



Factors Associated With Water Treatment And Sanitation Practices Among Rural Households In Osun State, Nigeria

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Abstract: The study examined factors associated with water treatment and sanitation practices among rural households in Osun state, Nigeria. A multi-stage sampling technique was employed to select one hundred and twenty respondents for the study. Descriptive statistics such as frequency counts, percentage and mean were used to summarize data collected. Regression analysis was used to determine factors associated with water treatment and sanitation practices employed by the rural households. Results show that rural households' heads were in their middle ages with the mean age of 41.0. majority (86.7%) could read and write. The major occupations of the respondents were farming and livestock rearing. The major sources of water supply were rainfall (81.7%), well (77.5%). Personal ownership through digging of wells was claimed by 39.2 percent. The various treatments given to water being utilized were chlorination (36.7%), addition of alums (33.3%). Results of the regression analysis show that educational status ($\beta=0.287$ $p\leq 0.01$), household size ($\beta=0.142$, ≤ 0.01) and membership of social organization ($\beta=0.133$, $p\leq 0.01$) were factors associated with water treatment and sanitation practices of the respondents. The study recommended that government and non-government agencies should sensitize rural dwellers through public campaign on various techniques of treating water and sanitation practices. These agencies should also endeavor to provide and have access to portable water for the rural dwellers to prevent water-borne diseases among them.

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Introduction

Water is a non-substitutable resource and it is one of the most essential elements of life. Clean water is a merit good that confers relatively large social benefits on society which far outweighs the cost of its provision. It is a good whose consumption is deemed to be intrinsically desirable. Historically, water was available in ample supply and therefore was treated as a free good and continued to remain so even with increase in population and economic growth. As a consequence, many rivers and ground water sources have become polluted and water is now a scarce resource.

Hence, effective water resource management requires that water be treated as an economic good. Access to safe water also supports economic growth. Income benefits for both rural, urban households and government may result from a reduction in the costs of health treatment and gains in productivity. Save drinking water, adequate sanitation and hygiene have

an incredible potential to save and improve lives (Oduunuga, Okeke, Okerie and Olaniyi, 2011).

According to the drinking water quality guidelines of World Health Organization (WHO), water is essential to sustain life and a satisfactory (adequate, safe and accessible) supply must be available to all. It is a common knowledge that water supply to rural communities is sourced from rain water, ponds, wells, streams, sometimes rivers and in recent times boreholes. Some of these sources of water are prone to contamination, therefore contaminants removal is the key in water treatment for many water sources (Oke 200, Shitti, Akpan, Mafiana, Ogunsola, Sodipe 2014). Despite the fact that the Ministry of Water Resources (MOWR) along with the support of many international and local organizations is actively involved at the grassroots level to improve the situation. clean water supply coverage is still very low

in many parts of the country particularly in rural areas where 34% of the population lives (ADF, 2005). One of the bottlenecks for the government is lack of financial requirements for the development of water supply projects. Biswas (2005) indicated that development of rural water supply schemes remains too costly for poor countries relative to their available resources. This problem is exacerbated by high population density particularly in developing countries like Nigeria which results in overcrowding, inadequate planning and poor governance. Inadequate access to safe water and sanitation services coupled with poor hygiene practices kill and sicken thousands of people particularly in the rural communities and leads to impoverishment and diminished opportunities which come from these communities. Dittoh (1985) found a link between good water, good health and farmers' agricultural productivity. It was their submission that one other importance of water in agricultural production which is often overlooked is its role in the health of farmers and their household members. Also, of importance to good water sanitation practices are the presence of organization in the community, attitude and value that promote water quality, community leadership with commitment to water sanitation and existence of social organizations such as health committees and health talks that teach community members the importance of water sanitation and hygiene.

Rural people should therefore adhere to recommended practices of water treatment and sanitation practices due to relative unsafe status of these water sources particularly in their areas. The degree of compliance to these recommended practices is not obvious. It is on the basis of this background that this study proffered solutions to the following research questions:

What are the socio-economic characteristics of the respondents?

What are the sources of water in the study area?

Who owns the various sources of water identified?; and

How do the respondents treat water for their uses?

Objectives of the Study

The main objective of the study is to examine the various factors associated with water treatment in Osun state, Nigeria.

The specific objectives are to:

- describe the socio-economic characteristics of the respondents in the study area;
- identify the sources of water supply in the study area;
- identify the ownership of water supply in the study area; and

- examine the various water treatment and sanitation practices of rural households in the study area.

Methodology

The study was carried out in Osun state which lies within the rainforest region of southwestern Nigeria. Farming is the predominant occupation of the people living in the state. Osun state has thirty Local Government Areas (LGAs). The population of the study was rural dwellers in the study area. A multi-stage sampling technique was employed to select respondents for the study. In the first stage, one LGA was randomly selected from each of the three senatorial districts making a total of three LGAs. At the second stage, two rural communities were randomly selected from each of the three LGAs selected making a total of six communities. At the final stage, twenty rural household were selected randomly from each rural community and one respondent (household head) from each rural household was selected for the study and this gives a total of one hundred and twenty rural household heads. Primary data collected were described with the use of frequency counts, percentages, means, standard deviation, while inferential statistics such as regression analysis was employed to identify factors associated with water treatment and sanitation practices of the respondent. Measurement of respondents' water treatment and sanitation practices was done through the presenting of a list of recommended water treatment and sanitation technologies by the World Health Organization (WHO). Respondents were required to indicate how frequently they treat their water following these recommended practices on a 3-point likert-type scale of "never", "sometimes" and "always" and were scored as 0, 1 and 2.

Results and Discussion

The results on Table 1 show the respondents' distribution based on age. The distribution of the respondents by age show that they were in their middle ages because 31.6 percent were between 21 and 40 years, 28.3 percent of the respondents were between 41 and 50 years while 29.2 percent were between 51 and 60 years with the mean age of 41.0 years. Majority of the respondents (62.5%) were males while 37.5 percent were females. About 57.5 percent were married and 86.7 percent of the respondents could read and write.

The major occupation of the respondents were farming/fishing/livestock rearing as submitted by (43.3%) trading (20.0%), and Artisans (21.7%). Other (15.0%) had agriculture-related activities or jobs such as processing, marketing of different farm produce. The result in Table 1 further indicate that 62.5 percent

of the respondents had household size of between 1 and 6 members, 32 percent had household size of between 7 and 12 members while the remaining 5.0 percent had household members of 13 and above. Household size is an important factor and one of the crucial socio-economic factors. Household size can be related to water sanitation and treatment because it may have adverse impact as the larger the household size the more careful the consideration in the choices of the available water treatment and sanitation practices. Relatively larger percentage of the respondents (40.5%) had their income per annum range between ₦151,000 and ₦200,000, 23.3 percent had less or equal to ₦120,000 per annum as their income. This implies that many of the respondents were living on lean incomes that can rarely afford them good living standard. This presupposed that most rural households in the study area might not be able to expend enough fund on water treatment and sanitation practices. The results in Table 1 further show that 65.0 percent belonged to one social organization or the other while 35.0 percent indicated that they did not share membership with any social organization. This suggests that higher proportion of the respondents belonged to social organizations and this might probably assist them in collective tackling of any problem confronting them. This is supported by Figuerora (2008) who observed that individual that participate in dialogue and collective action can produce community level outcomes that facilitate and enhance individual behavior. Majority of the respondents (65.0%) had exposures because of their high degree of cosmopolitaness. This suggests that through their exposures, they might have gained insights into some of their problems particularly water-related problems which are more crucial in the rural communities of developing countries like Nigeria. Their exposures might also likely influence their practices or adoption of water treatment and sanitation technologies which are available within their communities.

Data in Table 2 show the respondents' distribution based on sources of water supply. Majority of the respondents (81.7%) obtained water through rainfall, well (77.5%), boreholes (64.2%) for their farming or other farming-related jobs and domestic uses. About 37.5 percent obtained water through river, 28.5 percent through streams and 23.3 percent through ponds. These findings indicated that rain, well and boreholes are the common sources of water even in the rural communities now. The situation is so, probably because of the Government and non-government organizations' intervention by taking provision of portable pipe-borne water through the sinking of boreholes, digging of wells as crucial projects. This has eventually discouraged most rural

settlers from fetching water from streams, rivers and ponds. This negates the assertion of Ushurhe (2009) cited in Ubuoh, Obeta and Eze (2014) who alluded to the fact that numerous rural communities in Nigeria are severed by one or more rivers, streams, ponds or lakes as their major sources of water supply. The results as presented in Table 3 reveal the ownership of the sources of water supply to the rural dwellers. Slightly above one-third (34.2%) of the respondents claimed the ownership of their sources of water for Non-government organizations while 25.8 percent of the respondents submitted that Governments a various levels supplied them water. Only 39.2 percent of the respondents personally claimed ownership of the source of water they used. The percentage of ownership of water supply by the communities was as low as 0.01 percent. There is therefore the need for government, non-government organizations and various communities themselves to commit more of their resources to the provision of water sources for the various uses of rural dwellers in terms of sinking of boreholes, digging of wells and provision of pipe-borne water.

The results in Table 4 indicate that more than one-third (36.7%) always treat their water with the use of chlorine and addition of alum respectively while 27.5 percent of the respondents used to boiled water before use. From the result in Table 4 also, 45.0 percent, 56.7 percent, 82.5 percent, and 59.2 percent of the respondents sometimes added chlorine, alum, filtered and boiled their water respectively before use. This indicates that rural dwellers still need to be taught how to make use of the technologies to treat their water so as to improve their health status as for effective management of available water both on and off farm. This agreed with the findings of Ubouh, Obeta and Eze (2014) which indicated that about half of the sampled population did not apply any of the water treatment technologies for its treatment. This might be as a result of their ignorance of water treatment options or technologies. Therefore, awareness of these technologies needs to be created especially among rural dwellers.

The results in Table 5 show that educational status of the respondents ($\beta=0.287$, $p<0.01$), household size ($\beta=0.142$, $p\leq 0.01$) and membership of social organization ($\beta=0.133$, $p\leq 0.01$) were variables which influenced water treatment and sanitation practices of people in the study area. For instance, the higher the educational status, the more enlightened they would be and the more treatments they would give to water they utilized. Also membership of social organizations of the household heads and household size had influence on water treatment and sanitation practices, this might be because members of social organizations and members of households influenced or promoted

adoption of water treatment and sanitation technologies in rural households in the study area.

Table 1: Distribution of respondents based on rural household heads socio-economic characteristics

Variables	Frequency	Percentage	Mean
Age			
≤ 20 years	1	0.01	
21-40 years	38	31.6	
41-50 years	34	28.3	41.0
51-60 years	35	29.2	
> 60 years	12	10.0	
Sex			
Male	75	62.5	
Female	45	37.5	
Marital Status			
Single	06	5.0	
Married	69	57.5	
Widow(er)	45	37.5	
Level of Education			
No formal education	16	13.3	
Primary education	09	7.5	
Secondary education	85	70.8	
Tertiary education	10	8.3	
Occupation			
Farming/fishing/livestock rearing	52	43.3	
Trading	24		20.0
Artisans	26		21.7
Others	18		15.0
Cosmopolitaness			
Within the village	15		12.5
With the LGA	08		6.7
Outside the LGA	02		1.7
Outside the state	78		65.0
Outside the country	17		14.2
Membership of social organization			
Yes	78		65.0
No	42		35.0
Household size			
1-6	75		62.5
7-12	39		32.5
13-15	03		2.5
>15	03		2.5
Income per annum			
≤ ₦120, 000	28		23.3
₦121, 000-₦150, 000	18		15.0
₦ 151, 000-₦200,000	49		40.5
Above ₦200, 000	25		20.5

Table 2: Distribution of the respondents based on sources of Water Supply

Sources of Water	Frequency	Percentage
Rain	98	81.7
Well	93	77.5
Stream	34	28.3
River	45	37.5
Ponds	28	23.3
Borehole	77	64.2
Total		

Source: Field Survey, 2017

Multiple responses were recorded

Table 3: Distribution of respondents based on the Ownership of Water Supply

Ownership of Source	Frequency	Percentage
Personal	47	39.2
Government	31	25.8
Non-government Organization (NGOs)	41	34.2
Community	01	0.01
Total	120	100.0

Source: Field Survey, 2017

Table 4: Distribution of the respondents based on Water Treatment and Sanitation Practices

Water Treatment and Sanitation practices	Never	Sometimes	Always
Chlorination	22 (18.3)	54 (45.0)	44 (36.7)
Addition of alum	12 (10.0)	68 (56.7)	40 (33.3)
Filtration	20 (16.7)	99 (82.5)	01 (0.01)
Solar disinfection	101 (84.2)	19 (15.8)	-
Boiling	16 (13.3)	71 (59.2)	33 (27.5)

Source: Field Survey, 2017

Percentage is parenthesis

Table 5: Regression Analysis of Factors Associated with Water Treatment and Sanitation Practices

Variables	Regression co-efficient		
	Beta (b)	t- value	p- value
Age	0.104	1.516	0.082
Sex	-0.045	-0.125	0.003
Educational status	0.287**	5.295	0.000
Household size	0.142**	2.645	0.000
Membership of social organization	0.133**	4.214	0.011

**Significant at < 0.01

$R^2 = 0.428$, $R = 0.655$, $F = 22.628$, $p \leq 0.01$

Conclusion and Recommendations

The results generated from this study revealed that the respondents' mean age was 41.0 which indicated that they were in their middle ages with married and widows dominated the area. Majority of the respondents could read and write. Rain, wells and recently boreholes were the major sources of water. Water treatment and sanitation practices observed by the respondents were chlorination, addition of alum and boiling. The major sources of water supply were personal ownership through dug wells and Non-government Organizations (NGOs) through sunk boreholes. Educational status of household heads, household size and membership of social organizations had positive relationships with water treatment and sanitation practices of the respondents.

It is therefore recommended that more organizations (Government and Non-government organizations) should put in more efforts to sensitize rural households on the importance of water treatment and sanitation practices. Also, rural people should be assisted by putting in place necessary materials and technologies which will aid water treatment and sanitation practices and cause them to have access to clean water and so improve their health status.

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