Household Water Consumption Patterns in Ondo State, Nigeria

Adelakun, E.O.[1] and Adeniran, I.B. [2*]

[1]Department of Agricultural Extension and Rural Development, Faculty of Agriculture, University of Ibadan, Oyo State.

[2]Department of Biological Sciences, College of Natural and Applied Science, Achievers University, Owo, Ondo State.

Corresponding Author's E-mail: adeniran.ib@achievers.edu.ng

ABSTRACT

The study was conducted in Ondo State using multi-stage sampling procedure. Purposive sampling was used to select two communities while systematic random sampling was used to select 150 households with 75 respondents each from the two communities. Questionnaire and interview schedule were employed to elicit information on variables and data collected were analyzed using descriptive statistics. Majority (66.0%) were married with mean household size of 5.5 ± 2.9 members. About (41.3%) had tertiary education, less than half (37.4%) of the respondents obtained their water from well and borehole. The respondents were faced with water constraints such as water inaccessibility (1.07) and high price of water (0.40). Furthermore, water conservation strategies of the respondents include washing of used plates once a day (1.29), washing of face and foot to reduce water used for bathing (0.81), repeated wearing of clothes more than twice (0.83) and skipping bathing or ration bathing at intervals during the week (0.47). Majority (56.0%) of the respondents had favourable attitude towards sustainable water management practices and they consumed 102 litres to 162 litres of water per day. The quantity of household daily consumption of water was between 148.8 ± 61.4 litres with drinking and clothes washing being the most important activities water are used for and are used more than twice a day. Government at all levels should ensure safe sources of water for both urban and rural households and also make them available and accessible for daily consumption.

KEYWORDS: Water Consumption, Water Shortage, Household, Water Consumption Pattern.

1.0   Introduction

The most vital natural resource for quality of life and sustainable development is water, but it is not equally distributed among the world's population; over one-fifth of people live in areas with acute water shortages, and another quarter live in areas with limited access to water (UNDP, 2012). World Health Organization (WHO), United Nations International Children's Emergency Fund (UNICEF), and other international organizations have worked extremely hard to ensure safe home water supply around the world in an effort to address these issues. Because of this, 61% of people in sub-Saharan Africa and 90% or more of those in Latin America, Northern Africa, and significant portions of Asia now have access to improved water supplies, up from 76% in 1990 and more than 89% in 2010 (UNDP, 2012).

The good impact on the livelihoods of the underprivileged is one benefit of water use that should not be disregarded. Rural livelihoods are significantly impacted by water use, particularly in

the vast semi-arid and arid regions of emerging nations (Hope, Jewitt, Gowing, and Garratt, 2003). Water collection is essential in terms of time consumption because it might be a resource employed in or required for productive activities (Makoni *et al.,* 2004; Soussan, 2003; Pollard *et al.,* 2002). According to Mokgope and Butterworth (2001), rural populations can be categorized according to how they use water. Water is utilized for survival purposes, including drinking, cooking, sanitation, and hygiene. The main effects and advantages on health are associated with these basic human necessities. These uses of water for productive purposes have an effect on one's ability to eat or earn money. Producing veggies for survival or building bricks are examples of outputs that can be used for personal consumption or sold on the market in the form of produce like ice cubes or fruits. Services-related endeavors (like hair salons) may also be included in some activities; Water utilized for other purposes, primarily those related to religion or the environment and not for the purposes of industry.

Water is necessary for many home functions, including drinking, cooking, and sanitation. It is also a vital input for industry, tourism, and cultural activities, as well as for maintaining the ecosystems of the planet (Rosegrant, 2015). Human needs for water are expanding, and rivalry between diverse users (agricultural, industry, homes, energy, and environment) is getting more intense as human population and economic development levels rise (Soussan, 2003; Bouhia, 2001). Due to the rising rate of population increase, the growing demand for water may result in water scarcity.
All social and economic sectors are impacted by water scarcity, which jeopardizes the sustainability of the natural resource base. In order to optimize economic and social wellbeing in an equitable manner without jeopardizing the preservation of essential ecosystems, managing water resources demands an intersectional and interdisciplinary approach. Sector-wide integration is required.

Development, supply, use, and demand must all be considered in this integration, with a focus on people, their way of life, and the ecosystems that support them. For programs to reduce water scarcity to be successful on the demand side, increasing water productivity (the amount of production per unit of water) in all sectors is essential (FAO, 2007). To increase the supply of high-quality water, it is essential to preserve and replenish the ecosystems that naturally catch, filter, store, and release water, such as rivers, wetlands, forests, and soils.

From 36% in 1990 to 56% in 2010, rural communities in developing nations have access to a reliable source of safe water, a significant rise (World Bank, 2012). Despite the progress made, however, it is anticipated that improved domestic water supply systems will still experience water shortages. This issue will worsen as a result of population growth, economic expansion, improved living conditions, and changing lifestyles in rural areas (Shove *et al.,* 2010). Therefore, the creation of efficient public policies and strategies for managing water in rural areas with access to better water supplies is urgently needed.

To effectively manage the water supply and establish relevant public policies, a detailed understanding of water consumption trends and the factors influencing water consumption is essential. Water consumption patterns are extremely intricate processes that depend on a variety of variables, including seasonal variation in water availability, water supply restrictions, tariff structure and pricing, family characteristics, and attitudes and intentions toward water conservation (Corral *et al.,* 2002). These elements influence water use and consumption patterns both directly and indirectly. (Jorgensen *et al.,* 2009).

Researchers have concentrated on the water consumption in metropolitan areas when examining the aforementioned problems. The demand among rural families of developing nations, where

traditional and cultural influences on water usage are anticipated, has not been thoroughly studied.

As a result, the study project in Ondo State critically examined household water usage trends in a number of rural and urban regions.

1.1 Statement of the Problem

The world's water supply is in danger, and the growing scarcity in many parts of the world presents problems for both national and subnational governments as well as for individual water users (Rosegrant, 2012). Every continent already suffers from a lack of water. Another 1.6 billion people, or almost one-quarter of the world's population, experience economic water shortages (i.e., because their countries lack the infrastructure to draw water from rivers and aquifers). About 1.2 billion people, or nearly one-fifth of the world's population, live in areas of scarcity. Nearly 50% of the world's population is predicted to reside in high water stress areas by 2030, which would likely have an impact on energy and food security (UN, 2012).The difficulties of increasing water scarcity are exacerbated by rising costs of developing new water, degradation of soils in irrigated areas, excessive groundwater pumping and depletion, water pollution and degradation of water-related ecosystems, and wasteful use of already developed supplies, encouraged by subsidies and misaligned incentives that influence water use (Rosegrant 2015).

Future food security outcomes face significant challenges from increasing water scarcity and water quality restrictions, particularly because agriculture is anticipated to continue being the world's largest user of freshwater resources for the foreseeable future despite rapidly rising industrial and domestic demand. In many locations, water will increasingly be diverted from agriculture to other purposes as non-agricultural demand for water rises. Additionally, if significant advancements in water management regulations and investments are not made, the dependability of the agricultural water supply will decrease. Concerns about global food security will persist as a result of the growing sectoral competition, the challenges associated with water shortages, and the decreasing reliability of agricultural water supply. These factors will exert downward pressure on food supplies. Even at the household level, efficient water usage is required to provide water security. To do this, it is necessary to access household consumption patterns because doing so will allow for the identification of the sustainable consumption patterns that may be used as water security measures.

Moreover, in order to ensure adequate water supply, it is imperative to examine the patterns of water consumption which was the basis for this study.

1.2 Objectives of the Study

The specific objectives of this research were to:
  i. identify the socio-economic characteristics of the respondents in the study area.
  ii. examine the household and sanitation characteristics of the respondents in the study area.
  iii. describe water collection characteristics in the study area.
  iv. ascertain the constraints to water use in the study area.
  v. determine the consequences of water shortage in the study area.
  vi. assess water conservation strategies in the study area.
  vii. determine the respondents' attitude towards sustainable water management practices
  viii. ascertain water consumption pattern in the study area.

2.0 Materials and Methods

2.1 Study Area

In 1976, the former Ondo province of the former Western state was split off to become Ondo State, which is situated in Nigeria's south-west geopolitical region. It is fully in the tropical region,

with 18 local government areas, and a total size of around 14,788.723 square kilometers. Ondo state's economy is mostly based on agriculture, which includes farming, fishing, and other activities. The state's principal agricultural products are cotton, tobacco, cocoa, rubber, timber (hardwood and teak), palm oil, and kernels, all of which are grown there. Rice, yams, maize, coffee, cassava, vegetables, and fruits are additional crops.

2.2 Population of the Study

Rural and urban households in Ondo State constituted the population of the study.

2.3 Sampling Procedure and Sample Size

For this investigation, a multi-stage sampling process was adopted. The division of Ondo State's local government areas into rural and urban LGAs was the initial stage. In the second stage, two local government areas (Akure South and Owo local government) were chosen from 20% of the local government areas using a simple random sampling method. In the third stage, 10% of the wards from each of the local government districts were chosen using simple random sampling, resulting in the selection of two wards (Ijo-mimo and Idasen wards).

The fourth stage was using purposive sampling to choose two communities within the wards based on the issue of water scarcity, giving rise to the villages of Ijomimo and Ishijogun. The 150 households chosen for this research effort, with 75 respondents each from the two communities, were chosen in the fifth step using systematic random sampling (nth=5th household). Adult females were used as the study's unit of analysis.

3.0   Results and Discussions

The findings of the study shows that the mean age of the respondents was 33.5± 13years. Majority (66%) of the respondents were married, 49.3% of the respondents were Christian while 44% were Muslim. Also, most 54% of the respondents had 4 – 6 members as the household size. Majority of the respondents were found to be educated, 41.3% had tertiary education and 34% had secondary education while 15.3% had primary education and 9.3% had no formal education. The occupation of the household heads revealed that majority were (33.3%) were farmers, 11.3% were teachers and 10.7% were traders. Majority (74%) of the respondents were from nuclear family.

Also, the study revealed the household and sanitation characteristics of respondents.Majority (34.7%) of the respondents lived in rooming house while 19.3% were housed in mud house and 18.7% resided in mini flat. Furthermore, most (46.7%) of the respondents had water closet and 31.3% had pit latrine as their toilet facility.

The study also discovered the water collection characteristics in the study area. It was discovered that majority (37.4%) of the respondents obtained their water from well and borehole, 8.7% sourced their water from pipe borne and 12.7% sourced water from well, river and rain. It was also discoveredfrom the study that 38% had well located in their house and 27.3% had no water source located within their house and 21.4% had borehole water source within their house. Most (42.7%) of the respondents considered the water supply in their area to be inadequate and 29.3% considered the water supply as poor.

Table 3.1: Distribution of the socio-economic characteristics of the respondents (n = 150)

Variables	Frequency	Percentage	Mean	Standard Deviation
Age				
13 – 25	44	29.3	33.5	12.5
26 – 38	54	36.0		
39 – 51	38	25.3		
52 – 64	13	8.7		
greater than or equal to 65	1	0.7		
Marital status				
Single	51	66		
Married	99	34		
Religion				
Christianity	74	49.3		
Islam	66	44		
Traditional	10	6.7		
Household size				
1 – 3	31	20.7	5.5	2.9
4 – 6	81	54.0		
7 – 9	22	14.7		
10 – 12	11	7.3		
13 – 15	4	2.6		
16 – 18	0	0		
Greater than 18	1	0.7		
Education attainment				
No formal education	14	9.3		
Primary education	23	15.3		
Secondary education	51	34		
Tertiary education	62	41.3		
Occupation of household heads				
Farming	50	33.3		
Trading	16	10.7		
Weaving	8	5.3		
Teaching	17	11.3		
Tailoring	11	7.3		
Fishing	1	0.7		
Blacksmith	1	0.7		
Business	5	3.3		
Civil Servant	11	7.3		
Barbing	1	0.7		
Driving	1	0.7		
Welding	1	0.7		
Nursing	5	3.3		
Doctor	5	3.3		
Banking	7	4.7		
Engineer	2	1.3		
Microbiologist	1	0.7		
Carpentry	2	1.3		
Soil Scientist	1	0.7		
Hunter	4	2.7		
Family type				
Nuclear	111	74		
Extended	38	26		

Source: Field survey, 2019

Table 3.2: Distribution of household and sanitation characteristics of the respondents (n = 150)

Variables	Frequency	Percentage
House type		
Mud house	29	19.3
Hut	2	1.3
Courtyards	1	0.7
Rooming	52	34.7
Mini flat	28	18.7
Standard flat	23	15.3
Bungalow	6	4.0
Duplex	9	6.0
Toilet facility		
None	33	22
Pit latrine	47	31.3
Water closet	70	46.7
Water use devices		
None	82	54.7
Dishwasher	1	0.7
Washing machine	5	3.3
Overhead shower	1	0.7
Water closet	28	18.7
Swimming pool	1	0.7
Washing machine and water closet	10	6.7
Overhead shower and water closet	4	2.7
Washing machine, overhead shower and water closet	12	8.0
Washing machine, water closet and lawn	6	4.0

Source: Field survey, 2019

The study also revealed the water constraints faced by respondents in the study area were water inaccessibility (1.07), non-availability of water (1.00), low quality of water (0.95), long distance to water source (0.94) and high price of water (0.40).

The results also revealed the water conservation strategies of the respondents in the study area which includes: washing of used plates once in a day (1.29), washing of face and foot to reduce water used for bathing (0.81), repeated wearing of clothes more than twice (0.83), reuse of washing water for flushing toilet and other activities (0.73), eating together from the same dish to minimize water use for washing dishes (0.70), piling up of dirty clothes for weeks (0.59), taking turns in using dishes to eat (0.49),and skipping bathing or ration bathing at intervals during the week (0.47).

Also, the study revealed that more than half (56.0%) of the respondents had favourable attitude towards sustainable water management practices and 44% of the respondents had unfavourable attitude towards sustainable water management practices.

Finally, the study revealed the water consumption pattern of respondents in the study area. Majority (40.7%) of the respondents consumed 102 litres to 162 litres of water per day. Also, their frequency of use was based on drinking, cooking, bathing, cloth washing, dish washing, flushing, car washing, other household chores and garden watering.

4.0 Conclusions

Based on the outcome of the findings of this study, the following conclusions were drawn:

Majority of the respondents were young and most of them were married. More than half of the respondents had 4-6 members as their household size and educational attainment reported that majority of the respondents were educated. The occupation of majority of the household heads in the rural area is farming but household heads in the urban area were engaged in diverse occupations like teaching, nursing, banking, engineering etc.

The type of house found in the rural area also differ greatly from those found in the urban center and this directly or indirectly determine the type of their toilet facility and how they use water for different household activities especially toilet flushing.

Majority of the households in the rural area obtained their water from the borehole (just one borehole serving the entire village) while households in the urban area have other sources of water aside borehole. Also, a larger percentage of rural households do not have any water source within their house and had to source for water in the neighborhood. This is why most of the rural household considered the water supply in their area as inadequate and poor.

Constraints faced by water use in the household is minimal in the urban area but is severe in the rural area because of factors like long distance to water source, water unavailability and accessibility.

Based on the consequences faced due to water shortage, the respondents faced low consequences in urban area but the consequences faced in the rural area were relatively high.

The water conservation strategies are very high in the rural area because they do not have diverse sources of water while this is considerably low in the urban area because of their access to different sources of water.

The attitude of the households towards sustainable water management practices is highly commendable in both locations.

Majority of the respondents in the study area preferred water from well and borehole for their daily consumption like drinking, cooking, bathing, cloth washing, toilet flushing etc. Others obtained water from other sources like pipe borne, rainwater etc. Also, majority of the respondents that were engaged in farming activities used water from the river for garden watering.

The average quantity of water consumed by majority of the households in the study area ranges from 148.8 ± 61.4 litres of water per day.

5.0 Recommendations

The following recommendations are hereby suggested based on the findings of this study:

There is need for government and non-governmental organizations to help the rural households in providing water facilities in order to ensure access to safe water.

The problems associated with water shortage in the study area especially the rural areas can be minimized through educating them on efficient and effective ways of water conservation and consumption. Thus, there is need to educate land managers, policy makers, farmers, and the general public on the importance of water conservation.

There is need for effective management of water supply and effective design of related public policies that will be in favour of both the urban and rural areas on water consumption and conservation.

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