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# ACCESS TO ALTERNATIVE WATER SOURCES AND PERCEPTIONS OF WATER SERVICE PERFORMANCE IN LUKOBE WARD, MOROGORO MUNICIPALITY, TANZANIA

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**ABSTRACT**
Drought and the consequent decline in water levels in dams, rivers, and streams have exacerbated water shortages in the Morogoro Region. In some instances, residents receive piped water only once or twice a week, often with low water pressure. This study was conducted in Lukobe Ward, one of the areas in Morogoro Region that faces severe challenges in accessing piped water. The article examines the accessibility of alternative water sources and explores households' perceptions of the performance of water service delivery in Lukobe Ward, Morogoro Municipality. The study employed a cross-sectional research design and utilised a mixed-methods approach to collect both quantitative and qualitative data. Quantitative data were analysed using descriptive statistics and one-way Analysis of Variance (ANOVA), while qualitative data were subjected to content analysis. Data were gathered from 120 respondents through household surveys, key informant interviews, and focus group discussions. Findings revealed significant differences in the distance to water sources among the three streets studied ($F = 19.965$; $P = 0.000$). The overall mean distance from households to water sources was 633.45 metres, with a standard deviation of 1015.77 metres. However, no statistically significant difference was observed between Lukobe Kambi Tano and Lukobe Juu ($P = 0.0581$). Furthermore, a higher proportion of male respondents (60.0%) reported spending less than 60 minutes fetching water compared to female respondents (58.1%). The majority of households agreed that alternative water sources do not adequately meet domestic needs. Based on the findings, the study concludes that access to domestic water sources within the recommended 400 metres has not yet been achieved for most households in Lukobe Ward. It is therefore recommended that the Morogoro Municipal Council, through local government authorities, strengthen collaboration with key stakeholders including financial institutions to enhance the enabling environment for financing water and sanitation services in water-scarce communities.

**Keywords:** Water access, Alternative sources, Households' perceptions, Morogoro region
**Paper type**: Research paper
**Type of Review:** Peer review

## 1. Introduction

More than 1 billion people worldwide have no access to clean drinking water (UNDP, 2014). Nearly 51 per cent (300 million people) in sub-Saharan Africa lack access to safe and clean water, and 41 per cent lack adequate sanitation (WUP, 2013). This means that nearly half of the global population without improved drinking water resides in Sub-Saharan Africa. In addition, about 14 per cent of people *do not* have access to improved water sources and rely on unprotected groundwater sources such as wells, springs, lakes, or rivers to meet their water needs (Joint Monitoring, 2010). Currently, fourteen African countries are already experiencing water stress, and projections indicate that another eleven will join them by 2025. By that time, nearly 50 per cent of Africa's projected population of 1.45 billion people will be living under conditions of water stress or scarcity (AMCOW, 2011). Yet, access to improved water sources does not always guarantee adequate or affordable provision. The effects of limited access to clean water are widespread. Recent studies indicate that two out of every five people in Sub-Saharan Africa lack access to drinking water (Ntouda et al., 2013).

In the context of Tanzania, Sustainable Development Goal (SDG) 6 aims to ensure the availability and sustainable management of water and sanitation for all by 2030. Achieving universal and equitable access to safe and affordable drinking water will play a critical role in solving water access challenges. The World Health Organization (WHO) and UNICEF Joint Monitoring Programme (JMP) defines access to safe water as "the proportion of the population using an improved drinking water source" (UNICEF/WHO, 2012). However, failure to ensure consistent water service access in Tanzania remains a longstanding issue. For instance, in Morogoro Municipality, Doreen and Rose (2016) reported that the Morogoro Urban Water Supply and Sanitation Authority (MORUWASA) demonstrated poor performance in delivering water services. Although MORUWASA was granted operational autonomy following the 1991 National Water Policy—tasked with enhancing efficiency in water supply across the Morogoro Region—challenges remain unresolved. Uisso (2016) similarly observed a continuous decline in freshwater accessibility in Morogoro Urban. Limited access to water for basic needs such as drinking, cooking, bathing, and cleaning continues to contribute to poverty-related social problems. In this regard, good access to water implies a reliable water source that supplies water of adequate quantity and acceptable quality (Kristof, 2005).

Water is essential to life as it significantly influences public health and living standards. Despite this, water remains unequally distributed worldwide. Various studies, such as Fan et al. (2014), have explored public perceptions of water consumption and its impact on water conservation behaviour. Other studies (e.g., Pavelic et al., 2012) have examined community awareness regarding water institutions. Still, further research has focused on the challenges surrounding access to clean and safe domestic water, often attributed to limited governmental capacity to expand and maintain piped water infrastructure (Bayu et al., 2020; Kabote & John, 2017). Rugemalila and Gibbs (2015), for example, investigated urban water governance failures and local strategies for overcoming water shortages in Dar es Salaam, Tanzania.

In Morogoro Region, drought and resulting reductions in lake, river, and stream levels have intensified existing water shortages. Consequently, regular water rationing has become common in areas served by piped water. Residents frequently receive water only once or twice per week and often with low pressure. As a result, many households are forced to rely on alternative water sources, which may be less safe and more expensive. Despite several studies conducted in Morogoro, limited information exists regarding access to alternative water sources and households' perceptions of the performance of water service delivery, particularly in Lukobe Ward. This study was therefore conducted in Lukobe Ward, one of the areas most affected by inadequate access to piped water in the Morogoro Region. The study sought to address the following research questions: (i) To what extent do households in Lukobe Ward, a rapidly growing area, access alternative water sources? and (ii) What are the households' perceptions of the performance of water service delivery?

## 2. Research Methods

This study was conducted in Lukobe Ward, located in Morogoro Region. Morogoro Municipality lies between latitude 5°58′ and 10°00′ South of the Equator and longitude 35°25′ and 35°30′ East. The area is situated at an altitude of approximately 495 metres above sea level. It experiences a tropical climate, with an average annual temperature of 24.6°C (76.3°F) (URT, 2004). The mean annual rainfall is around 935 mm. Morogoro Municipality covers an area of 260 square kilometres and is administratively divided into nineteen wards (URT, 2004). According to the 2012 Population and Housing Census, the Municipality had a total population of 315,866, comprising 151,700 males and 164,166 females (NBS, 2012). Specifically, in Lukobe Ward, the population figures were as follows: Mgudeni had 4,430 people, Lukobe Kambi Tano had 1,621, and Lukobe Juu had 1,034 individuals.

This study employed a cross-sectional research design, which allows data collection at a single point in time (Pandis, 2014). A mixed-methods approach was adopted, incorporating both quantitative and qualitative data collection techniques. In the first phase, qualitative data were gathered through key informant interviews (KIIs) and focus group discussions (FGDs), using a semi-structured interview guide and FGD checklist respectively. In the second phase, quantitative data were collected via a household survey using a structured questionnaire. The study population targeted household heads, both male and female. Two sampling strategies were employed: probability and non-probability sampling techniques. For probability sampling, simple random sampling was used to select household respondents aged 18 years and above. For non-probability sampling, purposive sampling was applied to select three streets—Lukobe Kambi Tano, Lukobe Juu, and Mgudeni—identified as being severely affected by water scarcity. These areas have previously been reported to suffer from limited access to piped water services (Doreen and Rose, 2016). From each of the three selected streets, 40 households were randomly chosen, yielding a total sample of 120 respondents. This sample size aligns with Bailey (1998) and Bartlett et al. (2001), who recommend a minimum of 30 respondents per group for statistical validity.

One FGD was conducted in each street to obtain in-depth information about household access to alternative water sources. Three key informants, one from each street, were purposively selected for KIIs; these included local leaders such as Lukobe Ward chairpersons. The household survey gathered data on demographic characteristics, types of water sources used, distance to water sources, time spent collecting water, and household perceptions regarding the performance of water services. The KIIs focused on issues such as the quality and reliability of water sources used by residents in the selected streets.

Descriptive statistics were employed to summarise frequencies and percentages related to household water sources and the time spent accessing them. Access to alternative water sources was further examined using inferential statistics; specifically, a one-way analysis of variance (ANOVA) was conducted to compare levels of access in terms of distance from households to water sources. ANOVA is an appropriate statistical method for comparing mean differences in continuous variables across multiple groups, provided the data are normally distributed (Pallant, 2007). Additionally, an index summated scale was constructed to assess household perceptions of the performance of alternative water sources. Respondents were asked to indicate their level of agreement with a series of statements using a five-point Likert scale: strongly disagree (1), disagree (2), neutral (3), agree (4), and strongly agree (5).

## 3. Findings and Discussions

### 3.1 Respondents' Socio-demographic Characteristics

Table 1 presents the socio-demographic characteristics of the respondents. The findings indicate that a majority (61.8%) of the households were headed by females. This suggests a significant presence of female leadership at the household level within the study area. In terms of age distribution, nearly half of the respondents (48.4%) fell within the age range of 36–54 years, indicating that most household heads were middle-aged adults, likely to be actively engaged in economic and social responsibilities. Furthermore, the results reveal that 68.7% of the respondents were married, with a notable concentration of these married individuals (80.9%) residing in Mgudeni Street. In terms of household size, the majority (55%) reported having between 4 and 6 household members. The average household size was calculated at 4.4 persons, which is slightly below the national average of 4.9 persons per household (URT, 2012). This suggests that most families in the study area tended to have relatively smaller household sizes, typically comprising fewer than seven members. Regarding educational attainment, more than half of the respondents (58.1%) had completed primary education. This indicates that the majority had attained basic literacy and numeracy skills, which are essential for participating in social and economic activities and for personal development (URT, 2000). In terms of livelihood activities, 45.7% of the respondents reported engaging in petty business as their primary source of income, while 18.6% were involved in registered businesses. These findings align with national statistics, which highlight the prominence of small-scale business activities as a key livelihood strategy for many Tanzanian households (URT, 2012).

**Table 1: Respondents' Socio-demographic characteristics (n=120)**

| Variables | Lukobe Kambi Tano | Lukobe Juu | Mgudeni | Total |
|---|---|---|---|---|
| **Sex** | | | | |
| Male | 14(35.0) | 15(45.5) | 16(34.0) | 45(38.2) |
| Female | 26(65.0) | 18(54.5) | 31(66.0) | 75(61.8) |
| **Total** | **40(100)** | **33(100)** | **47(100)** | **120(100)** |
| **Age (years)** | | | | |
| 18 - 35 | 19(47.5) | 12(36.4) | 16(34.0) | 47(39.3) |
| 36 - 54 | 17(42.5) | 17(51.5) | 24(51.1) | 58(48.4) |
| 55+ | 4(10.0) | 4(12.1) | 7(14.9) | 15(12.3) |
| **Total** | **40(100)** | **33(100)** | **47(100)** | **120(100)** |
| **Marital status** | | | | |
| Single | 9(22.5) | 11(33.3) | 5(10.6) | 25(22.1) |
| Married | 27(67.5) | 19(57.6) | 38(80.9) | 84(68.7) |
| Widowed/widower | 4(10.0) | 3(9.1) | 4(8.5) | 11(9.2) |
| **Total** | **40(100)** | **33(100)** | **47(100)** | **120(100)** |
| **Family size** | | | | |
| 1-3 | 7(17.5) | 10(30.3) | 13(27.6) | 30(25.2) |
| 4-6 | 25(62.5) | 17(51.5) | 24(51.1) | 66(55.0) |
| 7-11 | 8(20.0) | 6(18.2) | 10(21.3) | 24(19.8) |
| **Total** | **40(100)** | **33(100)** | **47(100)** | **120(100)** |
| **Education level** | | | | |
| Non-formal | 2(5.0) | 2(6.1) | 3(6.4) | 7(5.8) |
| Primary | 26(65.0) | 15(45.4) | 30(63.8) | 71(58.1) |
| Secondary | 8(20.0) | 9(27.3) | 12(25.5) | 29(24.3) |
| Tertiary | 4(10.0) | 7(21.2) | 2(4.3) | 13(11.8) |
| **Total** | **40(100)** | **33(100)** | **47(100)** | **120(100)** |
| **Hh/head occupation** | | | | |
| Agriculture | | | | |
| Employed | 8(20.0) | 2(6.1) | 7(14.9) | 17(13.7) |
| Registered business | 4(10.0) | 8(24.2) | 7(14.9) | 19(16.4) |
| Petty business | 3(7.5) | 11(33.3) | 7(14.9) | 21(18.6) |
| Homemaker | | | | |
| **Total** | 22(55.0) | 11(33.3) | 23(48.9) | 56(45.7) |
| | 3(7.5) | 1(3.0) | 3(6.4) | 7(5.6) |
| | **40(100)** | **33(100)** | **47(100)** | **120(100)** |

Note: Numbers in brackets are percentages; Hh=household

### 3.2 Alternative Water Sources Used at the Household Level

Table 2 presents the distribution of alternative water sources used by households across the three streets involved in the study. The findings show that all respondents (100%) in Lukobe Juu, Lukobe Kambi Tano, and Mgudeni reported using water supplied by vendors and harvested rainwater. This widespread reliance on vendors and rainwater harvesting aligns with findings by Bourque (2010), who reported that the majority of households in similar contexts obtain water through private vendors. In addition, 63.1% of respondents reported purchasing water from private sources, while 61.1% indicated they used shallow wells as a primary or supplementary water source. Notably, the use of shallow wells was particularly common in Lukobe Juu and Lukobe Kambi Tano, with 90.9% and 77.5% of households in those areas, respectively, relying on this source. These findings are supported by Mangizvo and Kapungu (2010), whose study in Zimbabwe revealed that residents frequently dig shallow wells for domestic use. Similarly, Starkey (2012) highlighted that in many parts of the developing world, communities rely on dug wells as a long-term solution to water shortages, as these sources are more sustainable for collective use compared to individual supply options. Although wells can help mitigate water scarcity, their safety and reliability often vary, especially when they are unprotected or poorly maintained. This concern is echoed in the focus group discussions. For example, a participant from Lukobe Juu expressed the following:

> "…we do not prefer shallow wells sources because of health problems caused by unprotected wells. When we often use unprotected water from wells for drinking, we are at the risk of having waterborne diseases like typhoid and cholera. Sometimes when we fetch water from wells, we see a lot of contaminated materials like plastics, so we are afraid of using it. Therefore, we prefer buying drinking water from vendors" (FGD participant, Lukobe Juu Street, 14th February 2020).

This statement underscores the perceived risks associated with shallow wells and the community's preference for vendor-supplied water, particularly for drinking purposes.

**Table 2: Alternative Water sources used by households (n=120)**

| Water sources | Response | Lukobe Kambi Tano | Lukobe Juu | Mgudeni | Total |
|---|---|---|---|---|---|
| Water vendors | Yes | 40(100) | 33(100) | 47(100) | 120(100) |
| | No | 0(0) | 0(0) | 0(0) | 0(0) |
| Private sources | Yes | 9(22.5) | 22(66.7) | 47(100) | 78(63.1) |
| | No | 31(77.5) | 11(33.3) | 0(0) | 42(36.9) |
| Shallow wells | Yes | 31(77.5) | 30(90.9) | 7(14.9) | 68(61.1) |
| | No | 9(22.5) | 3(9.1) | 40(85.1) | 52(38.9) |
| Rainwater | Yes | 40(100) | 33(100) | 47(100) | 120(100) |
| | No | 0(0) | 0(0) | 0(0) | 0(0) |

Note: Numbers in brackets are percentages

### 3.3 Differences in Distances from Home to Water Sources Among Streets

The differences in distances from households to water sources across the three streets were assessed using a One-way Analysis of Variance (ANOVA). This statistical test was appropriate as the independent variable (street) consisted of three groups, while the dependent variable was the distance from home to water sources. The ANOVA results revealed a statistically significant difference in the distances to water sources among the streets ($F = 19.965$, $p = 0.000$). This finding implies that some households were located relatively closer to water points, whereas others had to travel significantly farther. As shown in Table 3, the overall mean distance from households to water sources was 633.45 meters, with a standard deviation of 1015.77 meters. These findings are consistent with a study by Jansz (2011) conducted in Niassa Province, Mozambique, which reported an average household-to-water-point distance of approximately 700 meters.

According to the National Water Policy (NAWAPO) of 2002, water is considered accessible when one water point serves 250 persons within a radius of 400 meters, and users spend no more than 30 minutes on a round trip to fetch water (URT, 2002; Mandara et al., 2016). Therefore, the findings of this study indicate that some water sources in the area were not easily accessible, falling short of national accessibility standards. Furthermore, the results contradict the provisions of the Tanzania National Water Policy (2002), which highlights that access to water should involve minimal walking distances to nearby water points. Tereza (2011) also emphasised that household water use, and allocation should be directly linked to the accessibility of water supply sources. This situation was illustrated by a key informant during the fieldwork:

> "We have few water points in our streets, and we only have two shallow wells here in Lukobe Kambi Tano Street, while there is none in Lukobe Juu Street. Hence, people from Lukobe Juu share the water fetched from wells with Lukobe Kambi Tano's. This led people from Lukobe Juu to walk a long distance up to water points in Lukobe Kambi Tano Street to fetch water." (Key informant from Lukobe Kambi Tano Street, 13th February 2020).

This statement highlights the burden placed on residents, particularly those from Lukobe Juu, who must travel longer distances due to the limited number of water access points within their area.

**Table 3: Differences in Distances from home to Water Sources among Streets (n=120)**

| Streets | N | Mean (meters) | Sum of squares between and within the group | | df | Mean square | F | Sig(p-value) |
|---|---|---|---|---|---|---|---|---|
| Lukobe Kambi Tano | 40 | 989.25 | Between groups | 31241924.4 | 2 | 15620962.2 | 19.965 | 0.000 |
| Lukobe Juu | 33 | 1104.39 | Within groups | 91543215.3 | 117 | 782420.6 | | |
| Mgudeni | 47 | 0.00 | | | | | | |
| **Total** | **120** | **633.45** | | **122785139.7** | **119** | | | |

*The mean difference is significant at the 0.05 level

**3.4 Differences in Distance from Home to Water Sources Between Streets**

A One-way ANOVA followed by a post hoc test was conducted to determine the differences in distance from households to water sources between the three streets. The post hoc test compared each possible pair of streets such as Lukobe Kambi Tano and Lukobe Juu, Lukobe Kambi Tano and Mgudeni, and Lukobe Juu and Mgudeni with corresponding p-values of 0.581, 0.000, and 0.000, respectively, as shown in Table 4. The results reveal statistically significant differences in the distance from households to water sources between Lukobe Kambi Tano and Mgudeni, and between Lukobe Juu and Mgudeni (P = 0.000). This finding suggests that residents of Mgudeni were generally located closer to water sources compared to those in the other two streets. It also implies that a majority of respondents in Mgudeni obtain water from vendors, which often eliminates the need for travelling long distances to fetch water. These findings contrast with the literature, which reports that in some arid regions, approximately 50% of households collect water from distances exceeding 3000 meters from their homes (Mkonda, 2015). Furthermore, the results differ from the Joint Monitoring Programme (2010) report, which indicated that about 14% of people in developing countries lack access to improved water sources, relying instead on unprotected wells, springs, canals, lakes, or rivers. The qualitative data gathered during fieldwork further highlight the challenges faced by residents in accessing water. As one focus group discussant from Lukobe Kambi Tano noted:

> "Unimproved water sources decreased users' satisfaction with both quality and quantity for domestic water uses, especially drinking water. However, households' water satisfaction with the availability is lower than satisfaction with quantity…" (FGD participant, Lukobe Kambi Tano Street, 14th February 2020).

Similarly, a participant from Lukobe Juu Street shared:

> "…we use much time to go and fetch water. However, sometimes we miss it or we get too few litres which do not cater [for] our households' needs for our daily use…" (FGD participant, Lukobe Juu Street, 14th February 2020).

In contrast, the results showed no statistically significant difference in distance between Lukobe Kambi Tano and Lukobe Juu Streets (P = 0.581). This indicates that households in both streets face similar challenges in accessing water, often having to walk long distances to reach water sources.

**Table 4: Difference in Distance from home to Water Source between Streets (n=120)**

| Compared street | | Mean Difference | Std. Error | P-value | 95% Confidence Interval | |
|---|---|---|---|---|---|---|
| | | | | | Lower Bound | Upper Bound |
| Lukobe Kambi Tano | Lukobe Juu | -115.143 | 208.014 | 0.581 | -527.10 | 296.81 |
| | Mgudeni | 989.250 | 190.283 | 0.000 | 612.40 | 1366.09 |
| Lukobe Juu | Lukobe Kambi Tano | 115.143 | 208.014 | 0.581 | -296.81 | 527.10 |
| | Mgudeni | 1104.393 | 200.890 | 0.000 | 706.54 | 1502.24 |
| Mgudeni | Lukobe Kambi Tano | -989.250 | 190.283 | 0.000 | -1366.09 | -612.40 |
| | Lukobe Juu | -1104.393 | 200.890 | 0.000 | -1502.24 | -706.54 |

*The mean difference is significant at the 0.05 level

### 3.5 Responses on Time Spent Travelling to and from Water Sources

The results presented in Table 5 illustrate the responses of male and female participants regarding the time spent travelling to and from water sources. The data indicate that 60.0% of male respondents from Lukobe Juu Street reported spending less than 60 minutes fetching water. This relatively shorter duration may be attributed to factors such as the use of bicycles, motorbikes, or other means of transportation. In contrast, 43.8% of male respondents indicated spending between 60 and 90 minutes, while 12.5% reported spending more than 90 minutes on average to fetch water at Mgudeni Street. These findings suggest that the time burden associated with water collection varies not only by location but also by access to transport and proximity to water points. However, these results appear to contradict findings reported by Mdende (2009), who noted that during the dry season, women spent an average of 375 to 508 minutes per day fetching water, whereas men spent approximately 25 to 150 minutes. Similarly, Juma et al. (2018) observed that women and girls often dedicate a significant portion of their time to travelling long distances in search of water. This lived reality is further illustrated by the following qualitative account:

> “We spend much time on fetching water during the dry season—almost one hour and a half—because our wells have low water levels. Hence, many household members wait in long queues, especially in the morning and evening hours.” (FGD participant, Lukobe Kambi Tano Street, 14th February 2020).

The participant's account underscores the compounded effects of water scarcity and queuing delays during peak collection times, further intensifying the burden on households, particularly during the dry season.

**Table 5: Time spent for Fetching Water by Households (n=120)**

| Group compared | Water collected Time (Minutes) | Lukobe Kambi Tano | Lukobe Juu | Mgudeni |
|---|---|---|---|---|
| Male | 00 | 3(21.4) | 1(6.7) | 0(0) |
| | Less than 60 | 6(42.9) | 9(60.0) | 7(43.8) |
| | 60 to 90 | 5(35.7) | 4(26.7) | 7(43.8) |
| | More than 90 | 0(0) | 1(6.7) | 2(12.5) |
| Female | 00 | 3(11.5) | 2(11.1) | 0(0) |
| | Less than 60 | 10(38.5) | 6(33.3) | 18(58.1) |
| | 60 to 90 | 12(46.2) | 8(44.4) | 13(41.9) |
| | More than 90 | 1(3.8) | 2(11.1) | 0(0) |

Note: Numbers in brackets are percentages

Accessibility to water supply and sanitation facilities must be ensured within or in the immediate vicinity of each household, educational institution, workplace, and public space (Juma et al., 2018; NAWAPO, 2002). According to these standards, the time spent to fetch 20 litres of water—including waiting time should not exceed 30 minutes, and the round-trip distance to a water source should be less than one kilometre. Water is considered inaccessible if it requires travelling more than one kilometre or if the time spent exceeds 30 minutes. The findings of this study align with those of Tereza (2011), who reported that in Ethiopia, many people regularly travel more than one kilometre to access unprotected and unimproved water sources. Such findings suggest that both distance and time spent accessing water are partial indicators of the burden of domestic water collection, particularly for women and young girls in Tanzania.

### 3.6 Respondents' Perceptions on the Performance of Alternative Water Sources

The results presented in Table 6 reflect respondents' perceptions of the performance of alternative water sources at the household level. Findings indicate that more than half of the respondents (55% and 67.8%) disagreed with the statement that water from shallow wells and vendors was sufficient to meet their domestic needs. This suggests that these sources do not adequately meet household water requirements for daily use. Conversely, 54.2% of respondents agreed that water obtained from private sources, such as neighbours, was sufficient to meet their daily domestic needs. Moreover, a substantial majority (95.4%) agreed that long distances to water points negatively affect the performance of other economic activities. These findings are consistent with a study by Saladi and Salehe (2017) conducted in Kabuku-Ndani, Tanzania, which reported that although the distance to water sources was under one kilometre, it often exceeded 400 metres—still contributing to time loss and reduced productivity.

In addition, 95.3% of respondents disagreed with the statement that their community recognises the importance of managing and protecting wells. This indicates a lack of community awareness or formal structures for the stewardship of local water resources. Furthermore, 76.7% of respondents disagreed with the claim that there is no relationship between household size and the availability of alternative water sources. This result supports Tereza's (2011) findings that household size significantly influences water usage and demand; thus, as household size increases, so does water demand. The following quotes highlight these findings:

> "We have two public shallow wells in our street. The wells were constructed by the households themselves to meet daily water needs. So, it is the responsibility of the community to protect them. I have served as a street leader since 2019, but I have never seen any document outlining how to manage and protect groundwater sources…" (Key informant, Lukobe Kambi Tano Street, 13th February 2020)

In the same vein, another respondent noted:

> "…We appreciate the individuals who provide water to local vendors in our street. However, our local leadership lacks coordination in the construction and maintenance of public wells…" (Key informant, Mgudeni Street, 15th February 2020)

**Table 6: Perceptions on the Performance of Alternative Water Sources at Household Level (n=120)**

| Statements | Disagree | Neutral | Agree |
|---|---|---|---|
| Do you think Water from shallow wells is sufficient to meet the domestic needs | 66(55) | 0(0) | 54(45) |
| Do you think buying water from vendors is sufficient to meet the domestic needs | 81(67.8) | 0(0) | 39(32.2) |
| Do you think buying water from private sources (neighbour's) is sufficient to meet the domestic needs | 55(45.8) | 0(0) | 65(54.2) |
| Does community recognize the importance of the management and protection of wells | 4(95.3) | 2(1.3) | 114(3.4) |
| Does walking Long distance to water points delays other economic activities | 4(3.4) | 1(1.2) | 115(95.4) |
| Is there any relationship between alternative water sources access and households' size | 19(15.8) | 9(7.5) | 92(76.7) |

Note: Numbers in brackets are percentages

## 4. Conclusion and Recommendations

Based on the results and discussion, the researchers conclude that the target set by the National Water Policy (NAWAPO, 2002) of ensuring access to water within 400 metres of domestic water points has not yet been achieved in Lukobe Ward. Findings indicate that the majority of respondents walk an average of 633.45 metres from their homes to water sources, with the distance typically ranging between 400 and 1000 metres. This clearly contradicts the policy guideline, which recommends that access to water should be within 400 metres. Although the policy is widely known among communities in Tanzania, including those in the study area, the findings demonstrate that water access in Lukobe Ward remains inadequate in terms of proximity. Therefore, the researchers conclude that water points in the study area are not easily accessible, particularly in relation to the distance required to fetch water. Drawing from the findings and conclusion, the following recommendations are proposed:

(i) Given that the National Water Policy (2002) defines accessible water as a water point serving 250 persons within a 400-metre radius—and this standard has not been met in Lukobe Ward—there is a need for urgent intervention.

(ii) The Morogoro Municipal Council, through the local government authority, should strengthen collaboration with key stakeholders, including financial institutions such as large commercial banks and state-owned banks, to create an enabling environment for financing water and sanitation projects in water-scarce communities.

(iii) The local government authority should also empower communities in Lukobe Ward by providing education and awareness programmes on sustainable management and protection of water resources such as shallow wells. This would enhance community ownership and ensure the long-term sustainability of water sources.

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**Declaration of Conflict of Interest**

The author declares that no competing interests exist.

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