

ASSESSMENT OF WATER MANAGEMENT PRACTICES AMONG SELECTED ADULT RURAL DWELLERS IN TAKUM LOCAL GOVERNMENT AREA, TARABA STATE, NIGERIA

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ABSTRACT

The purpose of the study was to assess the water management practices among selected adult rural dwellers in Takum Local Government Area of Taraba State, Nigeria. In order to accomplish the purpose of the study, three specific objectives with corresponding research questions were formulated and two null hypotheses were postulated to guide the study and were tested at 0.05 level of significance at the appropriate degree of freedom. The population of the study consisted of 500 rural dwellers in Takum Local Government Area. Multistage sampling procedure with appropriate techniques were used to draw 217 respondents which were used for the study. The instrument for data collection used in the study was the researchers'-designed questionnaire. Frequencies and percentages were used to answer the research questions while chi-square statistic was used to test all the null hypotheses at 0.05 level of significance and at the appropriate degree of freedom. The findings of the study revealed that: a high proportion of rural dwellers used all the available sources of water, also, a high proportion of rural dwellers used all the water collection practices, while another high proportion of rural dwellers adopted all the water storage practices. The study recommended among other things that: the Taraba State Government and Local Authorities should prioritize the provision of adequate water supply infrastructure, including boreholes, wells, and piped water systems, to ensure that rural dwellers have access to safe and clean water. Rural dwellers should be informed, enlightened, educated and conscioustized on the importance of water conservation practices, such as fixing leakages, using water-efficient appliances, and harvesting rainwater, to reduce water waste and optimize water use. Regular water guality monitoring should be conducted to ensure that water sources are safe and free from contamination. This can be archived through the establishment of water quality monitoring stations and the training of local water quality

monitors and Community-Led Total Sanitation (CLTS) Approach. The CLTS approach should be adopted to promote sanitation and hygiene practices among rural dwellers. This approach involves empowering local communities to take ownership of their sanitation and hygiene practices in order to ensure a very high water quality maintenance and safety.

Keywords: Assessment, Water Management, Practices and Adult Rural Dwellers

INTRODUCTION

Adequate access to clean and potable water is a fundamental human right, essential for human survival, health and well-being. However, the availability and management of water resources remain a significant challenge in many rural communities worldwide, including Nigeria (World Health Organization (WHO)/United Nation Children's Education Fund (UNICEF), 2020). Takum Local Government Area of Taraba State, Nigeria is a rural setting where access to clean water is limited. The area is characterized by inadequate water supply infrastructure, poor sanitation, and limited awareness of proper water management practices among rural dwellers (Taraba State Ministry of Water Resources, 2020). These challenges are exacerbated by climate change, population growth, and inadequate governance, which further threaten the availability and sustainability of water resources in the area.

Effective water management practices are critical to ensuring the availability of safe and clean water for rural communities. However, there is an urgent need to assess the current water management practices among rural dwellers in Takum Local Government Area to identify gaps and areas for improvement. This study aims to bridge this knowledge gap by assessing the water management practices among selected rural dwellers in Takum Local Government Area of Taraba State, Nigeria. Water is indispensable to maintenance and sustenance of life process and therefore, must be given the first and highest priority. Man compulsorily requires regular and accessible supply of water which as a biological imperative forms a major component of his cells, about 75 per cent of the liquid content of the human body (WHO & UNICEF, 2020). Water is a clear sparkling, colourless and tasteless fluid (WHO, 2016). It contains two atoms of hydrogen and one atom of oxygen hence its chemical formular is H₂O. According to Bitrus (2021), water is a great cleaning agent both externally

and internally. Manasis (2020) described water as that substance that is free from impurities, pathogenic organisms or other harmful elements thus is without taste or odour, aesthetically appealing and socially acceptable for human consumption. In this study, water is referred to as clear liquid without colour, odour or taste. It has essential requirement for vital physiological and biochemical processes such as digestion, respiration, excretion and circulation. The available quantity of fresh water is also linked to human in several ways, such as water for ingestion, water for hygiene and water for food production. Even when water is available it requires adequate sourcing, collection, transportation, storage and treatment before use. These activities constitute water management practices. However, this study will be delimited to assess the water sources, collection and storage practices among the selected adult rural dwellers in Takum Local Government Area of Taraba State, Nigeria.

Management is the totality of the processes through which appropriate human and material resources are made available and effective for accomplishing the purpose of an enterprise or organization (American Association of School Water management also involves making the optimum use of water sources. Water source refers to locations or places where fresh water flow abundantly in the foam of river, lake, pond or stream. Musa (2022) defined water sources as settings or localities where water exists or is found. According to WHO (2023), water source refers to sites or spots where water is usually obtained and they appear in form of groundwater, rivers, lakes, and reservoirs. In this study, water source refers to locations where water that is useful or potentially useful to man can be found. According to WHO (2020), water sources when found should be constructed and designed to protect the available water from outside contamination. Good water source provides drinking water for man. Sources that meet the requirements or criteria of improved drinking water include: a household connection pipe, public pipe borne water, borehole, protected dug well, protected spring or rainwater collection. WHO (2020) further asserted that drinking water comes from different sources depending on where people live. Three sources that are commonly used by rural dwellers to collect drinking water are rain water, surface water and groundwater. Patrick (2022) opined that water sources must conform to two criteria, namely; the quantity must be sufficient to meet present and future requirement and the quality of water must be acceptable. Federal Ministry of Water Resources (2022) opined that most suitable water source developed for use by any community depends on the quantity and quality of the source under consideration for development. The selection of the most appropriate water source for human use in a specific region may result from a wide variety of options available which include ground water, surface water and rain water.

STATEMENT OF THE PROBLEM

Despite the critical importance of water for human survival, health, and well-being of the rural dwellers in Takum Local Government Area of Taraba State, Nigeria, continue to face formidable challenges in accessing safe, clean, and adequate water supplies. The inadequate water management practices among the rural dwellers in the area have resulted in widespread water-borne diseases, poor sanitation, and hygiene practices, thereby exacerbating the vulnerability of rural communities to water-related health risks. The existing water management practices in the area are characterized by: inadequate water supply infrastructure, limited awareness and knowledge of proper water management practices, ineffective water quality monitoring and surveillance, poor sanitation and hygiene practices, inadequate community participation and involvement in water management decision. These challenges have significant implications for health, well-being, and livelihoods of rural dwellers in Takum Local Government Area of Taraba State, Nigeria underscoring the need for a comprehensive assessment of water management practices among rural dwellers in the area, this study aims to address this knowledge gap by assessing the water management practices among the selected rural dwellers in Takum Local Government Area of Taraba State, Nigeria

Situations of this nature have led to studies on water management among both rural and urban dwellers in different parts of the world, Nigeria inclusive but to the best of the researchers' knowledge no such study has ever been conducted specifically on water management practices among rural dwellers in Takum Local Government Area, Taraba State, this therefore constitute the hard nut to crack in the current study.

Purpose of the study

The purpose of the study was to assess the water management practices among selected adult rural dwellers in Takum LGA, Taraba State, Nigeria.

Specific Objectives of the Study

Specifically; the study sought to:

1. assess the Sources of water commonly used by adults in some selected rural dwellers in Takum LGA based.

2. assess the water collection practices among adult in some selected rural dwellers in Takum LGA based.

3. assess the water storage practices among adult in some selected rural dwellers in Takum LGA based.

Research Questions

The following research questions were formulated to guide the study:

1. What are the Sources of water commonly used by selected adult rural dwellers in Takum LGA?

2. What are the water collection practices among selected adult rural dwellers in Takum LGA?

3. What are the water storage practices among selected adult rural dwellers in Takum LGA?

Hypotheses

The following two null hypotheses were postulated to guide the study and were tested at 0.05 level of significance and at the appropriate degree of freedom:

Hypothesis One

HO¹: There is no statistically significant difference in the water management practices of adult rural dwellers in Takum based on age.

Hypothesis two

HO²: There is no statistically significant difference in the water management practices of adult rural dwellers in Takum based on gender.

Review of Related Literature

Water is an inorganic chemical substance consisting of two hydrogen atoms attached to the central oxygen atom via a covalent bond, hence its chemical formula is H₂O. The transient hydrogen bonds between water molecules form a transparent, colourless, odourless, and tasteless liquid. Water is regarded as the universal solvent primarily due to its chemical and physical properties. It is one of the major inorganic compounds of biological importance. According to Manasis (2020), water is a great cleaning agent both externally and internally. In the context of this study water is referred to as a clear liquid without colour, odour or taste. It has essential requirement for vital physiological and biochemical processes such as digestion, respiration, excretion and circulation. The available guantity of fresh water is also linked to human health in several ways such as water for ingestion, water for hygiene and water for food production. Access to improved water should be a central element of health strategies and should be seen as the most cost- effective preventive measures against water borne diseases which, for the poor, are the most prevalent sources of morbidity and death especially for children (European Commission, 2018). Provision of portable water facilities is an essential component of education strategies. Water generally comes among the three top priorities in community development programs or social investment (American Public Health Association, 2022). According to Federick (2021), major rivers, lakes and underground aquifers cross national boundaries and mismanagement of water can be a source of potential conflict and can lead to drought. Water security is an enabling condition for development. Livelihoods can be enhanced by ensuring equitable access to portable water sources and health can be improved by enhancing or improving water quality (Hope, 2023). This can be achieved through protection of water source.

Ground water is universally distributed both as a natural outpouring of an aguifer in the form of springs and as wells excavated in the earth to reach an aquifer. According to Hutomba (2022), ground water contains excess of inorganic matter and little or no organic impurities. It is free from suspended matter and comparatively with surface water; it is less aerated and less agreeable in taste. Ground water drawn from adequately protected deep well is naturally free from pathogens when it is properly collected. Water management is an underlying activity necessary for the success of a whole range of sectors including economic growth, agriculture, industry, hydropower generation, environmental protection, health, tourism, transport (in some countries) (Fumlack, 2022). More efficient use of water for agriculture (the largest water consumer) boosts food production, reduces hunger, promotes growth and enables more of this vital resource to be available for other important uses, both domestic and industrial (Fumlack, 2022). Even when water is available for all these, it requires adequate sourcing, collection, storage and treatment. This means that water needs proper management.

Management is seen as a process through which group efforts or activities are directed towards the achievement of preconceived objectives (Nasiru, 2021). American Public Health Association (2022) defined management

as the totality of the process through which appropriate human and material resources are made available and effective for accomplishing the purpose of an enterprise or organization. Anthony (2020) viewed management as a process of getting things accomplished or done through the assistance of other people. Management is also viewed as a process of tactfully controlling or bringing various elements to work together for some particular purpose (Bitrus, 2021). In this study, management refers to the process by which available human and material resources are effectively utilized to Achieve set objectives. When this is done regularly, it becomes a practice.

Practice is a habitual action-custom (Barnabas, 2020). Charles (2020) described practice as a habitual activity, procedure or custom. Practice is also viewed by Bitrus, (2021) as something done habitually or customarily. David (2022) defined practice as any customary action or proceeding regarded as individuals' habit. Practice in this context is conceived asp articular way of doing something regularly. When management practice relates to water, it is called water management practices. Thus, water management practices are referred to as correct ways by which rural dwellers source, collect, store and treat water. The correct ways include; fetching water from improved sources such as spring water, pipe-born water and rain water, collecting and storing water using clean container and adopting appropriate water treatment such as boiling, filtering, addition of alum and use of solar disinfection techniques among others. There are some undesirable practices which include fetching water from unprotected sources, poor collection and storage of water. These practices may be common or uncommon among rural dwellers in Takum Local Government Area of Taraba State (Taraba State Ministry of Water Resources, 2020).

In rural areas of Nigeria, water is traditionally managed for two major purposes namely agriculture and domestic consumption, although this distinction is blurred sometimes. The water so collected is being used to meet domestic needs in addition to requirements for watering livestock, for runoff farming and irrigation. Rainwater collection (harvesting) is extensively practiced for the purposes of domestic consumption using indigenous methods for rainwater collection, purification and storage. However, part of the harvested water is being used to provide water for backyard gardens (farms), and domestic livestock. The two major techniques of water harvesting are micro-catchments and roof collection (Dwamasco, 2022). With reference to roof collection techniques, until the advent of western containers such as plastics and metal, Africans typically collects rainwater from • roof-tops with the aid of calabashes and earthen pots (Joseph, 2020). These objects are merely placed below the roof eaves and the water drops into them.

Another traditional collection technique involved the construction of sliced bamboo gutters along the roof leaves, through which the water flows into calabashes and earthen pots. The water would then be taken into homes and rural areas for consumption purposes by rural dwellers (Joseph, 2020). As regards to storage, Joseph (2020), opined that young females use open plastic buckets that may likely subject the water to a lot of contamination before reaching point of use while some tribes still use gourds and clay containers. Clay containers are clean but too heavy while gourds are not hygienically good to fetch water that is meant for cooking and drinking. Adult males that fetch use covered jerry cans which they tie on their motorcycles. This to some extent is good but frequency of washing the containers will have to be considered too (WHO/UNICEF (2020)). In several parts of Africa, water meant for drinking is subjected to one form of treatment or the other. Whenever surface water has been collected, it is allowed to stand for some hours before it is decanted into earthen pots for storage. The precipitated materials are discarded.

In most households' water hygiene is a top priority. For example, in many African societies the household prohibits any body from using his/her own cup (calabash usually) to fetch water from the communal water pot. Rather there is a container (a calabash in southern Nigeria) fastened to the pot, which all members of the household are expected to use for collecting water into their own containers for drinking. Earthen pots are often buried in compounds rather than inside rooms in the hot arid and semi-arid areas so that the water temperature could be moderated (Joseph, 2020). In 'addition, empirical investigations by the researchers also revealed that there are several other innovative indigenous technologies for rural water supply management (treatment) in different parts of Nigeria. Some of these indigenous technologies include pot chlorination, solar disinfection, simple sand filters, nylon filters, harvesting of groundwater and recharging of groundwater, among others.

Kabiru, (2022), opined that the most common methods of water treatment adopted by the rural dwellers is coagulation which is usually done during

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rainy season when the water sources are not clean enough as a result of pollution by runoff. Coagulation involves addition of alum which will only make the water clearer by coagulating suspended and colloidal particles but will not kill the pathogens. Boiling, chlorination and filtration are affordable water treatment techniques that should be encouraged among the rural dwellers and those depending on shallow wells and streams as drinking water should be advised to always boil the water before use (Federal Ministry of Water Resources (2020).

Water is not only a vital environmental factor to all forms of life, but it also has a great role to play in socio-economic development of human population. One of the essential public health care elements is safe drinking water. Water quantity is as important as water quality. Washing hands after defecation and before preparing food is of particular importance in reducing disease transmission but without abundant water near our homes, hygiene becomes difficult or impossible. The lack of water supply is the primary reason diseases are so common in developing countries. According to Joseph (2020), the physiological requirement for drinking water has been estimated at about 2 litres per head per day. This is just for survival, but from the stand point of health and improvement of the quality of life, water should be provided in adequate volume. It will help to reduce the incidence of many water- related disease among the people (United Nations, 2020).

Consumption of water depends upon climate conditions, standard of living and habits of the people (Bitrus, 2021). A daily supply of 150-200 litres per-person is considered as an adequate supply to meet the needs for all domestic purposes. Unfortunately, water supply from the government source is generally irregular and unreliable thus, inadequate to meet the needs of the households. Consequently, most households use additional or supplementary sources of water from yard, well, bore holes and water vendors (truck pushers). The quality of such water is generally considered to be poor (not drinkable) (Joseph, 2020). United Nations (2022) asserted that consumption of contaminated water precipitates water-related, diseases such as cholera, hepatitis, dengue fever, schistosomiasis, gastroenteritis and diarrhea among others. Bitrus (2021) asserted that diarrhea is a major cause of disease and death, especially among young children in low-income countries. Dehydration also is a major threat, though diarrhea also reduces the absorption of nutrients, causing poor growth in children, reduced resistance to infection, and 'potentially long-term gut disorders. Among infectious diseases, diarrhea ranks as the third leading cause of both morbidity and mortality after respiratory infections and HIV/AIDS, placing it above tuberculosis and malaria (Bitrus, 2021). A recent report (WHO, 2022) estimated that almost 10 per cent of the global burden of illness is related to water, through contaminated drinking water and poor water management practices.

WHO (2022) published guidelines for drinking water guality intended for use by countries as a basis for the development of standards, which if properly implemented, will ensure the safety of drinking water supplies. The guidelines for drinking water quality recommended by WHO explained that it should be free from microbiological, chemical and physical qualities. However, it is stressed that microbiological quality is the most important since this is biggest cause of illness and death around the world (WHO, 2023). United Nations Children's Fund-UNICEF's work in more than 90 countries around the world is to improve water supply and facilities in schools and to promote safe hygiene practices. All UNICEF WASH programme are designed to contribute to the millennium development goals for water availability to have by 2019 the proportion of people without sustainable access to safe water (UNICEF 2021). Meeting the MDGs for water supply in the next decade will require substantial economic resources, sustainable technological solutions and courageous political will. Improved water must not only be provided to those who currently lack these fundamental services, but also to ensure that these services provide safe drinking water, adequate guality of water for health, hygiene, agriculture and development and sustainable approaches to protect health and the environment.

In selecting a source of water, attention must be given to possible future developments that may influence the continued suitability of the source (Bitrus, 2021). Other consideration according to the author include quantity (source capacity) (the quantity of water should be sufficient to meet continuing water demands, taking into account daily and seasonal variations and projected growth in the size of the community being served); quality, (the quality of raw water should be such that, with appropriate treatment, it meets the drinking water standards.); protection: (the watershed be protected from pollution with human excreta, industrial discharge and agricultural run-off); feasibility: (the source should be available at reasonable cost) and treatability: (the raw water should be treated adequately under locally prevailing conditions.) (Lucas & Gills,

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2020). The only way to reduce the burden of repeated dirarrhoea episodes and related serious long-term health consequences is through enhanced water management practices (WHO/UNICEF, 2020).

There are some socio-demographic factors capable of affecting water management practices of rural dwellers. They include: age and gender among others. Age is a factor capable of influencing water management practices of rural dwellers. Age is a length of time that' person has lived. According to WHO (2020), age is the period of time someone has been alive or something has existed. Age has been identified by some studies as one of the strong factors capable of influencing water management practices. Joseph (2020) asserted that young age groups (18-30) are more conscious of the source and quality of water they use. Bitrus (2021) identified that adolescent girls (18-30) recorded high rate of adherence to adequate water management than older females of 46Y ears and above. WHO (2020) observed that when water is scarce, supplies is irregular and when water supply is irregular, water quality is poor, rural dwellers especially the elderly men and women (45 and above) are mostly affected as they cannot withstand the stress of walking long distances to fetch water, spending hours per day, burdened under heavy containers and suffering acute physical problems, especially in drought prone areas. Consequently, the elderly men and women are among the poor and tend to be most adversely hit by the lack of water and poor management of the available source. This will lead to continued use of unsafe water as well as limited access to existing water sources.

Gender has a tremendous influence on water management. In most societies and developing world, particularly in both its rural and traditional urban settings, decisions about household water use fall directly on women who are expected to simply get water by whichever means while the male goes to farm or for other economic activities for household livelihood (Joseph, 2020). Women have the primary responsibility for management of water supply at the household level. Women form the major group (60%) involved in fetching water in all cases. This shows that water fetching is the primary responsibility of women. UNICEF (2022) stated that the burden of fetching water from distant sources takes time away from productive activities, childcare, education or leisure. The report further stated that in sub-Sahara Africa, women spend an average of just half an hour for each trip to a water source. Since in most cases several trips are made per day, this represent significant amount of time lost. The time spent in search of water may force some rural dwellers to resort to any source available. In a typical African community, there is a near strict division of labour in households in relation to water fetching, cooking and farming activities (Joseph, 2020). The first two is almost exclusively reserved for women while the last is for men. This has implication for planning for water supply

Materials and Methods Research Design

The cross-sectional survey research design was utilized in order to achieve the purpose of the study. Cohen, Manion and Morrison (2018) posited that cross-sectional design is one that produces a picture of a population at a particular point in time. Therefore, this design is considered most appropriate for use in this study

Area of the Study

The study was carried out in Takum Local Government Area (LGA), Taraba State. Takum is a Local Government Area in Taraba State, Nigeria. Its headquarters is in the town of Takum town

Population/Subjects for the Study

The population for the study consisted of all adult rural dwellers in Takum Local Government Area, Taraba State. The total population of the rural dwellers was estimated to be 500 (National Population Commission 2020).

Sample and Sampling Technique

The sample size for the study consisted of 217 respondents. Multi-stage sampling procedure with appropriate techniques was used to draw 217 respondents at 95 percent confidence level and 5 percent confidence interval as stated by Cohen, Manion and Morrison, (2018)

Instrument for Data Collection

The instrument for data collection was the researchers- designed Water Management Practices Questionnaire- WMPQ. Copies of questionnaire were administered to the respondents in each community in their houses by the researchers and three research assistants who were briefed on the modalities for the administration of the instrument. The respondents completed the copies of the questionnaire on the spot and returned them immediately.

Method of Data Analysis

The information from the questionnaire was coded using the Statistical Package for Social Science (SPSS) batch system (version 20) to analyze the data. In determining the water management practices of the respondent, frequencies and percentages was used to answer the research questions while chi-square statistic was used to test all the null hypotheses at 0.05 level of significance and at the appropriate degree of freedom.

Results

Research question One.

What are the sources of water commonly used by rural dwellers in Takum LGA,

Taraba State? Data answering this question are contained in Table 1.

Table 1: Frequency and Percentage of Sources of Water commonly used by Rural Dwellers in Takum LGA (n= 217)

S/N Sources of Water	Yes f (%)	No f (%)	
1. Source water from Shallow wells	117 (53.9)	100(46.0)	
2. Source water from Deep wells	170(78.3)	47(21.6)	
3. Source water from Rivers	180(82.9)	37(17.0)	
4. Source from Streams	200(92.1)	17(7.8)	
5. Source water from Lakes	17(7.8)	200(92.1)	
6. Source water from Boreholes	190(87.5)	27(12.4)	
7. Source water from Rain	210(96.7)	7(3.2)	
8. Source water from Taps	40(18.4)	177(8.5)	
Cluster %	64.7	35.3	

Data in Table 1 show the sources of water commonly used by rural dwellers in Takum LGA, Taraba State. The results indicate that overall, 64.7 per cent of rural dwellers used all the available sources of water. Specifically, 96.7 per cent of rural dwellers sourced water from rain, 92.1 per cent sourced their water from streams, 87.5 per cent sourced water from the boreholes, and 82.9 per cent sourced water from river while 78.3 percent sourced their water from deep wells.

Researches question Two.

What are the water collection practices used among selected rural dwellers in Takum LGA, Taraba State? Data answering this question are contained in Table 2.

Table 2: Frequency and Percentage of Water Collection Practices among Rural Dwellers in Takum LGA, Taraba State (n= 217)

S/N Water Collection Practices	Yes f (%)	No f (%)
9. Collect water in buckets	160 (73.7)	57 (26.2)
10. Collect water in buckets with cover	195 (89.8)	22 (10.1)
11. Collect water in Jerry cans	180 (82.9)	37 (17.0)
12. Collect water in clay pots	169 (77.8)	48 (22.1)
13. Collect water in plastic receptacles	175 (80.6)	42 (19.3)
14. Collect water in basins	159 (73.2)	58 (26.7)
15. Collect water in surface tanks	99 (45.6)	118(54.3)
16. Collect water in drums	200 (92.1)	17 (7.8)
Cluster %	78.1	21.7

Data in Table 2 show the water collection practices of rural dwellers in Takum LGA, Taraba State. The results indicated that overall, 78.1 per cent of rural dwellers used all the listed containers in fetching/collecting water. Specifically, 92.1 per cent of the rural dwellers used water drums and another 92.1 percent of the rural dwellers used jerry cans to fetch water, 89.8 per cent used buckets with cover to collect water, 80.6 per cent used plastic receptacles to collect water while 73.7 per cent used buckets to fetch water.

Research question Three.

What are the water storage practices used among rural dwellers in Takum LGA, Taraba State? Data answering this question are contained in Table 3.

Table 3: Frequency and Percentage of Water Storage Practices among Rural Dwellers in Takum LGA, Taraba State (n= 217)

S/N Water Storage Practices	Yes f (%)	No f (%)
17. Store water in plastic bowl	199 (58.3)	18(41.7)
18. Store in basins	169 (54.7)	48 (45.3)
19. Store water in tanks	104 (74.9)	113 (25.1)
20. Store water in drums	186 (72.3)	31 (27.7)
21. Sore water in locally constructed reservoir	36 (48.4)	181 (51.6)
22. Store water in clay pots	200 (66.3)	17 (33.7)
23. Store water in buckets	166 (61.4)	51 (38.6)
24. Store water in metals tanks	69(61.7)	148 (38.3)
Cluster %	64.7	35.3

Data in Table 3 show the water storage practices of rural dwellers in Takum LGA, Taraba State. The results indicate that overall, 64.7 per cent of rural dwellers used all the listed containers in storing water. Specifically, 74.9 per cent of the rural dwellers stored water in tanks, 72.3 per cent stored water drums, and 66.3 per cent stored water with clay pots while 61.7 per cent stored water in metal tanks.

Hypotheses Hypothesis One

There is no statistically significant difference in the water management practices of adult rural dwellers in Takum based on age.

Table 4: Summary of Chi-Square analysis of no Significant difference inWater Management Practices of rural Dwellers in Takum based on AgeWater Management Practices

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		Y	No				
S/N	Variables N	O (E)	O(E)	X ² df	sig		
1. 17-30 years	s 160	40 (73.4)	120 (48.6)				-
2. 31-46 years	5 50	10 (13.5)	40 (45.5)	7.86	2	.020	
3. 47 years +	7	4 (1.1)	3 (3.9)				
Total	217						
							_

Significant at P < .05

Data in Table 4 show the results of chi-square test for independence of no significant difference in the water management practices of rural dwellers based on age. The table shows that a significant difference was found in the water management practices of rural dwellers based on age. This therefore implies that rural dwellers differ significantly according to age in their water management practices.

Hypothesis two

There is no statistically significant difference in the water management practices of adult rural dwellers in Takum based on gender.

Table 5: Summary of Chi-Square analysis of no Significant difference in Water Management Practices of rural Dwellers in Takum based on Gender

Water Management Practices								
S/ Variables	N	Yes O (E)	No O(E)	X²	df sig			
1. Male	117	29 (56.5)	88 (191.5)					
2. Female	100	36 (31.5)	64 (106.5)	.803	1	.378		
Total	217		. ,					

Significant at P < .05

Data in Table 5 show the results of chi-square test for independence of no significant difference in the water management practices of rural dwellers based on gender. The table shows that no significant difference was found in the water management practices of rural dwellers based on gender. This therefore, implies that rural male and female dwellers did not differ in their water management practices.

DISCUSSION

The findings of the study are hereby discussed as follows:

The findings of the study in Table I show that high proportion of rural dwellers mostly used deep well, rain, stream, river and borehole (64.7%). The findings on hand-dug well and borehole were expected and therefore not surprising because, all communities have some access to water, but the safety of the water they consume is less often assured. The finding is consistent with the findings of Patrick (2022) who found that rural dwellers used there were hand-dug wells and borehole pumps as water sources and that water available year round. The author further reported that not all house hold collected water from improved sources. The result on rain water is also expected and not a surprise. It is in line with the finding of Manasis (2020) on health implications of water management practices of rural women in Takum community. The 'findings showed that the main source of water for domestic use was rain water which was collected and stored in clay pots and drums, or harvested as affluent or surface water and stored in shallow earthen wells. The available source of water (rain) exposed the people to water borne diseases because it was not well harvested and stored.

Table 2 reveals that rural dwellers mostly used open bucket, jerry cans, basins, and drums to fetch water. The result on open buckets and basins were expected and therefore not a surprise because observation shows that rural dwellers fetch water using open containers like buckets and basins. This is the

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reason when water is being carried from long distances, there are chances of contamination to the water before it reaches home. This agrees with the findings of Nasiru (2021) who observed that water contamination occur during and after water collection often because of open containers and unhygienic handling during collection. The finding on jerry cans was not expected and therefore surprising because, the researcher observed that most rural dwellers do not use jerry cans in fetching water. Jerry cans are normally used by urban youths who feel like giving helping hand by fetching water.

The findings in table 3 reveal that rural dwellers mostly used tanks and drums to store water. The findings were expected and not a surprise, this is in consonance with the findings of Joseph (2020) who found that rural women collected their water and stored in clay pots, tanks and drums. To maintain the quality of treated water within the home, safe storage is very important. In water storage, it is important to keep the container clean and prevent hands and dippers from touching the water. Health educators should organize health talks for rural dwellers on safe water storage in order to maintain health.

SUMMARY

The purpose of the study was to assess the water management practices among adult rural dwellers in Takum Local Government Area, Taraba State, Nigeria. In order to accomplish this purpose, three specific objectives with corresponding research questions and two null hypotheses guided the study. Literature pertinent to the study was reviewed. The cross-sectional survey research design was utilized. The population for the study consisted of 500 adult rural dwellers in Takum Local Government Area, Taraba State, Nigeria. Multi-stage sampling procedure with appropriate techniques were used to draw the sample for the study. The major findings of the study among other things included; that: a high proportion of rural dwellers used all the available sources of water, another high proportion of rural dwellers adopted all water collection practices, and equally, a high proportion of rural dwellers adopted all the water storage practices.

CONCLUSIONS

Based on the findings and discussions of the study, the following conclusions were drawn;

The study revealed that rural dwellers in Takum LGA of Taraba State, Nigeria had a high proportion of them who used all the available sources of water; another high proportion of rural dwellers used all the water collection practices, while a further high proportion of rural dwellers adopted almost all the water storage practices; all these attributes were characterized by limited access to clean water, poor sanitation, and hygiene practices. These practices exacerbated the vulnerability of rural communities to water-borne diseases, underscoring the need for sustainable water management interventions.

RECOMMENDATIONS

Based on the findings, discussions and conclusions of the study, the following recommendations were made:

1. The Taraba State Government and Local Authorities should prioritize the provision of adequate water supply infrastructure, including boreholes, wells, and piped water systems, to ensure that rural dwellers have access to safe and clean water.

2. Rural dwellers should be informed, enlightened, educated and concioustized on the importance of water conservation practices, such as fixing leakages, using water-efficient appliances, and harvesting rainwater, to reduce water waste and optimize water use.

3. Regular water quality monitoring should be conducted to ensure that water sources are safe and free from contamination. This can be achieved the establishment of water quality monitoring stations and the training of local water quality monitors.

4. Community-Led Total Sanitation (CLTS) Approachthe CLTS approach should be adopted to promote sanitation and hygiene practices among rural dwellers. This approach involves empowering local communities to take ownership of their sanitation and hygiene practices.

5. Capacity building for local water management committees: local water management committees should be established and strengthened through capacity-building programs to enable them to effectively manage water resources and provide support to rural dwellers.

6. Integration of water management into agricultural practices: Rural dwellers should be educated on the importance of integrating water management into their agricultural practices, such as using

drip irrigation and mulching, to optimize water use and reduce water waste.

7. Development of water management policy and framework: The Taraba State Government should develop a comprehensive water management

policy and strategies for water resource management, water supply, sanitation, and hygiene. This policy and framework should be regularly reviewed and updated to ensure that they remain relevant and effective.

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