rural water supply and intervention strategies for rural water provision. Ward councilors and traditional leaders were interviewed to get information on the challenges that they and the community members are faced with owing to the lack of access to water (Figure 2). The average duration of each interview was ∼90 min.

Interviewer-administered questionnaires were used with local community members from both villages to gain insights into sources of drinking water, how water is accessed by local communities, and determine the barriers associated with access to potable water in the area. The questionnaire survey combined both closed- and open-ended questions. Closed-ended questions were employed to ensure accurate answers from informants, whereas open-ended questions were used to permit participants to speak freely in their own words (White et al., 2005). Questionnaires were first written in English and then translated into IsiXhosa (local language) by the bilingual researcher; translation was considered important for ensuring that the researcher communicated with local communities in their mother language. To ensure that the questions were clear and unambiguous, the questionnaire was pretested on 20 respondents who were not part of the study (Walliman, 2021). The tests showed that the questions were clear and easy to understand. Following Budlender (2003), the questionnaire targeted household heads (male or female) and an average duration of 30 min was spent on each home.

The adult member aged 18 years or older was interviewed in homes where heads of households were not present (Bernard, 2017). The observation was also employed to determine whether municipal plans for rural water delivery were in line with what was occurring. Furthermore, important information about the physical landscape (such as existing infrastructure, water sources, how water is accessed, and the distance between the water point and households) was observed and recorded in a notebook. Photographs were taken to serve as visual verification of what was happening in the study area.

Sampling procedure

Non-probability purposive sampling was used to select municipal officials, ward councilors and traditional leaders in each village. As Onwuegbuzie and Leech (2007) have noted, the logic and supremacy of purposive sampling lie in choosing information-rich cases that give the most insight into the research aim. Households in Madiba and Enqabeni rural villages were selected using a systematic random sampling approach. The systematic sample was chosen because it allows the sample to spread more evenly over the

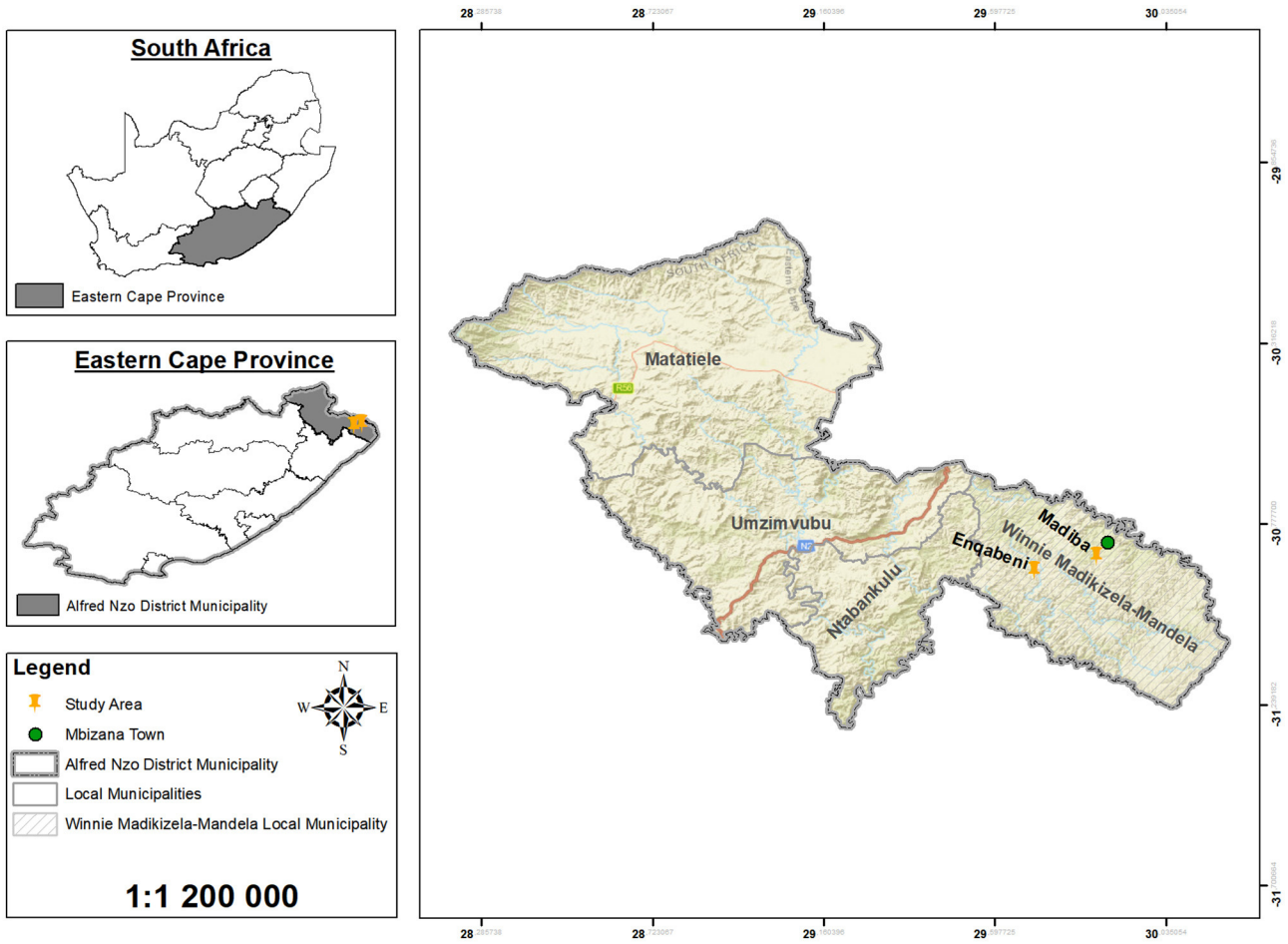

FIGURE 1
Location of Enqabeni and Madiba villages falling under Winnie Madikizela-Mandela local municipality.

population, but importantly it avoids human bias. In this sampling approach, the selection of the first subject is done randomly and then the subsequent subjects are selected using a periodic process (Acharya et al., 2013). We relied on Roscoe (1975) guideline that suggests that a representative sample can often be obtained by selecting 10% of the total households. Following this guideline, in Enqabeni which has 2,048 households, a sample of 205 households was selected whereas in Madiba with 1,307 households, a sample of 131 households was chosen (95% confidence level; 5% margin of error).

Data analysis

The data collected were documented on a datasheet, transcribed into English by the authors, and then tabulated in Microsoft Office Excel 2016 (Microsoft Corporation, Redmond, Washington, WA, USA). Data obtained from interviewing municipal officials, ward councilors and traditional leaders in each village was analyzed using thematic content analysis—"a qualitative analytic method for identifying, analyzing and reporting patterns or themes within data" (Braun and Clarke, 2006). The interviewer-administered questionnaires were analyzed using Statistical Package for Social Sciences version 28 for Windows (IBM SPSS Inc, Chicago, IL, USA). Chi-square (X^2) tests were applied to compare observed results with expected results, and this was done at the 5% significant level. For open-ended questions, the researchers generated codes from the responses by grouping similar responses from the questionnaires into one category. The codes were then registered into the SPSS and a descriptive statistics tool was used to analyse the codes and this helped to generate frequencies up to 100%. Furthermore, to give readers a clear picture of the situation, episodes from respondents were recounted using their exact words.

Results

Demographic information

For the questionnaire sample in Enqabeni village, a total of 73% ($n = 150$) of the sample were female respondents and 27% ($n = 55$) were male respondents, whereas in Madiba village, a total of 77% ($n = 101$) of the sample were female respondents and 23% ($n = 30$) were male respondents (Table 1). Women and elderly people were

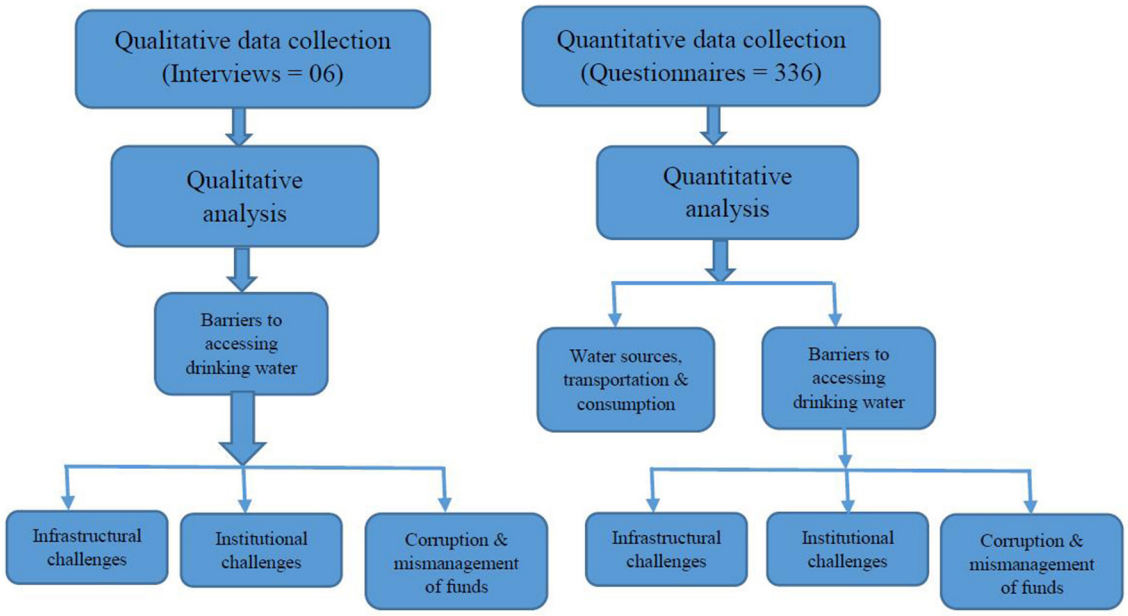

FIGURE 2
Summary of research methods followed and recurring patterns that emerged from analysis of data.

mostly found to be at home during the period of data collection and as a result, they became respondents for most households. Of the interviewees who participated in the survey in the Enqabeni village, 26% ($n = 53$) were 18–24 years old, 32% ($n = 66$) were 25–34 years of age, 17% ($n = 35$) were 35–44 years of age, 13% ($n = 27$) were 45–54 years, and 12% ($n = 24$) were > 54 years ($X^2 = 31$; df = 4; $p < 0.0001$). In Madiba village, a total of 32% ($n = 42$) of interviewees were between the ages of 18 and 24 years, 39% ($n = 51$) were between 25 and 34 years, 18% ($n = 24$) were between 35 and 44 years, 6% ($n = 8$) were between 45 and 54 years, and 5% ($n = 6$) were older than 54 years ($X^2 = 61$; df = 4; $p < 0.0001$). In both villages, the unemployment rate was high, with only 10% of the respondents employed in Enqabeni village ($P < 0.05$) compared to 23% in Madiba village ($X^2 = 38$; df = 1; $p < 0.0001$). The respondents varied significantly in sources of income in the two villages. For instance, in Enqabeni, 10% ($n = 20$) of the respondents' source of income was from salaries, 26% ($n = 53$) was from pensions, 45% ($n = 92$) was from social grants, 14% ($n = 28$) was from remittances sent by relatives working in cities, and the remaining 5% ($n = 12$) relied on disability grants ($X^2 = 102$; df = 4; $p < 0.0001$). In Madiba, 23% ($n = 30$) of the respondents got their source of income from salaries, 18% ($n = 24$) from pensions, 53% ($n = 69$) from social grants, 5% ($n = 7$) remittances sent by relatives working in cities, and 1% ($n = 1$) from disability grants ($X^2 = 109$; df = 4; $p < 0.0001$).

Water sources, transportation, and consumption

When asked about their main source of water, all the respondents (100%; $n = 205$) in Enqabeni village indicated that they obtained water from open water bodies (rivers, wetlands, streams, springs and ponds). Thus, rural communities that did not have access to water services during apartheid era continue to rely on open water bodies while their counterparts in urban areas (e.g., East London and Gqeberha city) that benefited during apartheid continue to enjoy water services in the democratic South Africa. In Madiba village, 70% ($n = 92$) of the respondents indicated that they obtained water from open water bodies, and the remaining 30% ($n = 39$) relied on one community borehole ($X^2 = 21$; df = 1; $p < 0.0001$). However, the community borehole did not have a pump and, as a result, people used containers to get water from the open hole (Figure 3). The study also found that communities in Madiba village were supplemented with potable water by water trucks on Tuesdays by the Alfred Nzo District Municipality, however, they were only allowed to get a maximum of 25ℓ per person which was insufficient. In contrast, communities in Enqabeni village did not get any assistance or support from the local or district municipality.

A total of 78% of the respondents in Madiba village ($X^2 = 122$; df = 2; $p < 0.0001$) and an even greater proportion (90%) in Enqabeni village ($X^2 = 300$; df = 2; $p < 0.0001$) used more than 45ℓ of water per day. This means that the majority of respondents spend most of their time collecting water so that they have enough water for daily consumption. When asked about the methods that are used to transport water, in Enqabeni village, the majority of the respondents (70%; $n = 143$) indicated that they carry 20 to 25ℓ of water on their heads, 20% ($n = 41$) use a wheelbarrow, and the remaining 10% ($n = 21$) used cars ($X^2 = 125$; df = 2; $p < 0.0001$). Similarly, in Madiba, the majority of the respondents (60%; $n = 79$) indicated that they carry 20 or 25ℓ of water on their heads, 35% ($n = 46$) used a wheelbarrow, and the remaining 5% ($n = 6$) used cars ($X^2 = 61$; df = 2; $p < 0.0001$). The study found that the majority of the respondents, particularly women in both of the

TABLE 1 Socio-economic profile of the respondents (n = 336) in the study area.

Categories	Class	Enqabeni (n = 205) %	Madiba (n = 131)%
Winnie Madikizela-Mandela Local Municipality, Bizana, Eastern Cape, South Africa			
Age	18–24 years	26	32
	25–34 years	32	39
	35–44 years	17	18
	45–54 years	13	06
	> 54 years	12	05
Gender	Male	27	23
	Female	73	77
Employment	Employed	10	23
	Unemployed	90	77
Source of income	Salaries	10	23
	Pension	26	18
	Social grants	45	53
	Disability grants	05	05
	Remittance	14	01
Total number of people in households	1–3	15	17
	4–6	53	61
	7–9	23	12
	> 9	09	10

villages carry water on their heads. As one woman in the Enqabeni village narrated:

> As women and girls, we are traditionally bound to collect water daily because we are expected to perform housework. As a result, we collect water regularly and the daily journey of collecting water has strained my head and back, and I have constant backache (Anonymous respondent, 07/01/2023).

When the respondents were asked about the distance traveled to go and collect water, the majority of the respondents (68%; n = 139) in the Enqabeni village indicated that they traveled more than 5 km daily to collect water. Similarly, just over half of the respondents in Madiba (52%; n = 68) also indicated that they traveled more than 5 km (Figure 4).

As a result, the time spent traveling to and from the river to collect water could have been used for other purposes. Schoolchildren also have to come back from school and go to the water sources to wash their school uniforms and collect water for domestic use. Unfortunately, this takes up time in which they could be doing their schoolwork. When asked what they used the water for, 83% of the respondents in Enqabeni village indicated that they used the water for drinking, cooking, and washing, whereas only 17% (n = 35) bought water from vendors only for drinking and cooking, but still relied on unsafe water from streams and rivers for washing and other domestic purposes. Similarly, although the majority of respondents in Madiba village relied on water from open water bodies, only 17% (n = 22) indicated that they bought additional water from vendors mainly for drinking and cooking. A higher percentage of respondents relied on open water bodies for cooking and drinking because they did not have extra money to buy clean water as many of them relied on child grants. When asked about the safety of the water, all the respondents in Enqabeni (100%; n = 205) and Madiba villages (100%; n = 131) indicated that the water was not safe because it was untreated. They indicated that to make matters worse, they shared the water with livestock (Figure 5) and that very often the water was polluted because livestock excrete and tramp in the water.

As one respondent explained:

> If you want clean water from the river, streams or ponds, you need to wake up very early in the morning. In the afternoon, the water is often dirty because of livestock that trample in the water and sometimes release excreta in the water. You have to boil the water before you use it, otherwise, we would all be dead by now. (Anonymous respondent, 12/01/2023)

As a result, these communities in Enqabeni and Madiba villages are likely to be exposed to pathogens that cause waterborne diseases such as diarrhea, typhoid and cholera, particularly those who do not boil water before use. These results show that the apartheid's unequal water policy of neglecting rural populations and prioritize people in urban areas in terms of water services continue to persist in the democratic South Africa. This has devastating effects on the lives and livelihoods of communities in rural areas.

Barriers to accessing drinking water

Infrastructural challenges

Infrastructure emerged as a critical factor affecting the distribution and supply of water in the study area. During the apartheid era, most rural communities, particularly from former homelands or Bantustans, did not have water infrastructure such as for a piped water distribution system; nor did they have boreholes or reservoirs to store water (Department of Water Affairs Forestry, 2004). Water infrastructure was in urban areas to serve white minority population. The Madiba and Enqabeni villages were formerly part of the Ciskei homeland. The municipal official who was interviewed confirmed that when these two villages were integrated into the Alfred Nzo District Municipality in the new South Africa, they did not have water infrastructure. When the new democratic government took over in 1994, one of its key promises was to maintain existing water infrastructure and build new infrastructure in areas where there was none to provide safe drinking water to communities (Department of Water Affairs Forestry, 2004). However, this study found that none of the promises made were fulfilled. For instance, all the respondents interviewed (100%; n = 205) in the Enqabeni village indicated that since the dawn of democracy in 1994, no efforts have been made by

FIGURE 3
Community collecting water from Madiba village.

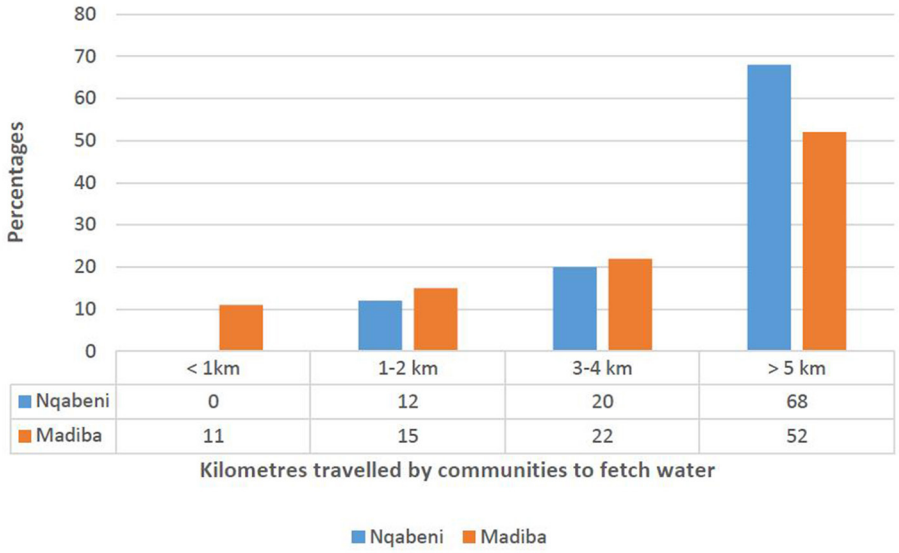

FIGURE 4
Distance traveled by communities to fetch water.

the government to provide the necessary infrastructure required or boreholes to supply the communities with water.

Similarly, the water situation has not improved in Madiba village. Despite few infrastructures having been constructed/installed in Madiba village after the new dispensation, the water situation had not improved after 1994. For instance, the respondents indicated that a community borehole was drilled in 2005. In addition, in 2008, four community taps were introduced in the village (Figure 6). However, in 2012, the hand pump of the borehole broke and has not yet been repaired. At the time of collecting the data, the communities were improvising by using containers to access water from the open hole that was always overflowing with water. Similarly, the four community taps that were supplying water to the local communities also broke and were never repaired by the municipality. As a result, since 2016, the communities in Madiba village have not have access to tap water.

The respondents revealed they had pleaded with the local municipality to repair the community taps and to install a new borehole pump. To date, nothing has been done to remedy the community's water infrastructure. The respondents also highlighted how they have reported the matter to the councilor, who also had not done anything about it. As one respondent explained: 'The councilor is very aware of the problem because he lives here with us. We have reported the matter to him, but

FIGURE 5
Livestock in one of the ponds used by local communities.

FIGURE 6
Four non-functional community taps that were introduced in 2008 in Madiba village.

nothing has happened' (Anonymous Respondent, 23/01/2023). The respondents felt that being ignored by the municipality and ward councilor was problematic; the councilor was democratically elected to serve the community. As one angry respondent noted:

> The community members democratically elected the ward councilor in hopes that they would show leadership, anticipate successful service delivery, and to also ensure the provision of customized social and economic solutions for the betterment of the community. However, like the municipal officials, he has not done anything to better the lives of the people in this community (Anonymous respondent, 23/01/2023).

When municipal officials were asked why there is no water infrastructure in Enqabeni and why the limited infrastructure in Madiba village has not been maintained, it was stated that there is insufficient bulk and reticulation infrastructure to store and transfer water to rural areas, a problem that was inherited from apartheid government. This presents a major challenge to the municipalities' ability to provide water to these areas. Other issues raised by municipal respondents were financial and technical constraints. Furthermore, insufficient funding is available for upgrading, replacing, running and maintaining the existing (aging) infrastructure; this inadequate funding constitutes a major barrier to municipal progress. One of the key infrastructure issues mentioned in the district is finding sustainable ways to provide infrastructure in remote locations owing to erratic settlement patterns. As a result, providing the necessary infrastructure to ensure basic water delivery to communities is difficult and costly. Thus, despite transition from apartheid to democracy, rural communities in the study area do not have water infrastructure and as a result, they remain without water whereas their counterparts in urban areas including East London, Gqeberha, Makhanda and Mthatha who benefited during apartheid continue to enjoy the supply of water in the democratic South Africa.

Institutional challenges

During the apartheid era, no central government department was dedicated to the universal supply and management of water resources in South Africa (Department of Water Affairs Forestry, 2004). Rather, the homelands were responsible for supplying water to their communities, but they were inefficient because of insufficient funding from the South African government. As a result, post-1994, the majority of people in rural areas lacked access to adequate water supply services (Department of Water Affairs Forestry, 2004) compared to urban areas. When Dr. Nelson Mandela became the first democratic president in 1994, the post-apartheid government promised South Africans that each household would have access to clean running water. The government established the Reconstruction and Development Programme, which gave DWAF the responsibility of ensuring universal access to basic water services. This led to the drafting of the White Paper on Water and Sanitation that was released in 1994, with emphasis on access to basic water supply. In addition, the Constitution of a democratic government was adopted in 1996. Chapter 2 of the Constitution provides that: "Everyone has the right to have access to sufficient food and water". Thus, the Constitution recognizes access to potable water to be a basic human right.

In the study area, the Alfred Nzo District Municipality is the responsible authority that has been mandated with the responsibility of providing safe drinking water and sanitation services to local communities in Madiba and Enqabeni. However, despite the introduction of the Constitution and progressive policies and legislation, the reality is that the communities still do not have access to safe drinking water. For instance, all the respondents (100%; $n = 205$) in Enqabeni indicated that despite the Constitution and the policies that are in place, they do not have access to safe drinking water. The communities in Madiba similarly indicated that they do not have access to basic drinking water. This means that the Constitution and policies related to providing water services have not yet been implemented, at least in Enqabeni or Madiba villages. When an official from the municipality was asked why communities do not have access to safe drinking water in democratic South Africa, it was indicated that budget planning and allocation of funds are not balanced by the authorities. It was stated by an official that the municipality receives less than half of the budget requested for water and sanitation. For instance, the budget request for the 2021/2022 financial year was R48 471 849 million and they only received R21 000 000. The municipal officials interviewed, also emphasized that there were not enough funds to implement the projects in the master plan for rural water service delivery. The effects of insufficient funding result in poor implementation of projects, backlogs and services not rendered to the community at all. In the end, the officials indicated that inadequate funding makes it difficult for the municipality to achieve its targets to supply the communities with water. Whereas the delivery or supply of water services in rural areas was poorly funded during apartheid, they continue to be neglected in the democratic South Africa and this has serious implications on their lives and livelihoods.

Corruption and mismanagement of funds

Corruption and mismanagement of funds have also emerged as challenges affecting water service delivery in the study area. When respondents asked if corruption is contributing to poor water service delivery, all the respondents in Enqabeni said *yes*. For instance, in Enqabeni village, the municipality initiated a rainwater harvesting project during COVID-19. The tanks were given to the traditional leader to distribute to the local communities. Each household in Enqabeni was supposed to get a JoJo tank so that they could harvest rainwater. However, only a few households benefitted from the project, with the majority of the respondents not getting any tanks. The study found that at some point, the traditional leader was selling the tanks that were meant to be given to communities free of charge. The communities felt that both the municipality and the local traditional leader were corrupt and hence the project did not achieve its aims and objectives. They also felt that there was a lack of accountability by both parties, which is unacceptable in a democratic government. Another respondent stated that the municipality always receives significant funds through various programmes, such as the Municipal Infrastructural Grant. However, such programmes have not always been effective

owing to the mismanagement of funds, which were either wasted on futile projects, diverted for other purposes, or simply went unaccounted for. Similarly, all respondents in Madiba said that the municipal authorities were corrupt and did not care about the communities. As one respondent narrated:

> The municipality always gets a budget for water and sanitation, so why can't they repair the water infrastructure in the village? Why can't they supply us with water tanks? Why can't they build the necessary infrastructure that will supply water to people? Why can't those officials who are failing to do their job get fired? This is all corruption. They do not care about us; they only care about our votes. (Anonymous respondent, 31/01/2023)

For this respondent, corruption is the biggest problem that is contributing to the lack of services in the area. When the official from the municipality was asked if other officials were involved in corruption scandals, he indicated that he was not aware of any corruption in the municipality. He indicated that the limited budget was the main constraint hindering water service delivery in the two villages. He nevertheless believed that the municipality could do more to help the community.

Discussion

This study has shown that the majority of the people in Enqabeni and Madiba villages rely on water unsafe for human consumption coming from open water bodies in the area. This reliance on unsafe water constitutes water injustice. The results of this study are in line with Edokpayi et al. (2017) who argued that surface water remains an alternative source of water to meet the domestic water demands in most rural areas. Developing countries—particularly in Southeast Asian regions (Osiemo et al., 2019) and sub-Saharan Africa (Dos Santos et al., 2017)—have the poorest access to safe drinking water. As in the study area, most rural residents in countries such as Uganda (Bwire et al., 2020), Nigeria (Dan-Nwafor et al., 2019), Kenya (Osiemo et al., 2019) and Bangladesh (de Magny et al., 2011) rely on surface water sources. Whereas communities from Enqabeni and Madiba rely on unsafe water from open water bodies, people in big cities of South Africa including Johannesburg, Pretoria, Durban, Cape Town, and Gqeberha have access to potable water (Department of Water Sanitation, 2018) that is comparable to what is found in other developed cities (Edokpayi et al., 2018). However, this is only true in urban centers and suburbs whilst people in informal settlements and peri-urban townships (dominated by blacks) still face serious challenges of access to water. For instance, some residents in Khayelitsha Township still face challenges of accessing water whereas their counterparts in urban centers and suburbs of Cape Town have access to clean water on a regular basis (Rodina, 2016; Enqvist and Ziervogel, 2019; Mokoena, 2022). Similarly, water inequality is also a problem in Gauteng where urban dwellers in Johannesburg and Pretoria have access to water whereas people in informal settlements struggle to access portable water (Chauke, 2017). The increased levels of service delivery protests in the Gauteng province are an indication of inequality in the provision of basic services such as water and sanitation (Breakfast et al., 2019). Despite urban municipalities having sufficient budgets, good revenue management, right personnel with technical skills, institutional capacity and funding to operate, maintain and manage water and waste water infrastructure assets properly (Department of Water Sanitation, 2018), they struggle to provide water particularly in townships and informal settlement that are dominated by blacks. Thus, townships and informal settlements dwellers who were excluded from water and sanitation services continue to suffer in the democratic era (Enqvist and Ziervogel, 2019). It is clear that the legacy of the Apartheid regime of unequal water access is still influencing water services in the democratic South Africa as those living in townships and informal areas do struggle daily to access water.

The open sources of water that communities obtain water from serve as the sinks for the discharge of domestic and industrial waste. Although there are no industries that discharge waste into the water bodies in the study area, the water is polluted by livestock that also drink the same water. The water is not only polluted by the trampling effect, but livestock also defecates into the water and reliance on such unhealthy water constitutes water injustice (Zwarteveen and Boelens, 2014). Fecal contamination of drinking water by livestock was also found to be common in Ghana and Bangladesh (Wardrop et al., 2018). Unfortunately, communities have no choice but to use untreated water. Bwire et al. (2020) estimated that 144 million people globally rely on untreated surface water daily. This exposes people and their associated communities to waterborne illnesses (Kwesiga et al., 2018). Although no incidences of waterborne disease were reported in the study area, Madhav et al. (2020) have recounted that drinking untreated or contaminated water may lead to illnesses such as cholera, diarrhea, dysentery and polio. For instance, cholera is reported to cause thousands of deaths, particularly in Africa, Asia and Latin America (Bwire et al., 2020). Reliance on open water bodies also means that communities in the study area do not get access to a minimum quantity of 25 liters of water per person per day as guaranteed by the Water Services Act 108 of 1997. As Islam et al. (2007) have noted, if the minimum allowance for water is not met, communities are regarded as suffering from high or extreme water stress, which is deemed to be unfair or unjust. This is similar to apartheid era where the minimum quantity of water was not met in rural areas as majority of people relied on open water bodies that was not safe for human consumption.

This study also found that the majority of the respondents, particularly women and school children in both Madiba and Enqabeni villages traveled more than 5 km to get water since they lived far from the water sources. Similarly, people in townships as in the case of Site C in Khayelitsha who do not have in-house taps have to rely on communal taps which is often inconvenient and unsafe (Rodina, 2016). In contrast, people in cities such as Cape Town, Pretoria and Johannesburg have piped water access in their dwellings (Department of Water Sanitation, 2018), and this constitute what Cole et al. (2018) call spatial water inequality. Thus, the women in rural, townships and informal settlements spent a disproportionate amount of their time collecting water instead of spending their precious time doing productive activities. This is a violation of human rights and is unjust. Similarly, Ugandan women make long and repeated trips to the source of water to

meet their family's water demands as there is no water supply in their area (Asaba et al., 2013). This was found not only to be a time-consuming and stressful task but also hinders women from benefitting fully from economic and development opportunities (Abubakar, 2019). The process of women carrying heavy buckets of water on their heads was also found to have significant impacts on their health. Other studies have reported that carrying heavy buckets of water leads to upper back, hand or shoulder pain (Geere et al., 2018), stiffness of the neck and spinal pains and musculoskeletal problems (Kadota et al., 2020). Regarding school children who also collect water, Graham et al. (2016) reported that Burundi, Cameroon, Ethiopia, Mozambique, Niger and Nigeria had more than 100 000 households where children (particularly females) were responsible for water collection, traveling a distance that takes more than 30 minutes (Graham et al., 2016). As Hemson (2007) has noted, this practice causes fatigue and makes it difficult for pupils to concentrate on their studies.

The Alfred Nzo District Municipality inherited Enqabeni and Madiba villages without water infrastructure, during the transition to democracy in 1994; however, despite the passing of several decades since then, very little has been done to build and maintain the necessary infrastructure that can allow the communities to have access to potable water. For instance, since the dawn of democracy in 1994, no effort has been made to provide the necessary infrastructure to supply the communities with water in Enqabeni village. This is not unique to Enqabeni village; Bulled (2017) also found that since 1994, Dzimauli village under the Vhembe District Municipality (Limpopo province) had not benefitted from any water infrastructure. Similarly, in many rural areas of Nigeria (Ihuah and Kakulu, 2014) and the Philippines (Rola et al., 2015), water infrastructure is almost non-existent and rural communities are compelled to rely on unsafe water sources. This study also found that although four community taps were installed in Madiba village in 2008, lack of maintenance meant they were not functioning. This is not unique to Madiba village; the reality is that there is poor maintenance of infrastructure in most rural communities in developing countries (Matlakala and Von Kallon, 2021). The water and sanitation foundation FairWater estimated that there were 50 000 dysfunctional water supply infrastructure projects across Africa, which represents a failed investment of anything from US$ 215 to US$ 360 million, and this impacts the health, lives and livelihoods of communities (Skinner, 2009).

This study has also found that since the establishment of the new democracy in 1994, South Africa has been at the forefront of formulating policies, rules and regulations that encourage universal access to basic water services for all South Africans. Yet despite the Constitution and progressive water policies, Alfred Nzo District Municipality has failed to provide safe drinking water and sanitation services to local communities in Madiba and Enqabeni. In line with Sultana (2018), this constitutes water injustice. Similarly, after independence, many governments in Africa have passed a plethora of legislation and guidelines to address water scarcity, supply and distribution. Nevertheless, countries including Tanzania (Jiménez and Pérez-Foguet, 2010), Nigeria (Akpan, 2012), Ghana (Dankwa et al., 2018), Zimbabwe (Dhoba, 2020) and Namibia (Salom and Khumalo, 2022) still have not made major progress in supplying water to rural areas. The literature also suggests that countries such as India (Sharma, 2021) and Albania (Rohde et al., 2004) have seen only limited progress in rural water supply since independence. This has serious implications in achieving SDG 6 (clean water and sanitation for all). Thus, democracy and reform in policies related to water supply and distribution have not helped to solve the problems of water, particularly in rural areas. It can be argued that despite the Constitution and introduction of progressive policies, rules and regulations related to water governance, the legacy of apartheid's unequal water policy is still influencing water services in South Africa. The Alfred Nzo District Municipality has been identified by communities as a failed institution in terms of providing rural water systems and implementing government policies. Similarly, failed institutions and uncoordinated policies were identified as the main institutional challenges affecting the management of rural water systems in the Northwest Region of Cameroon (Tantoh et al., 2020). In addition, the communities also felt that there was no government or political will to provide the communities with water as in the case of Karachi in Pakistan (Ahmed, 2009).

The communities in Madiba and Enqabeni were of the view that the officials from the Alfred Nzo District Municipality were corrupt because they were not doing anything (no fairness) to improve water supply and distribution in the area. The communities also felt that the money meant to improve the water situation was either mismanaged, wasted on fruitless projects, used for other expenditures, or simply unaccounted for by the municipality. In addition, the communities in Enqabeni village felt that the traditional authorities were corrupt because, instead of giving the water harvesting tanks to communities, they were selling them to community members. The issue of corruption and mismanagement of funds have also been cited as the biggest challenge affecting potable water supply to communities in Ekiti State in Nigeria (Adeoti and Fati, 2020), Zimbabwe (Mapira, 2011), Kenya (de la Harpe and Butterworth, 2009), Northwest Cameroon (Tantoh and Simatele, 2017) and Peru (Ioris, 2016). Corruption in the water sector takes many forms including bribes, diversion of water from small- to large-scale users, lack of adherence to procurement procedures (de la Harpe and Butterworth, 2009), and nepotistic awarding of tenders to family and friends (Ogbu and Asuquo, 2018). As a result, the minority in power misused, diverted or embezzled and stashed away funds in foreign banks earmarked for developing water projects that would benefit local communities (Ayoade, 2016). This ends up affecting the majority of people living in poverty who are supposed to be the beneficiaries.

Conclusion

This study found that the majority of people in the study area still rely on untreated water from open water bodies and the municipality is unable to provide a minimum quantity of 25 l of water per person per day. As a result, the human right of access to water for the communities of Madiba and Enqabeni is violated and such an inequality is unjust. The study also identified corruption, and infrastructural and institutional problems as barriers affecting water service delivery to communities. As a result, there is a lack of fairness, equity and justice in terms of water resource access which constitutes water injustice. This has devastating effects on the lives and livelihoods of communities.

Despite the promises that were made by the democratic government in South Africa to provide access to water to all citizens, the people who live in poverty, particularly in rural villages, townships and informal settlements, remain without water. Instead of bridging the gap in terms of water supply, the gap is widening because the government has invested very few resources in water services, particularly in rural areas, townships and informal settlements. Thus, those people in urban centers and suburbs who had access to water supply during the apartheid era have ongoing access to water services, whereas many people in rural areas, townships and informal settlements continue to live as they did before the new dispensation, without water.

Thus, democracy has not brought anything new regarding water services and access to safe drinking water. While South Africa has progressive policies and legislation to transform the water sector, these are only pieces of paper and are not being implemented—at least not in rural areas, townships and informal settlements. The legacy of apartheid's unequal water policy is still influencing water services in the democratic South Africa. It can therefore be concluded that unless something drastic happens, South Africa is far from achieving SDG 6 by 2030. This will continue to have devastating impacts on the lives and livelihoods of rural communities, including the risk of exposed to pathogens that cause waterborne diseases such as diarrhea, typhoid and cholera. Urgent basic measures need to be taken to remedy the situation for these and other rural communities. To ensure that the water is not harmful to people, this study recommend that communities should always boil the water to make the water safe for consumption. Boiling water will help in killing heat-sensitive pathogens like bacteria, viruses and protozoa (Pan et al., 2014; Cohen and Colford, 2017). After boiling water, bleach should be added into warm water and this will help to further kill any pathogens that may be still available (Van Koppen et al., 2020). Another simple and effective way is filtering water on-site before using it for domestic purposes. This involves separating impurities and contaminants from water by passing it through a medium (e.g., river sand) that traps or absorbs pollutants. This process may help to remove particles, sediment, bacteria, viruses and chemicals that may be present in the water (Mohamed et al., 2016). Thus, boiling water, applying bleach and filtering water will help to improve the quality of the water. It is also recommended that the district municipality should provide each household with water storage tanks that can be connected to the roof for harvesting rainwater. As Kahinda et al. (2007) have noted, domestic rainwater harvesting help to improve water supply in rural areas. In the absence of rain, the communities can fill those tanks with water and this will not only help to meet water needs for few weeks, but will also save time traveling to collect water on a daily basis and allow women to engage in productive activities. Local municipality should also invest in water infrastructure which include construction of reservoirs for storage of water followed by a network of piped water distribution system. This will help to reduce the gap in terms of water access. The local municipality should also investing in drilling boreholes which can also help the communities with water. This will help to minimize reliance of water from open water bodies. The national government should also provide sufficient budgets to local municipality dedicated for water provision in rural areas, townships and informal settlements to build water infrastructure. Local municipality should also employ qualified personnel with technical skills, institutional capacity to plan, implements water policies, improve and maintain water infrastructure assets. In addition, the issue of corruption and mismanagement of funds needs to be investigated by independent body and those who are found guilty should be held accountable. The managers and office bearers responsible for water services in the municipality also require to be investigated in order to improve accountability. All those who are not doing their duties or who are responsible in wrongdoing should be fired with immediate effect irrespective of their political affiliation.

Data availability statement

The original contributions presented in the study are included in the article/Supplementary material, further inquiries can be directed to the corresponding author.

Ethics statement

The studies involving humans were approved by Faculty of Science Ethics Committee, University of Johannesburg. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

NS: Conceptualization, Data curation, Investigation, Methodology, Project administration, Software, Supervision, Writing – original draft, Writing – review and editing. ZM: Data curation, Formal analysis, Investigation, Methodology, Project administration, Resources, Software, Validation, Writing – original draft, Writing – review and editing.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships

that could be construed as a potential conflict of interest.

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Supplementary material

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/frwa.2024.1354477/full#supplementary-material

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