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Coping Strategies for Unreliable Domestic Water Supply in Ubungo Municipal Council, Tanzania

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Abstract
Despite ongoing government efforts to improve water service delivery, unreliable domestic water supply continues to affect many households in Ubungo Municipal Council, Tanzania. This study examined household coping strategies for unreliable domestic water supply in the municipality. A convergent parallel mixed-methods research design was adopted. Simple random sampling was used to select 397 household heads for the household survey, while purposive sampling selected 10 key informants for in-depth interviews and 17 participants for focus group discussions. Data were collected through household questionnaires, in-depth interviews, and focus group discussions. Quantitative data were analysed using descriptive and inferential statistics in IBM SPSS Statistics Version 20, whereas qualitative data were analysed through qualitative content analysis using NVivo Version 12. The findings indicate that the most common coping strategies were adjusting household water consumption (67%), harvesting rainwater during the wet season (58%), and expanding water storage capacity (53%). Multinomial logistic regression analysis revealed that household size, income, sex of the household head, education level, and the availability of storage facilities and space significantly ($p < 0.05$) influenced the choice of coping strategies. The study concludes that unreliable domestic water supply is driven by infrastructure, management, demand, and financial constraints. Households respond by adopting multiple coping strategies, with their choices shaped by socio-economic factors. The study recommends that the Dar es Salaam Water Supply and Sanitation Authority (DAWASA) and local government authorities strengthen water supply infrastructure, improve system management, and support households in adopting sustainable strategies for managing water shortages.

Introduction

Access to reliable urban domestic water supply is essential for public health, socio-economic wellbeing, and sustainable urban development (Collins et al., 2024). However, many cities worldwide experience unreliable water supply due to rapid urbanisation, increasing demand, and climate variability (Phiri & Velmurugan, 2024). As a result, households face frequent supply interruptions and adopt various coping strategies to secure water for daily needs (Odwori, 2021).

In Africa, rapid urban growth has increased pressure on limited water infrastructure and service delivery systems (Bose et al., 2024). Although many urban water utilities struggle to expand

production capacity, maintain distribution networks, and provide regular water services to rapidly growing urban populations, the challenge remains. Households respond to these situations by adopting various coping strategies, including storing water in household containers and tanks, purchasing water from private vendors, and harvesting rainwater. While these strategies help households to manage short-term shortages, they often involve additional financial costs.

In Tanzania, reliable urban domestic water supply remains a challenge despite government efforts to improve water service delivery (Kabote, 2024). Urban population growth and limited capacity of water supply infrastructure have contributed to persistent water supply interruptions. Under these conditions, households frequently rely on alternative water sources and adopt various coping mechanisms to maintain access to water. Previous studies (Mwamanga & Tao, 2023; Salehe, 2024) have identified common coping strategies; however, limited attention has been given to factors influencing households' choice of specific strategies. As a result, there remains a gap in understanding why households select specific coping methods under conditions of water scarcity.

The Ubungo Municipal Council in Dar es Salaam experiences a persistently unreliable domestic water supply despite investments in infrastructure development and network expansion. Understanding how households respond to unreliable urban domestic water supply is important for informing effective water management policies and improving urban water service delivery. Therefore, this study seeks to examine household coping strategies for unreliable domestic water supply in Ubungo Municipal Council, Tanzania. Specifically, the study aims to identify the coping strategies adopted by households and to analyse the factors influencing their choice in the context of an unreliable water supply.

Theoretical Framework

This study is guided by the Sustainable Livelihoods Framework (SLF) developed by DFID (1999). The framework explains how households respond to livelihood stresses by using available assets and adopting coping strategies (Backer & Rogers, 1998). In this study, an unreliable domestic water supply is considered a livelihood stressor that prompts households to adopt strategies such as adjusting water use and harvesting rainwater. The choice of coping strategies is influenced by various socio-economic factors, including household income, age, education, and access to storage facilities.

Methodology

The study was conducted in Ubungo Municipal Council, and specifically in Kimara and Mabibo Wards. The Council is located between latitudes $6^{0}42'00''$ and $6^{0}55'00''$ south of the Equator, and between longitudes $39^{0}04'00''$ and $39^{0}15'00''$ east of Greenwich Meridian. The area is characterised by high population density, growing water demand, and frequent interruptions in piped water supply. These features make Ubungo Municipal Council an ideal setting for exploring variations in water supply conditions and the coping strategies.

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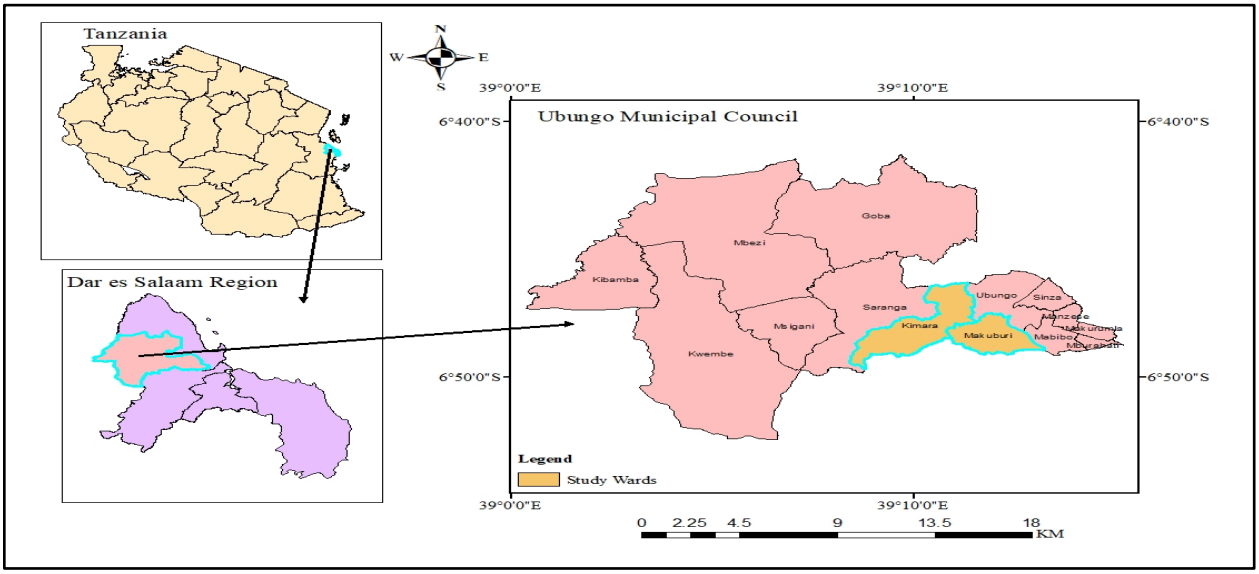

Figure 1: Location of the Study Area

Source: Field data, 2025

This study employed a convergent parallel mixed-methods research design (Guetterman et al., 2015) to examine household coping strategies in response to unreliable water supply in Ubungo Municipal Council, Tanzania. Quantitative and qualitative data were collected concurrently, analysed independently, and integrated during interpretation. Combining both data types improved comparison of findings and gave a clearer understanding of how households deal with water shortages. The study population consisted of households (53,155) connected to DAWASA (The United Republic of Tanzania, 2022). It also included government officials from DAWASA, as well as from Kimara and Mabibo wards. These groups were the stakeholders in water supply services and were central to the study. The study used a sample size of 397 respondents that was determined by Yamane's (1967) formula, and given as: $n = \frac{N}{1+N(e)^2}$

Where n = sample size, N = population size and e = the level of precision (5%).

Therefore $n = \frac{\mathbf{53,155}}{1+\mathbf{53,155}(0.05)^2}$ =

$$n = \frac{53,155}{1 + 53,155(0.0025)} = 397\ respondents$$

The proportional allocation formula by Kothari (2004) was used to determine the number of respondents for the study wards. The formula is expressed as: $ni = \frac{Ni}{N} x\ n$

Where *ni* represents the sample size for the i^{th} ward, *Ni* is the population of the i^{th} ward, *N* is the total population of all selected wards, and *n* is the overall sample size for the study (Table 1).

Table 1: Population and sample size for the study

Wards	**Population**	**Households**	**Sample ($ni = \frac{Ni}{N} x\ n$)**	**(%)**
Kimara	96,995	28,017	209	53
Mabibo	74,887	25,138	188	47
Total	**171,882**	**53,155**	**397**	**100**

Source: The United Republic of Tanzania, 2022

In this study, purposive sampling was used to select Kimara and Mabibo wards from the 14 wards in Ubungo Municipal Council. These wards were selected because of their high population and persistent challenges with unreliable water supply. The technique was also employed to select four (4) streets, including Mabibo and Jitegemee streets in Mabibo ward, and Kilungule A and Kilungule B streets in Kimara ward. The streets were selected based on high population, frequent water shortages, and household complaints about inadequate water supply. Additionally, 10 key informants and 17 focus group discussion participants were purposively selected for their knowledge and experience in urban water service provision. Key informants included DAWASA officials, local government officers, and community water stakeholders, while focus group participants were household members affected by unreliable water supply. The number of key informants and focus group discussion participants was sufficient, as data saturation was reached; subsequent interviews and discussions did not generate new themes or significant information. Finally, a simple random sampling technique was used to select 397 household heads from the sampled wards.

Both primary and secondary data were collected in February 2026. The household heads, DAWASA officials, ward/streets leaders, and local water vendors were the sources of primary data. Published and unpublished documents were sources of secondary data. The primary data on household coping strategies to unreliable water supply were collected through in-depth interviews of key informants, focus group discussions and a household questionnaire survey. The questionnaire was pretested with 20 respondents (5% of the sample) in a similar area outside the study site to assess its clarity, validity, and reliability. Content validity was ensured through expert review, while reliability was assessed using Cronbach's alpha coefficient. Feedback from the pre-test was used to refine the instrument before the actual data collection. Qualitative data from key informant interviews and focus group discussions were analysed using qualitative content analysis with NVivo Version 12. The analysis involved coding, categorisation, and theme development on household coping strategies during water supply disruptions. The quantitative data collected through a household questionnaire survey were analysed using descriptive statistics and a multinomial logistic regression model in IBM SPSS Statistics version 20. The model was used to examine the factors influencing households' choice of coping strategies in response to unreliable urban domestic water supply. The model was stated as:
$Y=\beta_0+ \beta_1 (Hs) + \beta_2 (In) + \beta_3 (Sex) + \beta_4 (Ed) + \beta_5 (Sf) \quad +.....\beta_Z.$

Where Y = Household choice of coping strategies to unreliable domestic water supply, B_0 = Constant, B_1-B_z = Coefficients of the explanatory variables, Hs = Household size, In = Income, Sex = Sex of the household head, Ed = Education level of household heads, and Sf = Storage facilities.

Additionally, in this model, the dependent variable was the household's choice of coping strategies for an unreliable domestic water supply (Y). The independent variables of the model were the factors influencing households' choice of coping strategies in response to unreliable urban domestic water supply (Table 2).

Table 2: Independent Variables Used in the Multinomial Logistic Regression Model

Independent variables	**Coding**
Household size	Actual number of household members
Income	Actual income amount in Tsh.
Sex of the household head	0 = Female, 1 = Male
Educational levels	0 = Primary or below, 1 =Secondary & above
Storage facilities and space	0 = Not available, 1 = Available

Source: Field data, 2025

Ethical Considerations

Ethical principles were observed throughout the study. Research permission was obtained from the Mwalimu Nyerere Memorial Academy in the Dar es Salaam Region and the Ubungo Municipal authorities. Confidentiality and anonymity were maintained by removing participants' identifying information. The collected data were used only for academic purposes.

Demographic Characteristics of the Respondents

Table 3 shows that 58% of respondents were over 40 years old, suggesting greater experience in coping with an unreliable water supply. Additionally, 62% had secondary education or above, indicating better knowledge of water management and coping strategies. Other characteristics, including household size, sex, income, and ward of residence, are presented in Table 3.

Table 3: Demographic Characteristics of the Respondents

Variables	**Categories**	**Total N=397** (%)
Age of the household head	≤ 40 years	42
	> 40 years	58
Household size	≤ 3 Members	36
	> 3 Members	64
Education level	≤ Primary	38
	≥ Secondary	62
Sex of the household head	Female	53
	Male	47
Income of the household	Low (≤ Tsh.324,937)	52
	High (>Tsh.324,937)	48
Wards of residence	Mabibo	47
	Kimara	53

Source: Survey data, 2026

Respondents' perceptions regarding the causes of unreliable water supply services across wards

The findings in Table 4 indicate that 48% of the respondents perceived insufficient water sources as a cause of unreliable water supply services. The chi-square test results indicate a statistically significant difference between wards in this perception ($\chi^2 = 4.465$, $p = 0.035$). This difference suggests that Mabibo ward experiences greater pressure on available water sources or faces more limited access to reliable water sources than Kimara ward. The results from in-depth interviews with key informants show that the unreliability of water supply in Dar Es Salaam is influenced more by the reliance on the Ruvu River as a main source of water supply. One of the key informants reported:

The major cause of unreliable water supply in Dar es Salaam is the dependence on a single main source, the Ruvu River. The river becomes severely depleted during the dry season, leading to widespread water shortages across the Dar es Salaam region. As a result, households rely on limited stored water, and overall access to water becomes highly constrained, with significant variation across socio-economic groups (Key informant, 40 years old in Mabibo ward).

Table 4: Respondents' perceptions regarding the causes of unreliable water supply services

Causes	Perceptions	Ward of Residence		Total	χ^2
		Mabibo	Kimara		*P*- Value
		%	%	%	
Insufficient water sources	Not perceived	47	57	52	4.465**
	Perceived	53	43	48	0.035
Faulty infrastructure	Not perceived	17	12	14	1.675
	Perceived	83	88	86	0.196
High water demand exceeding supply capacity	Not perceived	30	28	29	0.117
	Perceived	70	72	71	0.733
Inadequate infrastructure maintenance	Not perceived	52	30	40	20.756**
	Perceived	48	70	60	0.000
Lack of technical expertise	Not perceived	58	47	52	4.877**
	Perceived	42	53	48	0.027
Inefficient water distribution management	Not perceived	37	35	36	0.072
	Perceived	63	65	64	0.788
Seasonal weather variations	Not perceived	45	34	40	4.796**
	Perceived	55	66	60	0.029
Inadequate financial resources	Not perceived	31	26	28	1.228
	Perceived	69	74	72	0.268
Inadequate prioritisation of water supply services	Not perceived	60	47	53	6.391**
	Perceived	40	53	47	0.011

***Significant at 5%*
Key: χ^2 *= Pearson Chi-Square*
Source: Survey data, 2026

The results further show that 86% of respondents perceived faulty infrastructure as a cause of unreliable water supply services. However, the chi-square test revealed no statistically significant difference in perceptions between the two wards ($\chi^2 = 1.675$, $p = 0.196$). The findings suggest that infrastructure problems such as damaged pipes, leakages, and ageing water systems are common challenges affecting both wards.

The findings revealed that 71% of respondents perceived high water demand exceeding supply capacity as a cause of unreliable water supply services. The chi-square test results indicate no statistically significant difference in perceptions between Mabibo and Kimara wards ($\chi^2 = 0.117$, $p = 0.733$). The similarity indicates that population growth and increased domestic water needs affect both wards. According to Razon (2025), the water supply shortage in the Philippines was associated with population growth, which increased water demand beyond supply capacity.

The findings also show that 60% of respondents perceived inadequate infrastructure maintenance as a cause of unreliable water supply services. The chi-square test revealed a statistically significant difference in perceptions between the two wards ($\chi^2 = 20.756$, $p = 0.000$). This difference implies that Kimara ward experiences more frequent infrastructure failures and inadequate maintenance services than Mabibo ward. Similar findings were reported by Iorlumun & Idoko (2026) that inadequate infrastructure maintenance in Makurdi Town, Nigeria caused unreliable water supply services.

Furthermore, 48% of respondents perceived a lack of technical expertise as a cause of unreliable water supply services. The chi-square test results show that there was a statistically significant difference regarding these perceptions between wards ($\chi^2 = 4.877$, $p = 0.027$). The variation might instead reflect differences in community awareness, expectations of service standards, or the visibility/frequency of maintenance teams operating in Kimara compared to Mabibo.

The results further indicate that 64% of respondents perceived inefficient water distribution management as a cause of unreliable water supply services. However, the chi-square test showed no statistically significant difference in perceptions between Mabibo and Kimara wards ($\chi^2 = 0.072$, $p = 0.788$). The findings imply that problems related to water allocation, scheduling, or distribution management are experienced in both wards. Venkataramanan et al. (2020) reported that water management failures contribute to the unreliable water supply services in Sub-Saharan Africa.

The study also found that 60% of respondents perceived seasonal weather variations as a cause of unreliable water supply services. The chi-square test results revealed a statistically significant difference in perceptions between wards ($\chi^2 = 4.796$, $p = 0.029$). This difference indicate that Kimara ward is more vulnerable to climatic changes affecting water availability. These findings corroborate those of Kabote (2024) who reported that seasonal weather variations had contributed to unreliable water supply services in Morogoro municipality, Tanzania.

In addition, 72% of respondents perceived inadequate financial resources as a cause of unreliable water supply services. Nevertheless, the chi-square test results showed no statistically significant difference in perceptions between Mabibo and Kimara wards ($\chi^2 = 1.228$, $p = 0.268$). The findings suggest that insufficient funding for infrastructure development, maintenance, and water service management is a common challenge in both wards.

The findings indicate that 47% of respondents perceived inadequate prioritisation of water supply services as a cause of unreliable water supply. The chi-square test results revealed a statistically significant difference regarding these perceptions between Mabibo and Kimara wards ($\chi^2 = 6.391$, $p = 0.011$). This difference suggests that Kimara residents were more concerned about the attention and priority given to water supply services by responsible authorities. In contrast, the lower proportion in Mabibo indicates that residents see water supply problems as more related to technical or environmental factors than to weak institutional prioritisation.

The coping strategies to unreliable water supply services

The findings in Table 5 show that 69% of respondents practised expansion of water storage capacity as a coping strategy for water scarcity. The Chi-square test revealed that the expansion of water storage capacity was significantly associated with respondents' sex ($\chi^2 = 8.947$, $p = 0.003$). This suggests that males are more likely than females to increase water storage capacity as a means of coping with water shortages. This difference could be attributed to variations in access to resources and the ability to invest in water storage facilities. However, Achore and Bisung (2023) reported that women, compared to men, were more likely to use water storage as a coping strategy for water scarcity in urban areas of Ghana.

Table 5: The coping strategies to unreliable water supply

Coping strategies	Practices	Sex of Respondents		Total	χ^2 *P*- Value
		Females	Males		
		%	%	%	
Expansion of water storage capacity	Not practiced	37	23	31	8.947**
	Practiced	63	77	69	0.003
Purchasing water from vendors	Not practiced	48	52	50	0.725
	Practiced	52	48	50	0.394
Rainwater harvesting in the wet season	Not practiced	35	51	42	9.688**
	Practiced	65	49	58	0.002
Adjusting household water use	Not practiced	26	40	33	9.123**
	Practiced	74	60	67	0.003
Use of well and borehole water	Not practiced	61	65	63	0.626
	Practiced	39	35	37	0.429
Borrowing water from neighbours	Not practiced	68	67	68	0.046
	Practiced	32	33	32	0.825
Reusing water	Not practiced	57	53	55	0.679
	Practiced	43	47	45	0.410

***Significant at 5%*
Key: χ^2 *= Pearson Chi-Square*
Source: Survey data, 2026

In contrast, equal proportions of males (50%) and females (50%) were found among those who practised purchasing water from vendors and those who did not. The Chi-square test indicates that purchasing water from vendors was not significantly associated with sex ($\chi^2 = 0.725$, $p = 0.394$). According to Nchor & Ukam (2024), both male- and female-headed households relied on purchasing water from vendors during periods of severe water shortages.

Additionally, the findings revealed that 58% of respondents practised rainwater harvesting during the wet season. The Chi-square test revealed that rainwater harvesting during the wet season was statistically significantly associated with sex ($\chi^2 = 9.688$, $p = 0.002$). The results imply that women are more actively involved in collecting and storing rainwater for future household use. This is because women are culturally tasked with domestic chores like cooking, washing, and childcare; they are forced to actively seek out secondary environmental options, such as rainwater harvesting, to cushion the household when the municipal grid fails. These findings agree those of Banda et al. (2023) who documented that most of households in Lusaka, Zambia were harvesting rainwater during rainy season as a strategy to cope with water shortage.

The findings further show that 67% of respondents practised adjusting household water use. The Chi-square test shows that the practice of adjusting household water use was significantly associated with respondents' sex ($\chi^2 = 9.123$, $p = 0.003$). This finding indicates that women are more likely to implement water conservation measures within households during periods of water scarcity. The results from the focus group discussions revealed that most participants employed a range of coping strategies during periods of unreliable water supply. These strategies included expanding water storage capacity, purchasing water from vendors, harvesting rainwater during the wet season, adjusting household water consumption patterns, and borrowing water from neighbours. One of the participants stated:

When the water supply becomes unreliable, we are forced to find alternative ways to cope. Sometimes we store more water, buy water from vendors, or borrow from neighbours so that our daily activities can continue (Male household head, 48 years in Mabibo ward).

Likewise, only 37% of respondents reported practising the use of well and borehole water. The Chi-square test revealed that the use of well and borehole water was not statistically significantly associated with respondents' sex ($\chi^2 = 0.626$, $p = 0.429$). The absence of a significant difference suggests that access to alternative groundwater sources is similar between male and female respondents.

Borrowing water from neighbours was among the least practised coping strategies, with only 32% of respondents reporting its use. The Chi-square test revealed that borrowing water from neighbours was not significantly related to respondents' sex ($\chi^2 = 0.046$, $p = 0.825$). This indicates that neighbourly support networks are utilised equally by both sexes during water shortages. The findings from the focus group discussions revealed that borrowing water from neighbours was a common coping strategy during periods of water deficiency. Participants explained that households often relied on nearby neighbours when they ran out of stored water. This practice was facilitated by mutual trust and strong social ties within the community. One of the participants explained:

Borrowing water from neighbours is very common in this area. If someone has stored enough water, they willingly share it, knowing that one day they may also need help from others (Female Participant, 40 years in Kimara Ward).

Furthermore, 45% of respondents reported reusing water as a coping mechanism. According to the chi-square test, reusing water did not differ significantly by sex ($\chi^2 = 0.679$, $p = 0.410$). This suggests that water reuse practices are adopted similarly by both men and women. According to Achore et al. (2020), households used a variety of coping strategies to cope with unreliable water supply, including reusing water and borrowing water from neighbours. Under the theme of *water reuse* as a coping strategy, key informants revealed that households reused water from activities such as washing clothes, bathing, and cleaning utensils for other domestic purposes, including floor cleaning, toilet flushing, and gardening. One of the key informants explained:

Many households do not throw away water after washing clothes or bathing. They collect it in buckets and use it again for cleaning the floor or flushing the toilet. This helps them save water because they do not know when the next supply will come (Key Informant, 53 years old in Mabibo ward).

Factors influencing the choice of coping strategies to unreliable water supply

In this section, the results from a multinomial logistic regression model examining the factors influencing the choice of coping strategies in response to unreliable water supply service are presented. The model fitting information in Table 6 indicates that the intercept-only model contains no predictor variables, whereas the final model includes all explanatory variables. The reduction in the -2 Log Likelihood value from 968.179 to 734.083 indicates improvement in model fit after inclusion of the predictors.

Table 6: Model Fitting information

Model	-2 Log likelihood	Chi-square	df	Sig
Intercept-Only	968.179			
Final	734.083	234.096	20	.000

Source: Survey data, 2026

The likelihood ratio Chi-square value of 234.096, with p = .000, indicates that the final model is statistically significant. This means that the independent variables significantly influenced households' choice of coping strategies.

The household size of the respondents (Table 7) had a statistically significant influence on the choice of expanding water storage capacity (Exp (B) = 1.298, 95% CI: 1.016 - 1.657, p = 0. 037), purchasing water from vendors (Exp (B) = 1.624, 95% CI: 1.272 - 2.074, p = 0.000), harvesting rainwater during wet season (Exp (B) = 1.516, 95% CI: 1.234 - 1.862, p = 0.000), and adjusting water consumption (Exp (B) = 1.246, 95% CI: 1.025 - 1.513, p = 0. 027). These results suggest that each additional household member increased the odds of adopting these strategies by approximately 30%, 62%, 52%, and 25%, respectively. These results show that households with more members had greater water demand and were therefore more likely to adopt multiple measures to cope with water scarcity. The findings corroborate those from the focus group discussions that during periods of water scarcity, households with larger family sizes tend to store water in tanks, reduce non-essential uses, and harvest rainwater to cope with the situation. One of the participants of the FGD said:

In fact, households with large families suffer more during water shortages. For example, my family has seven members, all of whom need water for bathing, washing clothes, and cooking. When water becomes scarce, we reduce some non-essential uses such as frequent bathing and washing clothes. We also harvest rainwater, store water in containers whenever it is available, and reuse water, such as using water from washing clothes to irrigate vegetables and flowers (Female household head, 55 years in Kimara ward).

Table 7: Factors influencing the choice of coping strategies to unreliable water supply

Coping strategies		B	Std. Error	Wald	df	Sig.	Exp(B)	95% Confidence Interval for Exp(B)	
								Lower Bound	Upper Bound
Expansion of water storage	Intercept	-.580	.885	.430	1	.512			
	Hs	.261	.125	4.358	1	.037	1.298	1.016	1.657
	In	.365	.132	7.682	1	.006	1.441	1.113	1.866
	[Sex =.00]	-2.611	.526	24.681	1	.000	.073	.026	.206
	[Sex =1.00]	0[b]	.	.	0	.	.	.	.
	[Ed =.00]	-1.802	.528	11.631	1	.001	.165	.059	.465
	[Ed =1.00]	0[b]	.	.	0	.	.	.	.
	[Sf =.00]	-2.075	.519	16.014	1	.000	.126	.045	.347
	[Sf =1.00]	0[b]	.	.	0	.	.	.	.
Purchasing water from Vendors	Intercept	-2.559	.944	7.350	1	.007			
	Hs	.485	.125	15.121	1	.000	1.624	1.272	2.074
	In	.047	.144	.105	1	.746	1.048	.790	1.389
	[Sex =.00]	-.312	.448	.485	1	.486	.732	.304	1.762
	[Sex =1.00]	0[b]	.	.	0	.	.	.	.
	[Ed =.00]	.025	.443	.003	1	.955	1.026	.430	2.445
	[Ed =1.00]	0[b]	.	.	0	.	.	.	.
	[Sf =.00]	-1.798	.545	10.871	1	.001	.166	.057	.482
	[Sf =1.00]	0[b]	.	.	0	.	.	.	.
Rainwater harvesting in the wet season	Intercept	-1.007	.770	1.710	1	.191			
	Hs	.416	.105	15.695	1	.000	1.516	1.234	1.862
	In	-.100	.125	.636	1	.425	.905	.708	1.156
	[Sex =.00]	.018	.384	.002	1	.962	1.018	.480	2.162
	[Sex =1.00]	0[b]	.	.	0	.	.	.	.
	[Ed =.00]	-.035	.376	.009	1	.926	.965	.462	2.017
	[Ed =1.00]	0[b]	.	.	0	.	.	.	.
	[Sf =.00]	-1.475	.410	12.916	1	.000	.229	.102	.511
	[Sf =1.00]	0[b]	.	.	0	.	.	.	.
Adjusting water use	Intercept	-1.326	.737	3.237	1	.072			
	Hs	.220	.099	4.901	1	.027	1.246	1.025	1.513
	In	.070	.113	.377	1	.539	1.072	.858	1.339
	[Sex =.00]	.599	.380	2.485	1	.115	1.820	.864	3.830
	[Sex =1.00]	0[b]	.	.	0	.	.	.	.
	[Ed =.00]	.048	.358	.018	1	.894	1.049	.521	2.114
	[Ed =1.00]	0[b]	.	.	0	.	.	.	.
	[Sf =.00]	.694	.355	3.824	1	.051	2.001	.998	4.012
	[Sf =1.00]	0[b]	.	.	0	.	.	.	.

Key: *Sex = Sex of the household head, Ed = Education level of household head, Hs = Household size, Sf = Storage facilities, and In = Income.*

Significant at 5%. The reference category is: Other strategies such as use of well and borehole water, reusing water, and borrowing water from neighbours.

Source: Survey data, 2026.

Income had a statistically significant influence on the choice to expand water storage capacity (Exp (B) = 1.441, 95% CI: 1.113 - 1.866, p = 0. 006). The results suggest that households with higher income had 44% higher odds of expanding water storage capacity than households with lower income. Furthermore, these findings suggest that income primarily affected investments requiring financial resources, such as expanding water storage infrastructure, but had little influence on behavioural coping responses. According to Abubakar (2018), households with high income were more likely to

cope with unreliable water supply with more expensive strategies such as digging a borehole and installing overhead storage tanks compared to poor households.

The results from the in-depth interviews with key informants revealed that household income influenced the ability of households to invest in additional water storage facilities. Key informants explained that higher income households were more likely to purchase large storage tanks and construct permanent storage facilities to store water during periods of reliable supply. In contrast, low-income households often relied on a few small buckets or containers because of financial constraints. One of the key informants explained:

Income makes a big difference. Families with sufficient financial resources can prepare for water shortages by installing storage tanks, while those with limited income struggle to purchase even basic storage containers (Key Informant, 44 years old in Mabibo Ward).

The sex of the household head had a statistically significant influence on the choice of expansion of water storage capacity (Exp (B) = 0.073, 95% CI: 0.026 -0.206, p = 0.000). These results suggest that female-headed households had 93% lower odds of choosing expansion of water storage capacity as a coping strategy compared with male-headed households. This difference may be due to gender disparities in access to financial resources, ownership of productive assets, and decision-making power, which affect households' ability to invest in higher-cost water storage technologies. These results are consistent with Nastiti et al. (2017), who reported that female-headed households face greater constraints in coping with unreliable water supply and rely on low-cost coping mechanisms.

Results in Table 7 indicate that education level had a statistically significant influence on the choice of expansion of water storage capacity (Exp (B) = 0. 165, 95% CI: 0.059 - 0.465, p = 0.001). These findings implied that the odds of expanding water storage for households with primary or below primary education were 84% lower than for those with secondary or above secondary education. These results suggest that higher educational attainment facilitated the adoption of infrastructure-related coping strategies such as installing storage tanks to expand water storage compared with other strategies. Odwori (2021), found that better-educated families are more likely to adopt capital-intensive coping strategies, such as installing water storage tanks, due to greater knowledge and planning capacity for long-term water security options.

The storage facilities and space had a statistically significant negative influence on the choice of expansion of water storage capacity (Exp (B) = 0. 126, 95% CI: 0.045 - 0.347, p = 0.000), purchasing water from vendors (Exp (B) = 0. 166, 95% CI: 0.057 - 0.482, p = 0.001), and rainwater harvesting (Exp (B) = 0. 229, 95% CI: 0.102 - 0.511, p = 0.000). These results suggest that households with limited storage facilities and space were approximately 87%, 83%, and 77% less likely, respectively, to adopt these coping strategies than households with adequate storage facilities and space.

Conclusion

The study concludes that unreliable domestic water supply in Ubungo Municipal Council is driven by infrastructural, managerial, demand-related, and household level constraints. Households respond by adjusting water use, harvesting rainwater, purchasing water, and expanding storage capacity. The choice of strategies is influenced by income, household size, sex, education level, and availability of water storage facilities. The study contributes to knowledge of household coping strategies in the face of an unreliable water supply. The study recommends that DAWASA and local government authorities strengthen maintenance of water infrastructure, expand access to affordable storage facilities, and promote water conservation practices to improve household resilience to water shortages.

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