

KNOWLEDGE OF WATER QUALITY FOR DOMESTIC USE AMONG RURAL HOUSEHOLDS AROUND EWEKORO CEMENT FACTORY IN OGUN STATE, NIGERIA

¹Dada, O. E., ²Dada, V. O., ¹Alarima, C. I. and ³Adewole, A. O.

¹Department of Agricultural Extension and Rural Development, Federal University of Agriculture, Abeokuta

²Department of Water Resources Management and Agrometeorology, Federal University of Agriculture, Abeokuta

³Department of Agricultural Extension and Management, Federal College of Animal Health and Production, Ibadan

Correspondence contact details: dadaemma.gold@gmail.com

ABSTRACT

The quality of water consumed is central to proper functioning of the body system as water plays important roles in body regulation. This study assessed the knowledge of rural households on water quality parameters in Ewekoro Local Government, Ogun State. Multistage sampling procedure was used to obtain primary data on socioeconomic characteristics, sources of water for domestic use, knowledge on water quality and water purification techniques from 60 rural households heads with the aid of interview schedule. Data were analysed with the use of percentage, frequency count and mean. Result showed that 55.0% of the respondents were female with mean age of 48 years and average household size of 4 persons. Result further showed that most (73.3%) of the respondents were married while 33.3% had secondary education. About 91.7% and 75% sourced their drinking water from community borehole and streams respectively. The overall score on knowledge showed that 100.0% of the respondents had high knowledge of water quality parameter for drinking purpose. The result further showed that 53.3% and 58.3% made use of boiling and alum as means of water purification prior to drinking. The study concluded that the rural households in the study area had high knowledge of water quality which also reflected in their water purification technique. It is recommended that water from stream, river, well and borehole should always be treated before consumption to avoid drinking contaminated water.

Keywords: Water quality, Rural household, Domestic use, rural health, water purification

INTRODUCTION

Water is a natural resource that is useful for developmental purposes both in the rural and urban areas (Adejuwon and Adelokun, 2012). The indispensability of water for man's use has made it one of the most important natural resources required for man's existence. Aside its role in agriculture, industrial and domestic purposes, it also plays important role in maintaining man's body osmoregulation thereby making it an essential nutritional need of humanity. This characteristic feature becomes an important subject of concern to rural development experts on the quality of water consumed by rural dwellers.

Access to safe water contributes immensely to the well being of an individual. Consumption of contaminated water poses great health risk and leads to various diseases such as dysentery, cholera, diarrhea among others (Adejuwon and Adelokun, 2012). Rural areas in Nigeria have limited access to safe and uncontaminated water for drinking leading to poor water sanitation and hygiene (Akoteyon, 2019). They rely on rivers and streams as source of water for domestic purposes (Nkwocha, Ikoru, Ude and Nwachi, 2017) which are infected with anthropogenic discharges (Ajai *et al.*, 2011). The health being of rural dwellers in Nigeria is influenced by the quality of water consumed. There are various causes of water contamination in Nigeria. Activities of man such as residues discharge from pesticide application, refuse and other discharges from industries (Omole and Isiorho, 2011) tamper with surface water thereby

making it unfit for consumption without treatment. Consumption of this kind of untreated water will be harmful to the collective health status of rural communities such as a case reported by Omole *et al* (2015) that there exists a link between drinking of polluted water and health problems.

An environmental impact assessment on the consequences of cement production by Lafarge cement factory in Ewekoro local government in Ogun State by Abdus-Salam and Adeoye (2019) showed that the surface water samples displayed higher values of some heavy metals contents than the standards proposed by WHO, EPA, NAFDAC and SON which are as a result of anthropogenic activities. The submission of Meo (2004) and Baby *et al* (2008) also showed that dusts emitted from cement production contains contaminants harmful to life.

Studies on water quality had been carried out in the study area by researchers such as Oluseyi, Olayinka and Adeleke (2011); Abdusa-Salam and Adeoye (2019). Aside the contamination of the surface water, occurrence of natural physico-chemical characteristics can also affect the underground water (Abdus-Salam and Adeoye, 2019). This affects water from the boreholes and wells. Understanding of the knowledge and practice of water quality among rural households will guide in formulating policies that will guide consumption of safe water.

Having established the presence of contaminants in water bodies around communities near Ewekoro Cement factory by other researchers, this study however examined the knowledge of rural



dweller in the community on their knowledge of water purification, sources of water for drinking purposes and water purification techniques employed.

METHODOLOGY

The study was carried out in Ewekoro local government area of Ogun State, Nigeria. It is one of the twenty local governments in the State bounded in the North by Abeokuta and Ifo in the South. It lies between the Latitude of 6.2 and 7.8°N and Longitude 3.0 and 5.0°E. The inhabitants were farmers, traders, civil servants, and artisans.

The study employed Multistage sampling procedure to select the respondents. Stage one involved purposive selection of Ewekoro Local government due to the presence of Cement Factory which is believed to affect the water bodies in the nearby communities. In stage two, there was purposive selection of five communities closest to the Cement Factory. Stage three involved random selection of twelve (12) household heads in each of the five communities to make a total of sixty (60) respondents.

The socioeconomic characteristics such as sex was measured at nominal level as Male =1, female =2; age was measured in actual years; educational level was measured at ordinal level as No formal education =1, First School Leaving Certificate =2, Senior School Certificate =3 and

Tertiary education =4; knowledge of the respondents was measured at ordinal level as Yes (1) and No (0). Method of water treatment was measured at nominal level as boiling (1), Addition of alum (2), Herbal method (3), No method (4) and Chlorination (5). Primary data were collected using interview schedule. The objectives were analysed using descriptive statistics while the hypothesis was tested using regression analysis.

RESULTS AND DISCUSSION

Socioeconomic characteristics

The result presented in Table 1 showed that 55.0% of the respondents were female while 45% were male. This shows that both men and women were well represented in the sampling while the higher number of the female sex suggests that the communities were dominated by women. Also, the result showed that the average age of the respondents was 48 years. This indicates that they were still active and agile and possessed the strength to pull resources together to achieve communal goals as submitted by Iwuchukwu *et al* (2015) that people in their youthful age are energetic and can bring about infrastructural development in their communities. The educational status of the rural households showed that about 33.3% had no formal education. This shows that the literacy level among the rural households was low.

Table 1: Socioeconomic characteristics of rural households in the study area (n=60)

Socioeconomic	Frequency	Percentage	Mean
Age			47.6 years
Sex			
Male	27	45	
Female	33	55	
Marital status			
Single	4	6.7	
Married	44	73.3	
Divorced	12	20.0	
Education			
No formal	20	33.3	
Primary education	18	30.0	
Secondary education	14	23.3	
Tertiary	8	13.3	
Household size			4 persons

Source: Field survey, 2020

Sources of water used in the study area

The result in Table 2 showed that borehole (91.7%) and stream (75.0%) were the main sources of water used for drinking and other domestic purposes in the study area. The boreholes according to the respondents were constructed by the government and through the collective efforts of the inhabitants of the communities. This shows that the rural communities have a way of pulling resources

together to provide needed infrastructures. However, they switched to the use of streams whenever there is no electricity to power the borehole. That the rural people depend on river and stream was supported by the submission of Nwokocha *et al* (2017) who established that the main source of drinking water in rural areas was stream and river.

Table 2: Sources of water for drinking purpose in the study area (n=60)

Sources of water	Yes(%)	No (%)
Borehole	91.7	8.3
Tap water	21.7	78.3
Stream/ river	75.0	25.0
Well water	33.3	66.7
Rainwater	25.0	75.0

Source: Field survey, 2020

Knowledge of the respondents on water quality

Tables 3a and 3b showed that all the respondents had proper knowledge on the basic physical feature of pure water such as being colourless (100.0%), odourless (100.0%) among others. They also had knowledge that a pure water should be free of germs and that it promotes good health. Therefore, the categorisation of their

knowledge as presented in Table 3b showed that they had high knowledge of water quality for domestic use. This could be influenced by their exposure to formal education while the ones without formal education could have learned about the basic physical properties of to be judged as fit for human consumption.

Table 3a: Knowledge of the rural households on water quality (n=60)

Knowledge	True (%)	False (%)
Pure water is free of germs	100	0.0
Good water is colourless	100	0.0
Pure water is odourless	100	0.0
Pure water has taste	10	90.0
Source of water does not determine its quality	13.3	86.7
Impure water should be purified	100	0.0
Good water promotes good health	100	0.0
Pure water can contain some impurities	3.3	96.7
There is no need to purify water	13.3	86.7
Impure water causes diseases	100	0.0
Poor water quality can damage body tissues	100	0.0
Stagnant water is good for drinking	6.7	93.3

Source: Field survey, 2020

Table 3b: Categorisation of the respondents into high and low knowledge on water quality (n=60)

Categorisation	Frequency	Percentage	Min.	Max.	Mean
High (19-36)	60	100.0	12.0	36.0	18.0
Low (12-18)	0	0.0			

Source: Field survey, 2020

Purification techniques used by the respondents

Table 4 revealed that boiling of water (46.7%) and the use of alum (41.7%) were the methods commonly used by the respondents to purify water prior to consumption. It is commendable that the rural households based on their knowledge of water quality took step purify

water, however, the percentage of those purifying is low compared to their knowledge of water quality. This implies that knowledge alone is not power but the applied knowledge. The assertion of Ibrahim *et al* (2017) showed that rural people had low level of water purification.

Table 4: Water purification techniques used by the rural households in the study area (n=60)

Purification technique	Yes (%)
Boiling	46.7
Addition of alum	75.0
Herbal method	0.0
None	15.0

Source: Field survey, 2020

CONCLUSION AND RECOMMENDATIONS

The study concluded that the rural household had high knowledge of water quality and that their age and educational status influenced their

knowledge of water quality. However, despite their knowledge of water quality parameters, only few of the rural households made step further to purify water before drinking. It is recommended that rural



households in the study area should always purify their water from any source due to the expected impurities in the water body due to the Cement factory in the area.

REFERENCES

- Abdus-Salam, N. and Adeoye, A. O. (2019). Assessment of impact of industrial discharge on the quality of water around Lafarge Cement WAPCO, Ewekoro, Nigeria. *Jewel Journal of Scientific Research*, 4 (1&2): 44-45.
- Adejuwon, J. O. and Adelakun, M. A. (2012). Physicochemical and bacteriological analysis of surface water in Ewekoro Local Government area of Ogun state, Nigeria: Case study of Lala, Yobo and Agodo rivers. *International Journal of Water Resources and Environmental Engineering*, 4(3): 66-72.
- Ajai, A. I., Jacob, J. O., Ndamitso, M. M. and Abdulgafar, J. (2011). Physicochemical characteristics and trace metal levels of locally dug wells in Tunga area of Minna, Nigeria. *Journal of Applied Science and Environmental Management*, 15 (2): 247-250.
- Aketeyon, I. S. (2019). Inequalities in access to water and sanitation in rural settlements in parts of Southwest Nigeria. *Ghana Journal of Geography*, 11(2): 158-184.
- Baby, S., Singh, N. A., Shrivastava, P., Nath, S. R., Kumar, S. S., Singh, D. and Vivek, K. Impact of dust emission on plant vegetation of vicinity of cement. *Environmental Engineering and Management Journal*, 7(3): 79-84.
- Chaurasia, S. and Tiwari, A.K. (2016). A review of traditional water purification used in rural area. *Indian Journal of Environmental Protection*, 36(1): 43-46.
- Ibrahim, J. M., Suflyan, B. M., Olorukaoba, A. A. Gobir, A. A. Adam, H. And Amadu, L. (2017). Knowledge, attitudes and practices of household water purification among caregivers of under-five children in Biye community, Kaduna state. *Arch Med Surg* 2017; 1: xx-xx.
- Iwuchukwu, J. C., Ogbonna, O.I. and Agboti. I.O. (2015). Roles of youth groups in rural development in Ebonyi state, Nigeria. *Journal of Agricultural Extension and Rural Development*, 7 (2): 41-47.
- Meo, (2004). Health hazards of cement dust. *Saudi Medical Journal*, 1153-1159.
- Nwokocha, E. E., Ikoru, U. A., Ude, D. A. and Nwachi, C. C. (2017). *International Journal of Scientific and Engineering Research*, 8 (5).
- Oluseyi, T., Olayinka, K. and Adeleke, I. (2011). Assessment of groundwater pollution in the residential areas of Ewekoro and Shagamu due to cement production. *African Journal of Environmental Science and Technology*, (10): 786-794.
- Omole, D. O. and Isiorho, S. A. (2011). Waste management and water quality issues in coastal states of Nigeria: The Ogun state experience. *J. Sustain. Dev. Afr.*, 13(6):207-217
- Omole, D. O., Ndambuki, J. M. and Balogun, K. O. (2015). Consumption of sachet water in Nigeria: Quality, public health and economic perspectives. *African Journal of Science, Technology Innovation Development*, 7(1): 45-51
- Raghupathi, V. and Raghupathi, W. (2020). The influence of education on health: an empirical assessment of OECD countries for the period 1995-2005. *Arch Public Health* 78, 20 (2020). <https://doi.org/10.1186/s13690-020-00402-5>