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SUSTAINABILITY ANALYSIS OF COMMUNITY-BASED RURAL WATER SUPPLY INITIATIVES IN KWARA STATE, NIGERIA

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Abstract: *Rural communities' economic growth relies heavily on the consistent and sustainable provision of water services, which enhances residents' quality of life and drives agricultural wealth generation. Unfortunately, there is a troubling trend of borehole schemes deteriorating, being abandoned, or underperforming after being transferred to these communities. This issue poses a serious obstacle to rural development and impedes progress toward Sustainable Development Goal six. To investigate this, a study assessed the sustainability of community-based rural water supply initiatives across three local government areas in Kwara State: Moro, Asa, and Ifelodun. The research utilized water quality testing, multi-criteria analysis approach and descriptive statistical tools, gathering data from 1,215 randomly selected respondents through questionnaires, field observations, and an evaluation of 61 borehole schemes. Key findings highlighted several sustainability challenges, including unwillingness to fund operation and maintenance, lack of cost recovery mechanism, unreliable electricity supply, high cost of fueling, malfunctioning generators; limited access to spare parts; and inadequate accountability and transparency within maintenance committees. Additional barriers included low education levels, the absence of water pricing mechanisms, and limited commitment to routine upkeep. The study ultimately found that 79% of the borehole schemes were unsustainable due to poor management practices, while only 21% demonstrated partial sustainability.*

Keywords: *Sustainability, water quality, Borehole scheme, Functional*

1.0 Introduction

Water is essential to all life on Earth and has been declared a fundamental human right (Balazs et al., 2021). However, millions globally still lack access to safe drinking water. According to data from the United Nations International Children’s Emergency Fund (UNICEF) and the World Health Organization (WHO), around 875 million people were without basic drinking water services by 2017, with the majority in developing and underdeveloped regions (UNICEF; WHO, 2019). The COVID-19 pandemic highlighted the urgent need for universal access to clean water and hand hygiene facilities. Recognizing this, the United Nations incorporated water-focused targets within the Sustainable Development Goals (SDGs) in the 2030 Agenda, with Goal 6 emphasizing the sustainable management and accessibility of water and sanitation for all. Access to water is crucial for effective sanitation and hygiene, aiming to reduce inequalities in these areas.

Providing reliable water supplies to rural regions is thus a key priority for policymakers, who must balance stakeholder interests and promote equity and sustainability. Water infrastructure, with its many components, plays a vital role in achieving these goals, yet ensuring sustainability in rural water systems remains a complex challenge (Toan et al., 2023). In this study, "sustainability" refers to the capacity of water supply systems to operate over the long term and effectively meet user needs. This research focused on assessing the sustainability of community-managed rural water supply systems in selected local government areas of Kwara State. The study aimed to identify and rank the factors affecting sustainability, evaluate field-level sustainability for each factor, calculate weighted scores, determine overall sustainability levels, and classify the sustainability status of these systems across the study area.

2.0 Materials and Method

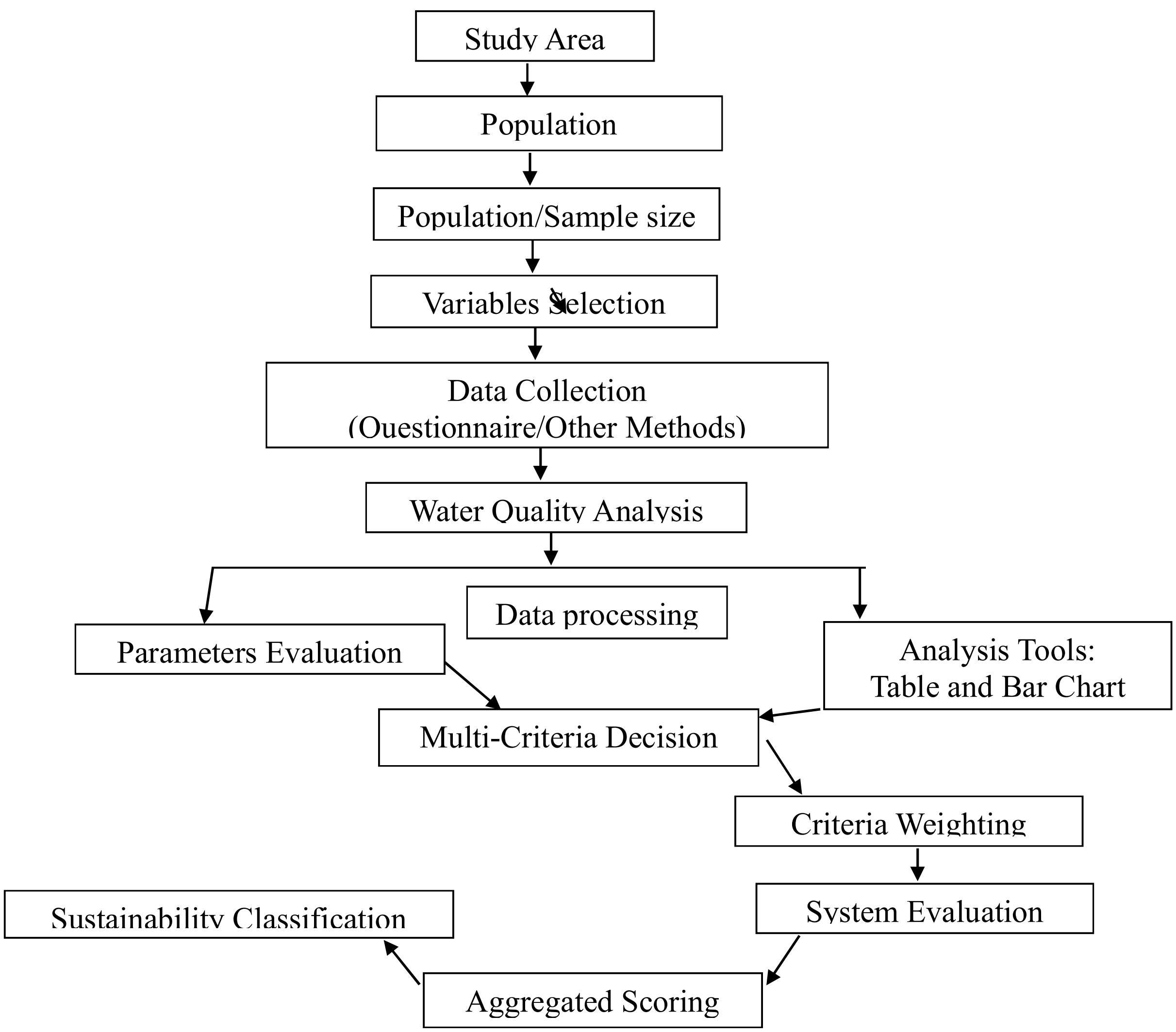
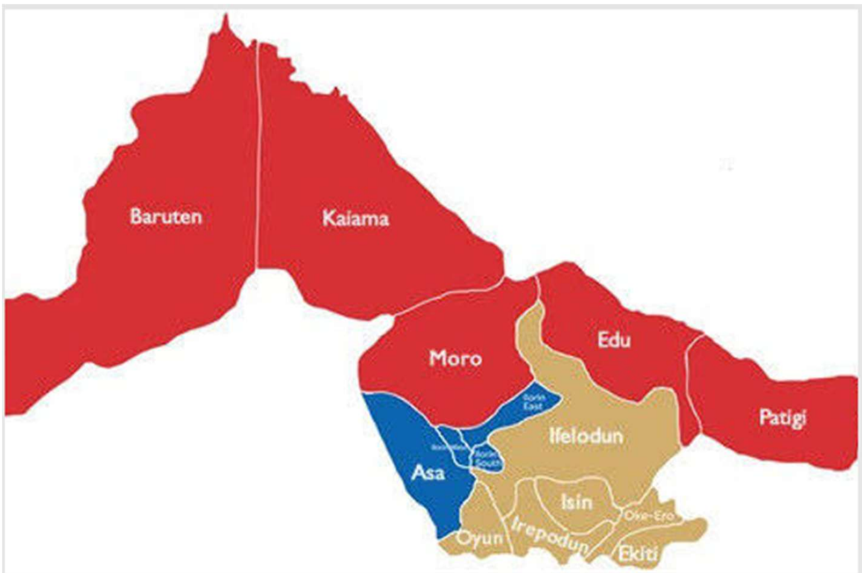


Figure 2.1 Methodological flowchart

2.1 Study area

Kwara State, Nigeria, was established on August 27, 1967, and lies between latitudes 8.5°N and 9.5°N and longitudes 3.5°E and 5.5°E. The state comprises of sixteen local government areas, including Moro, Asa, and Ifelodun, each with unique economic activities. Moro is characterized by its focus on farming, trading, and artisanal work; Asa is known for fishing, agriculture, and craftsmanship; and Ifelodun's economy centers on farming, trading, and civil service roles. The state has a population of approximately 2.5 million people, with Yoruba as the predominant language and ethnic group, and also includes Fulani, Nupe, and Baruba communities. The state capital, Ilorin, showcases Kwara's steady modernization and urban development as its economy continues to grow.



(Source: Goggle)

2.2 Projected Population and Expected Respondents in the Study Area.

The population figures recorded during the 1991 census for each community within the study area were as follows: Moro Local Government includes Okutala and neighboring villages had a population of 1,250, Jodoma community recorded 350, Sumela community 218 inhabitants, Agbogurin and Other neighboring had 336 and Jokolu community had 852 residents. Also in Asa Local Government covers the following communities with their population as at 1991 Ogbondoroko community 1,260, Reke community 183, Ago community 158, Budo Agun Oja community 121 and Laduba community 1, 221, and lastly in Ifelodun Local Government, the study considered Amoyo community 2,440, Jimba Oja community 687, Idofian community 5,519 and Karba Owode community 336.

Using a 3.2% annual growth rate, these figures were projected to estimate the 2024 population, as detailed in Tables 1, 2, and 3, employing the Population Growth Formula.

$$P = P_0 \text{ x } (1 + \frac{R}{100})^n$$ (Equation 1)

P= Total population after n years
P_o = Starting population
R =% rate of growth= 3.2%
n= Time in years= 33 years

The study used Equation 2, as cited from Kinyanjui *et al*. (2016), to determine the optimal number of questionnaires for distribution in each community. This formula helped calculate the necessary sample size for interviewing respondents, ensuring alignment with the study's objectives.

$$n = \frac{N}{[1+N(\alpha^2)]}$$ (Equation. 2)

Where, n is the appropriate sample size, N is the present population of the community and α is the acceptable error margin (10%)

Table 1: Questionnaire Distribution and Number of Water Schemes in Moro Local Government

Community	1991 Population Census	2024 Projected Population	Sample Size Distributed	Water Scheme
Okutala	1,250	3,537	97	4
Jodoma	350	990	91	4
Sumela	218	617	86	4
Agbogurin	336	951	90	4
Jokolu	852	2,411	96	7
Total	**4,006**	**8,506**	**460**	**23**

Table 2: Questionnaire Distribution and Number of Water Schemes in Asa Local Government

Community	1991 Population Census	2024 Projected Population	Sample Size Distributed	Water Scheme
Ogbondoroko	1,260	3,565	97	5
Reke	183	518	84	4
Ago	158	447	77	3
Budo Agun Oja	121	342	77	2
Laduba	1, 221	3,455	97	4
Total	**2,943**	**8,327**	**432**	**18**

Table 3: Questionnaire Distribution and Number of Water Schemes in Ifelodun Local Government

Community	1991 Population Census	2024 Projected Population	Sample Size Distributed	Water Scheme
Amoyo	2,440	6,905	99	4
Jimba Oja	687	1944	95	5
Idofian	5,519	15,619	99	5
Karba Owode	336	951	90	1
Omupo	6,411	18,143	99	8
Total	**15,393**	**43,562**	**482**	**23**

2.3 Data Analysis Method

The study used the Multi-Criteria Analysis (MCA) method, adapted from Panthi et al. (2008) and Petros et al. (2013), to evaluate the sustainability of community-based rural water supply initiatives in selected local government areas in Kwara State. The MCA approach involved the following steps:

1. Criteria Weighting: This initial step assigned relative importance values, or weights, to specific criteria based on their influence on sustainability. Weights were determined through expert judgment and stakeholder consultation to emphasize factors that significantly impact the water schemes' sustainability. In this study, financial and technical factors each received a weight of 30%, while social/environmental and institutional factors were each assigned 20%.

2. System Evaluation: At each project site, sub-factors were rated on a six-point scale for each water scheme: excellent (80-100%), very good (70-79%), good (50-69%), fair (30-49%), poor (<30%), and zero for non-existent factors. These scores reflect the scheme's performance and condition relative to each criterion.

3. Weighted Scoring: Each criterion score was multiplied by its weight to produce a weighted score for each scheme. Summing these weighted scores gave an overall sustainability score, representing the water scheme's comprehensive sustainability performance.

4. Sustainability Classification: Based on the aggregated score, each water scheme was classified into sustainability categories. Scores below 30% indicated unsustainable schemes, scores between 30% and 70% indicated partial sustainability, and scores above 70% indicated sustainable schemes.

Table 1: Criteria, Sub-Criteria, and Weighting Scheme for Sustainability Scoring

Criteria	Sub-Criteria	Weighting Scheme
A.1 Technical (0.3)	C.1.1 Build Quality	0.04
	C.1.2. Source Water Quality	0.035
	C.1.3. Scheme Complexity	0.035
	C.1.4 Regular Maintenance	0.05
	A1.5 System Condition and Functionality	0.02
	C.1.6 Natural Disaster Contingency	0.02
	C.1.7 Spare Parts and Equipment Availability	0.015
	C.1.8 Water Quality Control System	0.015
	C.1.9 Technical Skills and Training	0.04
	C.1.10 Water Collection Time	0.01
	C.1.11Status of Addressing Increased Demand	0.02
A2. Social / Environmental (0.2)	C.2.1. Collaborative Relations and Conflict Resolution	0.03
	C.2.2. Equity& Inclusion (ethnic group)	0.03
	C.2.3.Vulnerability and Sufficient Protection	0.05
	C.2.4.Seasonality, Quality, and Quantity	0.06
	C. 2.5 Access to Alternative Water Sources	0.03
A3.Financial (0.3)	C.3.1. Creation of O&M Fund	0.03
	C.3..2 Consistent Tariff Payment / Payment Willingness	0.1
	C.3.3 Systematic Accounting	0.03
	C.3.4. Cost Recovery Mechanism	0.1
	C.3.5 Utilization of Savings/Surplus	0.04
A4. Institutional (0.2)	C.4.1.Establishment, Functioning, and Meetings of the Users' Committee	0.02
	C.4.2 Ownership of the Scheme and Its Activities	0.02
	C.4.3 Policy and Regulatory Framework	0.03
	C.4.4 Formation of a Maintenance Committee	0.02
	C.4.5 Operational Effectiveness	0.05
	C.4.6 Transparency and Accountability	0.02
	C.S4.7 External Assistance	0.04

3.0 Results and Discussion

3.1 Willingness to pay

This reluctance stems from the availability of alternative water sources, low income levels, and a lack of ownership. Many perceive the water schemes as government property, expecting the government to shoulder the responsibility for operational and maintenance costs. This attitude is closely linked to the early failure and abandonment of many local water schemes. These findings support Kertins *et al*. (2012), who highlighted that failure to cover operational and maintenance costs often leads to the collapse of water systems. Similarly, Kaliba *et al*. (2003) and other researchers emphasize that the sustainability of water supply systems depends on consumers' willingness to pay user charges that cover all associated costs.

Willingness to pay (WTP) is a crucial indicator of demand for improved services and their long-term viability. Elkanah (2020) also noted that communities' inability to collect sufficient funds for repairs can shorten the lifespan of water systems, with inadequate financing being a major contributor to poor maintenance and project failure. Toan *et al*. (2023) Also reported that financial assistance is key to ensuring a reliable and sustainable water supply, positioning Brazil's program as an effective model for using subsidies to enhance resilience and secure access to clean water in underserved communities. Gomes *et al*. (2014) found that financial support for both infrastructure and maintenance is crucial for making rainwater harvesting a reliable water source. The study revealed that subsidies significantly improve the program's effectiveness, offering a model for how targeted financial assistance can enhance water access and sustainability in rural regions. Kativhu *et al*., (2018) also noted that better alignment of CBM guidelines with practical realities, alongside enhanced training, monitoring, and funding, to ensure sustainable rural water management. Kwangware *et al*., (2014) suggested enhancement of community participation in decision-making and improving financial contributions and maintenance practices to ensure the lasting benefits of the projects. Marks *et al*., (2018) found that strong financial management and active community participation were essential, emphasizing that sustainability is best achieved through a combination of sound financial practices, local community involvement, and management strategies tailored to specific regional conditions. The reluctance to pay for improved water services stands in contrast to the findings of Sule *et al*. (2010) and Ayanshola *et al*. (2013), who found that consumers are generally willing to pay for better water supply. To address this issue, it is crucial to raise awareness and educate community members about misconceptions surrounding ownership, the economic benefits of a sustainable water supply, how tariffs will be utilized, and the importance of accountability and transparency in the payment process. Consistent tariff payments can help boost revenue generation, improve cost recovery, and enhance the overall functionality of the water schemes. Figures 3.1, 3.2, and 3.3 show that most community members in the study area are reluctant to pay for the operation, maintenance, and cost recovery of improved water supply systems

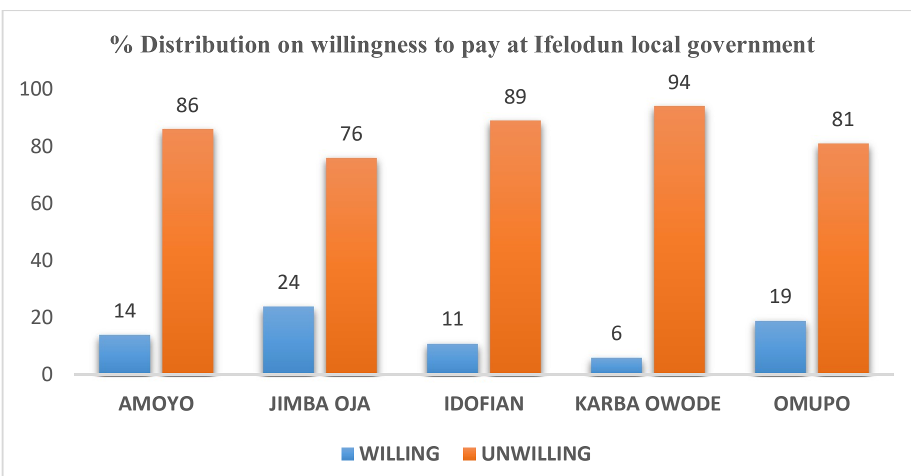


Figure 3.1 Respondents' Perspectives on Willingness to Pay

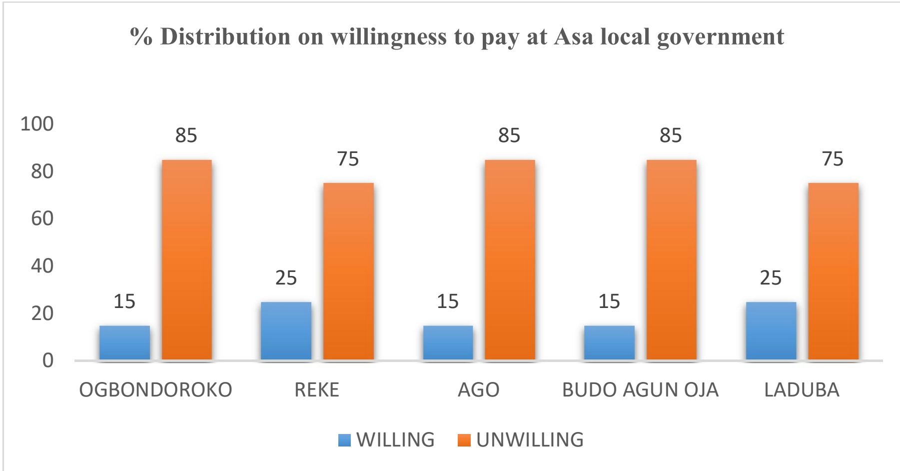


Figure 3.2. Respondents' Perspectives on Willingness to Pay

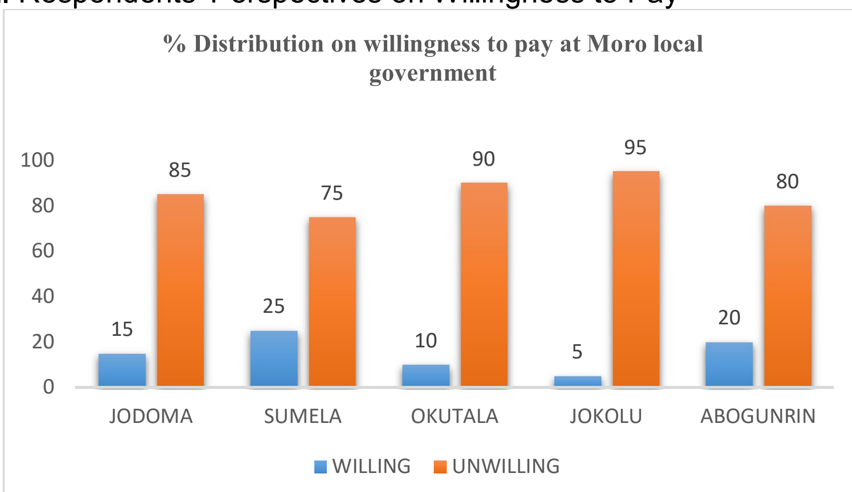


Figure 3.3 Respondents' Perspectives on Willingness to Pay

3.2 Frequency of maintenance

This delayed response contributed to the early failure of the schemes following their handover, undermining the expected benefits and wasting resources. Key factors contributing to this issue included the lack of skilled technicians on maintenance committees, ineffective committees, uncommitted user groups, and a shortage of spare parts. Communities often had to hire technicians from Ilorin, which incurred high logistical and maintenance costs, accelerating the failure of the water facilities. This finding aligns with Ademiluyi et al. (2008), who highlighted that a lack of community training can lead to the breakdown and unsustainability of water supply projects in developing countries. Similarly, Sanni et al. (2023) noted that poor coordination and a lack of maintenance culture have undermined rural water projects in Nigeria. Sara (2012) also emphasized that communities with proper training were more likely to maintain financially sustainable water systems and ensure the functionality of taps. To address the poor maintenance issue, solutions include providing ongoing training for community members, securing adequate funding for operation and maintenance, establishing local spare parts shops, and fostering stronger commitment from all water users to ensure the long-term functionality of the schemes. (Klug et al., 2017) . The study also outlined three management rehabilitation pathways, emphasizing that effective water system maintenance often involves a combination of local participation and external support. Key findings highlighted the importance of community training for addressing simple issues and ensuring accessible external support for more difficult repairs, suggesting that these approaches can improve the functionality and sustainability of water systems. (Kwangware et al., 2014). The study emphasizes the need for increased community participation in decision-making, enhanced financial contributions, and improved maintenance practices to ensure the lasting benefits of the projects. Survey results from Figures 3.4, 3.5, and 3.6 reveal that most communities did not engage in regular routine maintenance of water schemes, with maintenance committees typically addressing issues only after the facilities broke down.

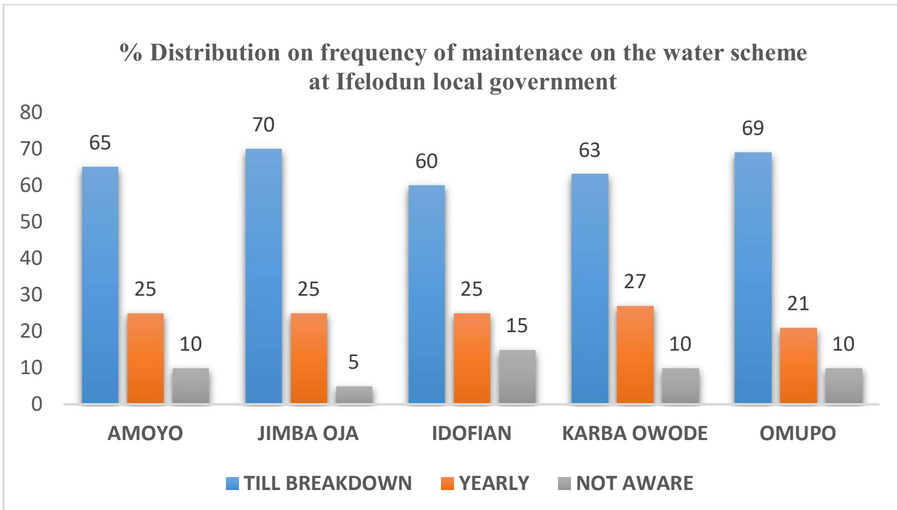


Figure 3.4 Respondent’s perspective on frequency water maintenance

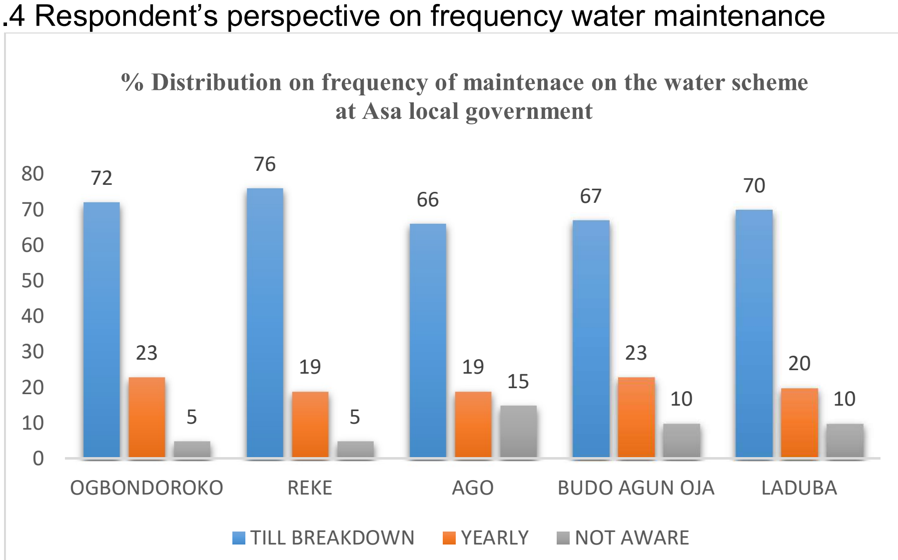


Figure 3.5 Respondent’s perspective on frequency water scheme maintenance

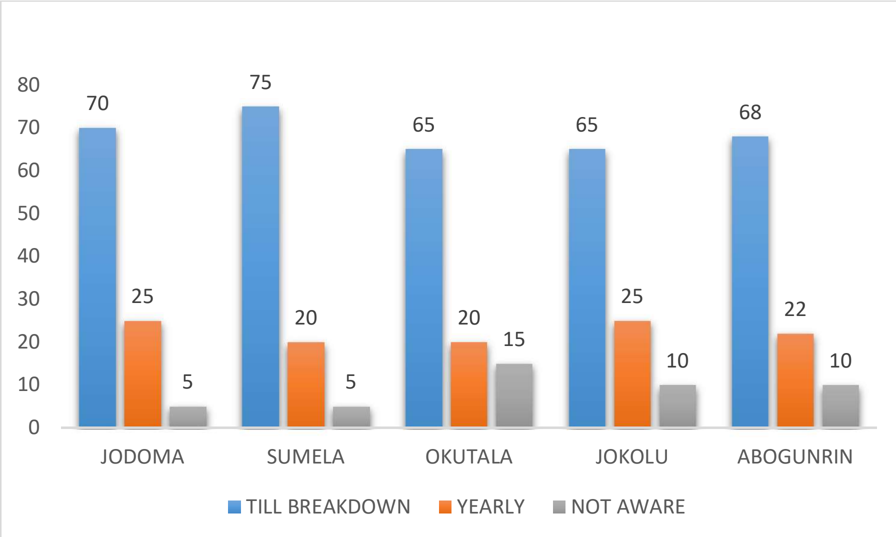


Figure 3.6 Respondent's perspective on frequency water scheme scheme maintenance

3.3 Water Sufficiency

This water scarcity forces residents to rely on unsafe sources, such as streams, ponds, and uncovered wells, exposing them to waterborne diseases like typhoid, hepatitis, cholera, and poor sanitation. This finding is consistent with Bipin et al. (2012), who noted that rural households without access to formal municipal services depend on rivers, streams, and springs, which are often contaminated by untreated sewage and industrial waste. It is estimated that 1.6 million people die annually from diarrheal diseases due to lack of access to safe water and sanitation. Furthermore, Sara et al. (2020) emphasized that contaminated water leads to waterborne diseases, particularly diarrhea, which is a leading cause of childhood mortality. This observation is also supported by Lebek et al. (2021), who found that water scarcity during the dry season can result in conflicts or even vandalism. Jepson (2014) similarly reported that rural communities lacking adequate water supply, both in terms of quality and quantity, face greater risks of disease, poverty, limited education, and reduced productivity. Long-term solutions to water scarcity include rehabilitating abandoned water schemes, constructing new ones where necessary, ensuring consistent funding for maintenance, and raising awareness about the importance of regular maintenance to sustain a reliable water supply. The data presented in Figures 3.7, 3.8, and 3.9 shows that most respondents in the communities experience inadequate and unreliable access to water for domestic use, with the situation worsening during the dry season.

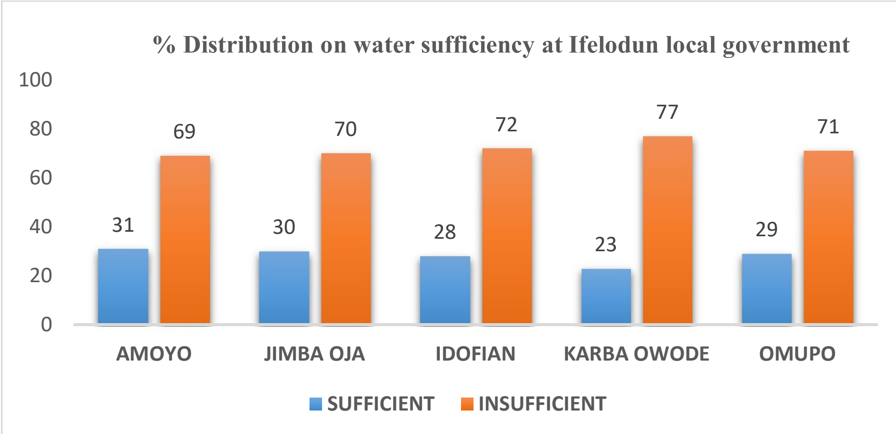


Figure 3.5 Respondent's perspectives at Ifelodun local Government on water sufficiency

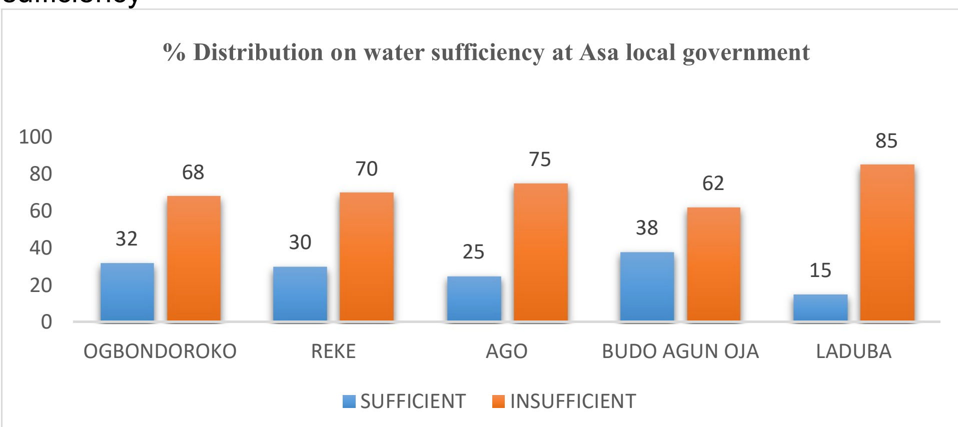


Figure 3.6 Respondent's perspectives at Asa local Government on water sufficiency

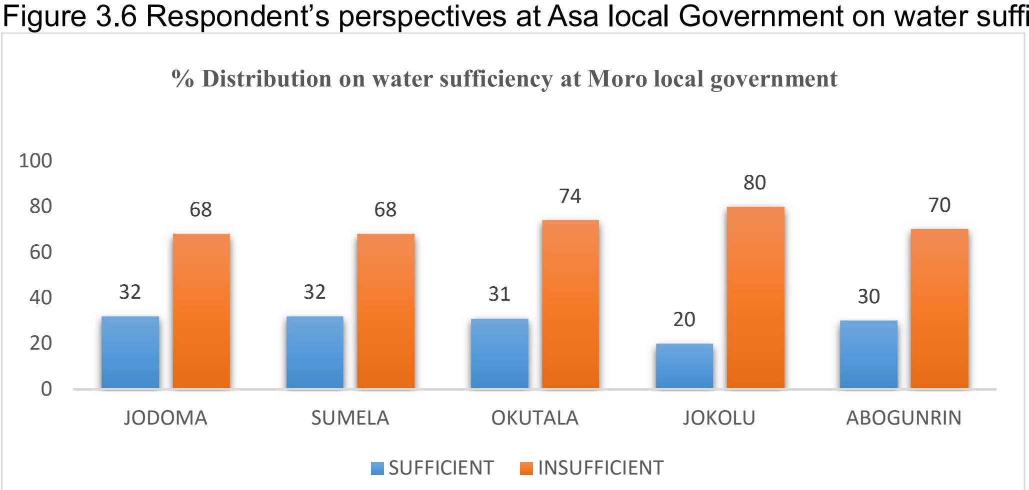


Figure 3.7 Respondent's perspectives at Moro local Government on water sufficiency

3.4 Contribution for maintenance

The contributions made by the communities were irregular and inadequate to cover the costs of spare parts, maintenance, and services required to restore the failed water schemes. While there is some willingness to contribute for minor repairs during the dry season when alternative water sources are depleted, this highlights a lack of commitment among many community members to fund ongoing operation and

maintenance. This lack of sustained financial support jeopardizes the long-term viability of water supply services, leading to their eventual failure. This finding aligns with DWAF (2004), which emphasized that for a rural water supply and sanitation scheme to be deemed sustainable, there must be a consistent effort to collect funds for operation and maintenance (O&M), major repairs, and management/administration costs. (Tadesse et al., 2013).The suggested enhancing community training, increasing external support, and improving sanitation to ensure the long-term safety and sustainability of water supply systems in the region.
(Kativhu et al., 2018) The study reported that Implementation of Community-Based Management (CBM). to improve training, monitoring, and funding to enhance the sustainability of rural water management. The data presented in Figures 3.8, 3.9, and 3.10 shows level of communities towards contributing to effectiveness of water scheme.

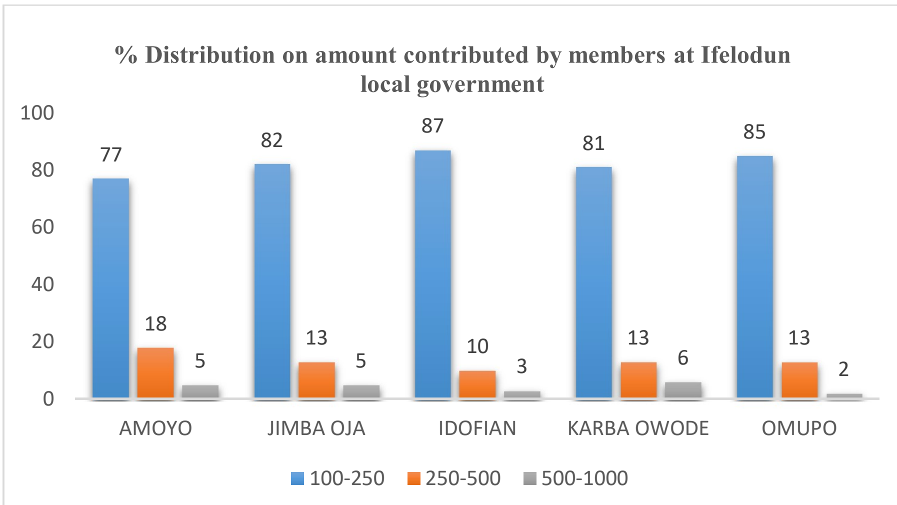


Figure 3.8 Respondent's perspectives at Ifelodun local Government on amount each member contributed

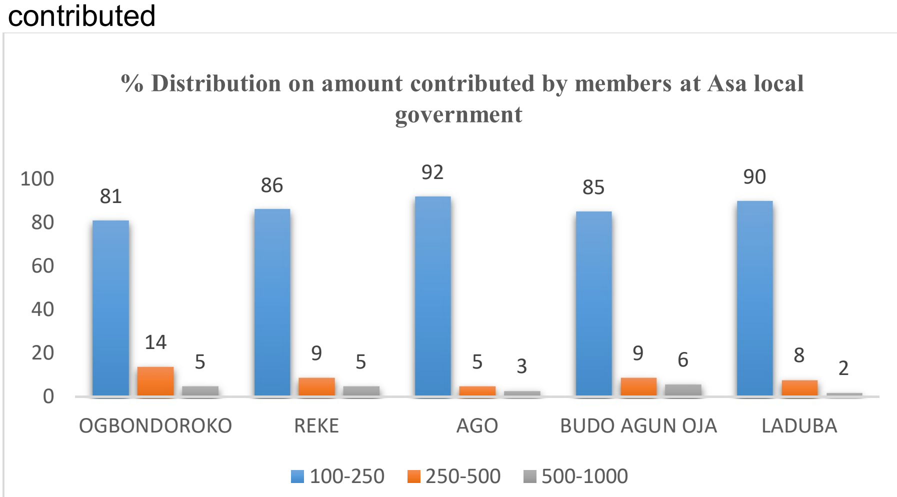


Figure 3.9 Respondent's perspectives at Asa local Government on amount each member contributed

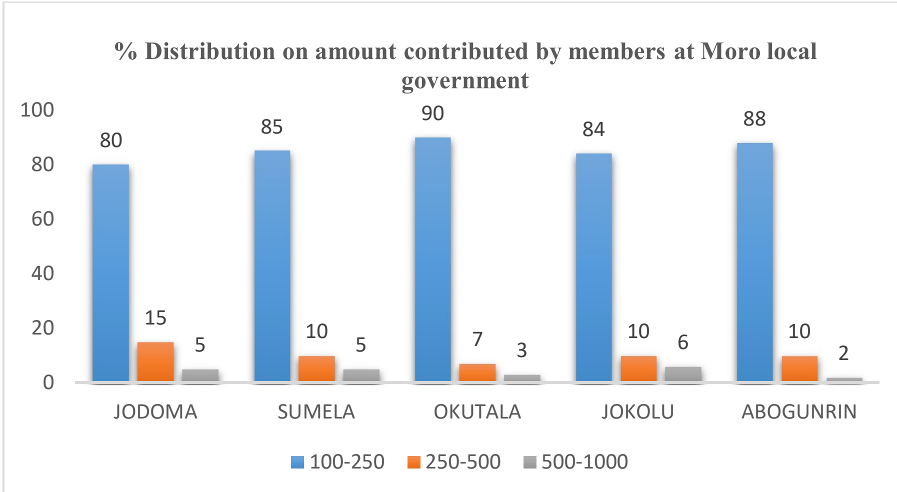


Figure 3.10 Respondent's perspectives Moro local Government on amount each member contributed

3.5 Education level

The field report presented in Figures 3.11, 3.12, and 3.13 indicates that the educational attainment of community members is linked to their exposure, reasoning abilities, administrative skills, perceptions of water scheme sustainability, and awareness of the risks associated with using unimproved water sources. The willingness to pay for improved water services has been shown to strongly correlate with literacy levels. According to Ayanshola et al. (2013), illiterate individuals generally exhibit a lower willingness to pay for better water supplies, while the majority of educated individuals are more inclined to pay. Similarly, Ifabiyi (2011) noted that households with higher education are more likely to pay for improved water services, and their education influences their ability to identify reliable water sources, assess water quality, and evaluate water source reliability. In essence, literacy directly impacts the willingness to pay, which in turn influences the functionality and sustainability of water services

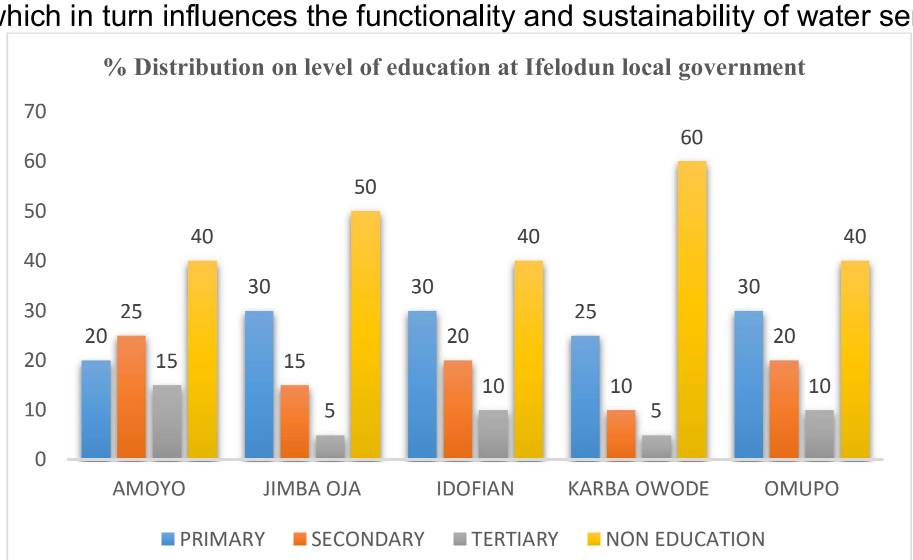


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Figure 3.11 Respondent's perspectives at Ifelodun local Government on level of Education

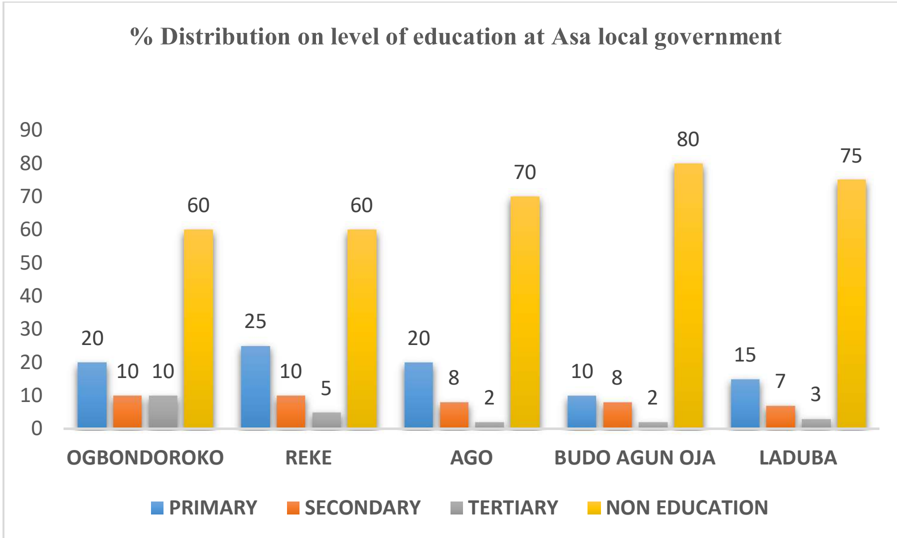

Figure 3.12 Respondent's perspectives at Asa local Government on level of Education

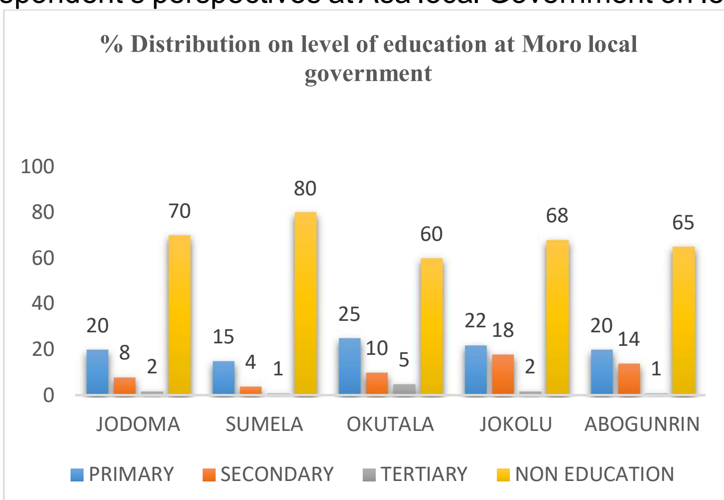

Figure 3.12 Respondent's perspectives at Moro local Government on level of Education

3.6 Condition of water scheme

The survey findings presented in Figures 3.13, 3.14, and 3.15 highlight that the majority of communities in the study area experience a high number of non-functional boreholes. This issue is largely due to a lack of understanding regarding sustainable management practices that could have enhanced the longevity and functionality of the water systems. To address the water shortage, it is essential to rehabilitate existing systems, establish an operation and maintenance fund, cultivate a willingness to pay for services, and provide the community with the necessary knowledge to operate, repair, and maintain the water supply infrastructure. These actions are key to ensuring the long-term sustainability of the water projects. (Marks et al., 2018)

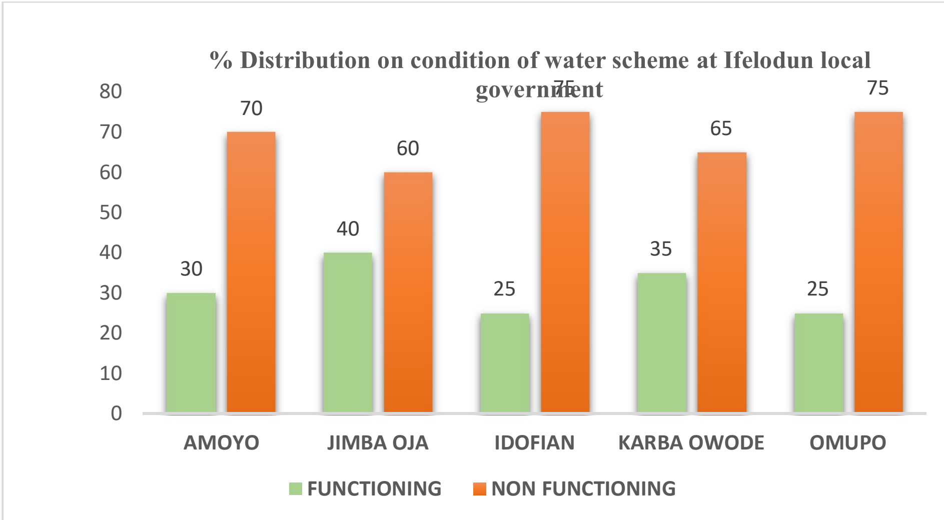

Figure 3.13 Respondent's perspectives at Ifelodun local Government on condition of water scheme

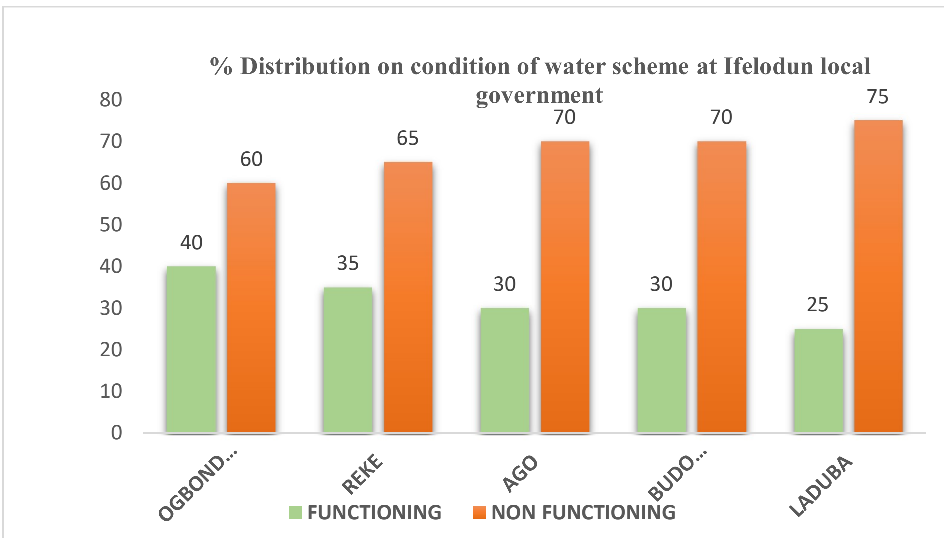

Figure 3.14 Respondent's perspectives at Asa local Government on condition of water scheme

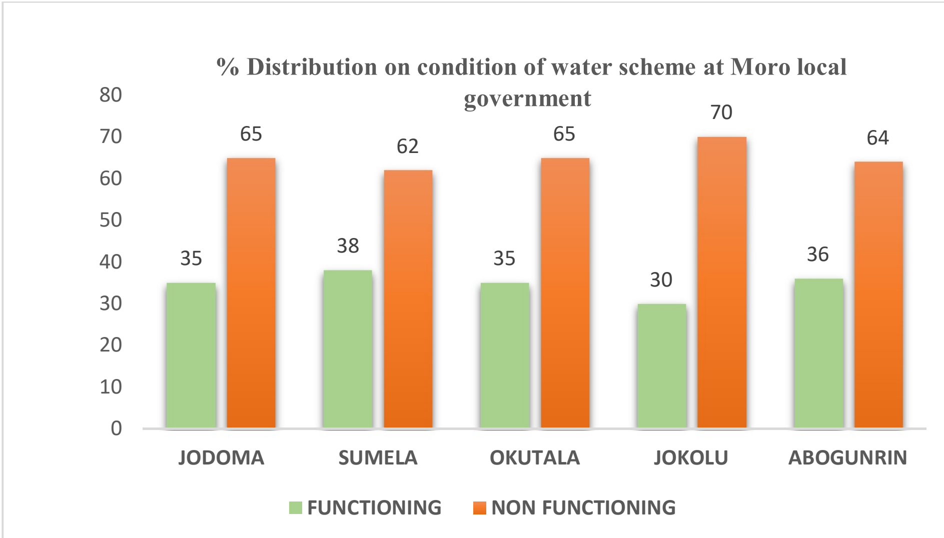

Figure 3.15 Respondent’s perspectives at Moro local Government on condition of water scheme

3.7 Water quality analysis

Water quality analysis of rural water schemes is crucial to ensure that the water provided to the community is safe, clean, and suitable for consumption. This analysis assesses various parameters that determine the physical, chemical, and biological characteristics of water, such as turbidity, pH, microbial contamination, and the presence of harmful substances like heavy metals or chemicals. In rural areas, where access to reliable and safe drinking water is often limited, conducting such analyses is essential for identifying potential health risks and ensuring the water meets national and international safety standards.

The analysis helps detect contamination issues that may arise from inadequate sanitation, improper storage, or natural factors like water source depletion. It also serves as a foundation for making informed decisions on improving water treatment processes, preventing waterborne diseases, and promoting better water management practices.

Regular monitoring and assessment of water quality ensure that communities have access to water that meets their daily needs while safeguarding health. Moreover, understanding the water quality in these schemes guides decisions on maintenance, treatment interventions, and long-term sustainability strategies to enhance the reliability of the water supply. Findings from various case studies indicate that most water parameters fell within acceptable limits, except for hardness, which was higher than recommended. Elevated water hardness can have negative effects on both health and infrastructure. While it does not pose a direct health risk, excessive hardness may contribute to issues like kidney stones and skin irritation. It can also lead to scale buildup in household appliances, reducing their efficiency and lifespan, which increases maintenance costs. Water utilities may also face higher treatment costs to soften the water, further straining resources. Addressing hardness is therefore vital to improve water quality, reduce costs, and protect public health. Figure 1 presents the results from selected water samples within the case studies.

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ANALYST'S CERTIFICATE

(In acordance with Institute of Public Analysts of Nigeria Decree No. 100 of 1992).

Certificate No. 24/JW/0252

To: JIMBA OJA WATER.

I J.A. OYEDEPO [FIPAN]

Registered number: 00115 **do hereby**

certify that on the 14TH SEPTEMBER , 2024 **a sample marked** BOREHOLE WATER

Batch number ______ **Quantity** 2 LITRES

was submitted to me by you as a sample of RAW WATER

for analysis. The said sample while in the condition as received by me was analysed / examined by me, or under my direction.

My findings are stated here under:

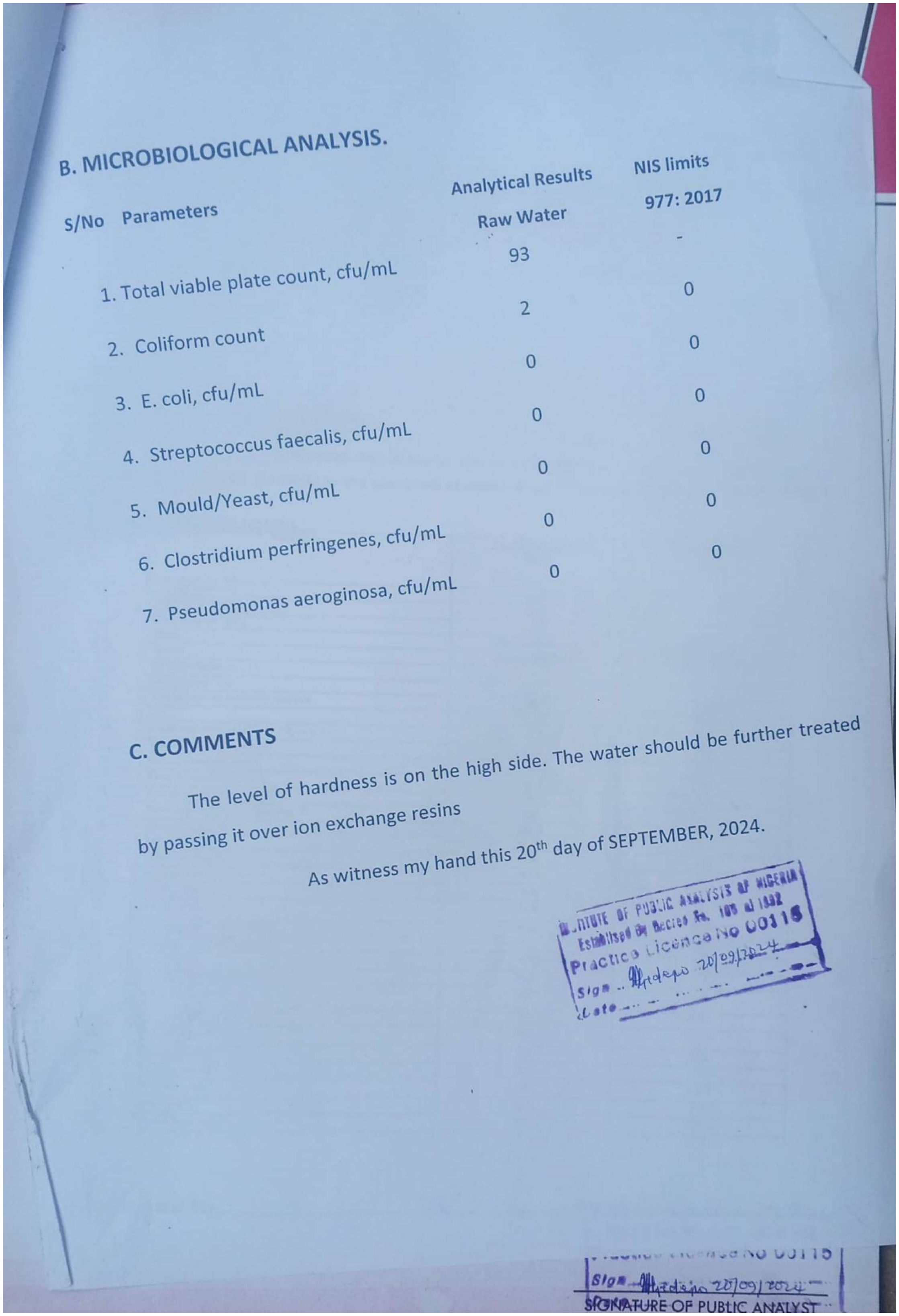
A. PHYSICO- CHEMICAL ANALYSIS.

S/No	Parameters	Analytical Results RAW	Permitted level [NIS] 977:2017
1	Temperature °C	25.4	-
2	Colour [Units]	0.9	3
3	Turbidity [N.T.U]	1.2	5
4	Taste	Unobjectionable	Unobjectionable
5	Odour	Unobjectionable	Unobjectionable
6	Declared content, cL	-	-
7	Net content, cL	-	-
8	Electrical conductivity, us/cm	249	1, 000
9	pH	6.15	6.5-8.5
10	Total dissolved solids, TDS, mg/L	143.4	500
11	Filterable solids, mg/L	16.9	500
12	Total hardness, mg/L	100	100
13	Total Alkalinity, mg/L	[illegible]	100
14	Residual chlorine, mg/L	NIL	0.2
15	Hydrogen sulphide, H_2S, mg/L	Nil	0.01
16	Chloride, mg/L	77.11	100
17	Sulphate, mg/L	23.22	100
18	Fluoride, mg/L	NIL	1.0
19	Nitrate, mg/L	7.63	10
20	Nitrite, mg/L	NIL	0.02
21	Sodium, mg/L	21.7	100
22	Manganese, Mn^{2+}, mg/L	NIL	0.1
23	Magnesium, Mg^{2+}, mg/L	2.1	2.0
24	Iron, mg/L	0.16	0.3
25	Copper, Cu^{2+}, mg/L	NIL	1.0
26	Lead, pb^{2+}, mg/L	Nil	0.01
27	Cyanide, CN, mg/L	Nil	0.01
28	Cadmium, mg/L	Nil	0.003
29	Arsenic, mg/L	Nil	0.01
30	Barium, mg/L	Nil	0.05
31	Mercury, mg/L	Nil	0.001
32	Zinc, mg/L	Nil	5.0
33	Chromium, mg/L	Nil	0.01

As witness my hand this 20th day of September 2024

INSTITUTE OF PUBLIC ANALYSTS OF NIGERIA
Practice Licence No 00115
Sign ______
Date 20/09/2024

SIGNATURE OF PUBLIC ANALYST



B. MICROBIOLOGICAL ANALYSIS.

S/No	Parameters	Analytical Results Raw Water	NIS limits 977: 2017
1.	Total viable plate count, cfu/mL	93	-
2.	Coliform count	2	0
3.	E. coli, cfu/mL	0	0
4.	Streptococcus faecalis, cfu/mL	0	0
5.	Mould/Yeast, cfu/mL	0	0
6.	Clostridium perfringenes, cfu/mL	0	0
7.	Pseudomonas aeroginosa, cfu/mL	0	0

C. COMMENTS

The level of hardness is on the high side. The water should be further treated by passing it over ion exchange resins

As witness my hand this 20th day of SEPTEMBER, 2024.

SIGNATURE OF PUBLIC ANALYST

3.8 Summary of sustainability scores for all the water schemes under study

Table 2 displays the sustainability scores for the water schemes evaluated. Out of the 63 boreholes assessed, 45 (75%) were categorized as unsustainable, while 18 (25%)

were deemed partially sustainable. Although some schemes remained operational, their sustainability was significantly compromised due to the use of unsustainable strategies by the communities managing these water systems. The high proportion of unsustainable projects poses a considerable threat to the long-term availability of water, access to safe drinking water, and the economic development of rural areas.

Figure 3.16 shows the condition of various water schemes within the study area.

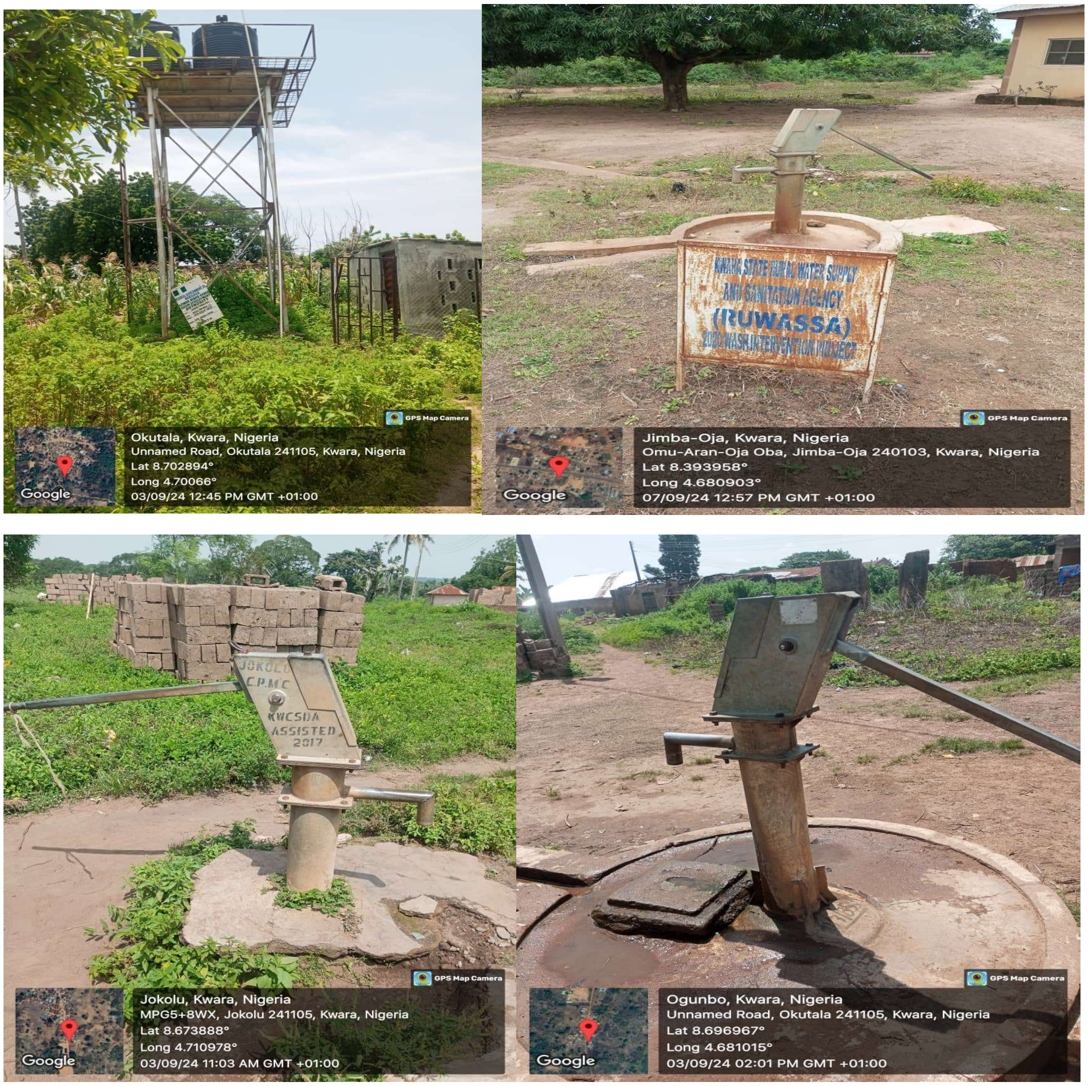


Figure: 3.16 Operational and unsustainable Motorized borehole and non-functional and across various communities within the study area.

Table 2: Overview of Sustainability Scores for All Water Schemes in the Case Studies

S/N	Project Name/ Number	Description	Project Scores	Categorization and Status
1	AMHB 1	Amoyo Hand Borehole 1	23.55	Not Sustainable & Non-Functional
2	AMHB 2	Amoyo Hand Borehole 2	17.1	Not Sustainable & Non-Functional
3	AMMR 1	Amoyo Motorized Borehole 1	21.54	Not Sustainable & Non-Functional
4	AMMR 2	Amoyo Motorized Borehole 2	23.73	Not Sustainable & Functional
5	JIHB 1	Jimba oja Hand Borehole 1	16.83	Not Sustainable &Non-Functional
6	JIHB2	Jimba oja Hand Borehole 2	24.45	Not Sustainable &Functional
7	JIMRB1	Jimba oja Motorized Borehole 1	31.56	Partially Sustainable & Functional
8	JIMRB2	Jimba oja Motorized Borehole 2	32.56	partially Sustainable & Functional
9	JIHB3	Jimba oja Hand Borehole 3	18.23	Not Sustainable & Non-Functional
11	IDMRB 1	Idofian Motorized Borehole 1	30.32	Partially Sustainable & Functional
12	IDMRB 2	Idofian Motorized Borehole 2	19.74	Not Sustainable & NonFunctional
13	IDMRB 3	Idofian Motorized Borehole 3	26.56	Not Sustainable &Functional
14	KAMRB 1	Kaba Owode Motorized Borehole 1	24.65	Not Sustainable & Functional
15	OMHB 1	Omupo Hand Borehole 1	10.34	Not Sustainable &Non-Functional
16	OMHB 2	Omupo Hand Borehole 2	16.45	Not Sustainable & Functional
17	OMHB 3	Omupo Hand Borehole 3	14.45	Not Sustainable &Non-Functional
18	OMHB 4	Omupo Hand Borehole 4	10.52	Not Sustainable &Non functional
19	OMHB 5	Omupo Hand Borehole 5	11.55	Not Sustainable &Non-Functional
20	OMHB 6	Omupo Hand Borehole 6	26.45	Not Sustainable &Functional

21	OMHB 7	Omupo Hand Borehole 7	12.58	Not Sustainable &Non-Functional
22	OMMRB 1	Omupo Motorized Borehole 1	19.44	Not Sustainable & Functional
23	OMMRB 2	Omupo Motorized Borehole 2	21.45	Not Sustainable & Functional
24	OGMRB 1	Ogbondoroko Motorized Borehole 1	16.25	Not Sustainable &Non-Functional
25	OGMRB 2	Ogbondoroko Motorized Borehole 2	14.9	Not Sustainable &Non-Functional
26	OGHB 1	Ogbondoroko Hand Borehole 1	18.56	Not Sustainable & Non-Functional
27	OGHB 2	Ogbondoroko Hand Borehole 2	17.46	Not Sustainable & Functional
28	OGHB 3	Ogbondoroko Hand Borehole 3	15.67	Not Sustainable & Non-Functional
29	REMRB 1	Reke Motorized Borehole 1	32.15	Partially Sustainable & Functional
30	REMRB 2	Reke Motorized Borehole 2	28.45	Not Sustainable &Non-Functional
31	REHB 1	Reke Hand Borehole 1	14.125	Not Sustainable &Non-Functional
32	REHB 2	Reke Hand Borehole 2	13.45	Not Sustainable &Non-Functional
33	AGHB 1	Ago oja Hand Borehole 1	12.34	Not Sustainable &Non-Functional
34	AGHB 2	Ago oja Hand Borehole 2	11.43	Not Sustainable &Non-Functional
35	AGMRB 1	Ago oja Motorized Borehole 1	21.21	Not Sustainable & Functional
36	AGMRB 2	Ago oja Motorized Borehole 2	18.23	Not Sustainable & Functional
37	BDAMRB1	Budo Agun oja Motorized Borehole 1	34.78	Partially Sustainable & Functional
38	BDAMRB 2	Budo Agun oja Motorized Borehole 2	19.43	Not Sustainable & Functional
39	LAMRB 1	Laduba Motorized Borehole 1	39.45	partially Sustainable & Functional
40	LAMRB 2	Laduba Motorized Borehole 2	36.72	partially Sustainable & Functional
41	LAMRB 3	Laduba Motorized Borehole 3	35.54	Partially Sustainable & Functional
42	LAHB 1	Laduba Hand Borehole 1	15.46	Not Sustainable &Non-Functional
43	JOMRB 1	Jokolu Motorized Borehole 1	27.54	Not Sustainable &Functional
44	JOHB1	Jokolu Hand Borehole 1	14.32	Not Sustainable &Non-Functional

45	JOHB2	Jokolu Hand Borehole 2	31.45	Partially Sustainable &Functional
46	JOHB3	Jokolu Hand Borehole 3	23.14	Not Sustainable &Non-Functional
47	OKMRB 1	Okutala Motorized Borehole 1		Partially Sustainable &Functional
48	OKMRB 2	Okutala Motorized Borehole 2	17.81	Not Sustainable & Non Functional
49	OKMRB 3	Okutala Motorized Borehole 3	25.74	Not Sustainable & Non-Functional
50	OKHB1	Okutala Hand Borehole 1	13.71	Not Sustainable & Non-Functional
51	SUMR1	Sumela Motorized Borehole 1	38.43	Partially Sustainable &Functional
52	SUHP1	Sumela Hand Borehole 1	13.56	Not Sustainable & Non-Functional
53	SUHP2	Sumela Hand Borehole 2	15.76	Not Sustainable &Non-Functional
54	SUHP3	Sumela Hand Borehole 3	18.2	Not Sustainable &Non-Functional
55	AGGM R1	Agbogurin Motorized Borehole 1	36.74	Partially Sustainable &Functional
56	AGGHP 1	Agbogurin Hand Borehole 1	14.22	Not Sustainable &Non-Functional
57	AGGHP 2	Agbogurin Hand Borehole 2	15.23	Not Sustainable &Non-Functional
58	JUMR1	Jodoma Motorized Borehole 1	32.54	Partially Sustainable &Non-Functional
59	JUHP1	Jodoma Hand Borehole 1	13.91	Not Sustainable &Non-Functional
60	JUHP2	Jodoma Hand Borehole 2	14.54	Not Sustainable &Non-Functional
61	JUHP3	Jodoma Hand Borehole 3	15.71	Not Sustainable &Non-Functional

4.0 Conclusion

The study assessed the sustainability of community-based rural water supply initiatives in selected local government areas of Kwara State. The findings revealed that a significant proportion of these schemes had low sustainability scores, underscoring their unsustainability and the high incidence of abandoned water projects in rural areas. While some schemes were still operational, only 21% were deemed partially sustainable, mainly due to their recent construction within the last two years. In contrast, 79% of the borehole schemes were categorized as unsustainable, primarily due to poor management strategies. The study also recommended implementing cost-effective water softening treatments and establishing regular water quality monitoring to address issues of hardness and contamination.

To improve sustainability, the study called for greater involvement from the government and development partners in providing training to community members on water project management prior to ownership transfer. Developing skills in operation, repair, and maintenance would enhance community capacity to manage these schemes effectively. Additionally, the study emphasized the importance of accountability and transparency in revenue collection by maintenance committees to foster community trust and support. Finally, it advocated for increased awareness campaigns to promote community participation and willingness to pay, which would improve revenue generation, facilitate cost recovery, and enhance overall service delivery. Engaging communities in maintenance and public health education, alongside collaboration with stakeholders for technical and financial support, was also recommended to ensure a sustainable water supply.

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