

## ASSESSMENT OF WATER SUPPLY, SANITATION AND HYGIENE PRACTICES AMONG HOUSEHOLDS IN SOUTHERN NIGERIA

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**ABSTRACT:** *Cross River State recorded that 46.4% and 42.1% are still using unimproved source of drinking water and sanitation facilities respectively, leaving about 100 million people without access to improved sanitation? The aim of this study was to assess water supply, sanitation and hygiene practices among households in Akpabuyo Local Government Area, Cross River State, Nigeria. A descriptive cross-sectional study was adopted for the study. Data were generated using a semi-structured questionnaire from 400 respondents which were selected using multi-stage sampling technique. An observational checklist was used to conduct an assessment of the availability, functionality and use of WASH facilities. Data generated were synthesized, entered and analyzed using Statistical Package for Social Sciences (SPSS Version 24.0) and results were presented in simple percentages, tables and charts. The result obtained in this study showed that 172 (43.0%) households have access to improved drinking water source and borehole with hand pump was the main source of water supply for households. Type of toilet facilities use in households were mainly; pit latrine 190 (47.5%) and swat flush 85 (21.2%). Method of household solid waste disposal were mainly; open dumpsite 166 (41.5%), burning 101 (25.3%) and throwing into the bush 81 (20.3%). Most respondents 386 (96.5%) practice hand washing mostly after eating, 318 (79.5%) before eating and 284 (71.0%) after handling children's faeces. It was also observed that 357 (89.2%) houses had no drainage system, 313 (78.3%) have waste storage facility, 325 (81.3%) have refuse dumpsite and 358 (89.5%) did not have odour of excreta in the surrounding. It was recommended that rural communities should synergize with government at all levels and other relevant stakeholders to ensure adequate provision of WASH facilities in their communities.*

**KEYWORDS:** water, sanitation, hygiene practice, hand washing, households

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### INTRODUCTION

The provision of Water, Sanitation and Hygiene (WASH) facilities in their correct quantity and

quality are amongst the five key approaches aimed at combating Neglected Tropical Diseases (NTDs) and other fecal-oral transmitted diseases (World Health Organization (WHO) and United Nations International Children's Education Fund (UNICEF), 2015). In many Low and Middle Income Countries (LMICs), access to WASH facilities has improved tremendously but still far from achieving the Sustainable Development Goal (SDG) targets. For instance, global report showed that the use of improved drinking water sources increased from 76 percent in 1990 to 91 percent in 2015, use of improved sanitation increased from 54 percent in 1990 to 68 percent in 2015 and the global prevalence of handwashing with soap after contact with excreta is 19 percent; rates are lower in Sub-Saharan Africa (14 percent) and South-East Asia (17 percent) (WHO and UNICEF 2015b).

Global statistics has also shown that over 1.8 billion people use unimproved drinking water which consequently increases the risk of contracting diseases such as polio, diarrhea, typhoid, dysentery, cholera and other water-borne diseases (WHO and UNICEF, 2015). Estimates from World Health Organization further reports that poor access to WASH facilities have been linked to 10% of total disease burden and 94% of diarrheal burden. According to the Nigeria Health Demographic Survey (NDHS) (2019), Cross River State recorded that 46.4% and 42.1% are still using unimproved source of drinking water and sanitation facilities respectively, leaving about 100 million people without access to improved sanitation.

In Nigeria, high rates of illness and death among children under five years of age has been linked to poor access to WASH facilities. Over 70,000 children under five years die annually as a result of their increase vulnerability to water-borne disease. Estimates has shown that over 73% of enteric disease and diarrheal disease burden is largely associated with poor access to WASH facilities (UNICEF 2018). The practice of open defecation and use of inadequate communal latrine often results from lack of access to improved sanitation facilities. These practices predisposes women and girls to sexual assault and abuse in their immediate environments especially in very remote areas. Beyond the community, the lack of effective waste disposal or sewage systems can degrade the ecosystem and fuel disease outbreaks (UNICEF, 2015). It has been documented that approximately 892 million people still practice open defecation and 61.5% use unimproved toilet facilities such as hanging latrine, bucket, open pit, pit latrine without slabs, pit latrines (WHO & UNICEF, 2017).

Access to improved WASH facilities do not only improve the health condition of the people, but also positively affects the economy of a country as ill-health drastically affects labour, productivity and earning potential of individuals. For instance, in India, water borne diseases cost \$600 million annually due to loss of production and medical treatment (WHO & UNICEF, 2012). Aside, diarrhea and cholera, other WASH related diseases include malaria, hookworm diseases, trichuriasis, ascariasis, schistosomiasis, trachoma and Japanese encephalitis which contribute significantly to the country's disease burden. Additionally, statistics also show that children bear the greatest share of this health burden where WASH accounts for 7% of total disease burden and 19% of child morbidity and mortality globally (Bartram and Cairncross, 2010). Orimoloye et al (2015) asserted that separating issues related to WASH from health and overall wellbeing of individuals is practically impossible. The sustenance of life and promoting of health is significantly

reliant on access to improved WASH facilities to meet the benchmark of the Sustainable Development Goal target by 2030. This therefore, necessitated the assessment of Water, Sanitation and Hygiene practice among households in Akpabuyo LGA, Cross River State, Nigeria.

### **Aim of the study**

The aim of this study is to assess water supply, sanitation and hygiene practices among households in Akpabuyo Local Government Area Cross River State, Nigeria. Specifically, this study seeks to;

1. identify sources of water supply in selected communities in Akpabuyo Local Government Area;
2. determine the types and availability of toilets facilities used by households in the study area;
3. determine the methods of solid waste disposal among households in the study area; and
4. determine the level of hand washing practice among respondents in the study area.

### **METHODOLOGY**

The study area is Akpabuyo Local government Area (LGA) of Cross River state. The LGA has an area of 1,241 km<sup>2</sup> and a projected population from 272,262 persons in 2006 to 363,900 persons (NPC, 2016). Akpabuyo constitute 10 political wards and is situated in the southern senatorial district with headquarters at Ikot Nakanda. The major language spoken are Efik and English, while all the major ethnic groups share a common culture and ancestral heritage. The people of Akpabuyo are major producer of Cassava, cow, yam, kola nut, coconut, palm produce as well as sea foods. Residents of Akpabuyo are mostly farmers, traders and civil servants (Osonwa, Eko, & Ema, 2016). The LGA is rich in forest resources which comprises several species of wood that can supply large scale furniture and building ventures for both domestic consumption and export. The area lies within the vegetation belt of southern Nigeria and shares the Atlantic coastline with Bakassi to the east and the republic of Cameroon to the West. A descriptive cross-sectional study design was adopted and used for the study. A multi-stage sampling technique was used to select 400 respondents (18 years & above) from 400 households. A pre-tested, semi-structured questionnaire was used to generate data from the respondents while an observational checklist was used to conduct an assessment of the availability, functionality and use of WASH facilities in the study area. About 10% of the questionnaire was ascertain for validity (using face validity method) and reliability (test-retest method). Descriptive statistics was used to analyze the data obtained from the respondents. The responses were coded and analyzed. Data were analyzed using Statistical Package for Social Sciences, (SPSS, version 24.0) and results were presented in frequency tables and chart. Authorization to conduct the research was obtained from Cross River State Ethics Research Committee, Ministry of Health. Informed consent was duly sought and obtained from the respondents and participating community heads. Anonymity and confidentiality of information obtained was maintained through the period of research.

## RESULTS

### Socio-demographic characteristics of the respondents

All 400 copies of the questionnaire were returned for analysis giving a response rate of 100%. The results obtained shows that 212 (53.0%) were females, 170 (42.5%) were aged 26-35 years, 212 (53.0%) were married, 181 (45.3%) had secondary education, 127 (31.8%) were farmers and 382 (95.5%) practice Christianity (Table 1).

### Source of water supply, water storage and water treatment for households

aOf the 400 respondents, 172 (43.0%) indicated that they have access to potable water. Main source of water supply as indicated by the respondents includes; borehole with hand pump 142 (35.5%), stream/river/well 110 (27.5%) and rainwater 100 (25.0%). While 277 (69.3%) respondents indicated that water is mainly stored in plastic container, 154 (38.5%) indicated that they clean their water storage container every two weeks. Though 140 (35.0%) respondents affirmed that they do not treat water before usage, 121 (30.3%) uses the filtration method to treat water for household consumption (Table 2).

### Types of toilet facilities used among the respondents

Type of toilet facilities use in households as indicated by the respondents mainly include; pit latrine 190 (47.5%) and swat flush 85 (21.2%). Of the 44 respondents who indicated that they have no toilet facility, bush 35 (79.0%) was indicated as the alternative place of defecation for households (Table 3).

**Table 1: Socio-demographic characteristics of the respondents (n=400)**

Variables	Number of respondents	Percentage
<b>Sex</b>		
Male	188	47.0
Female	212	53.0
<b>Age</b>		
<26	34	8.5
26-35	170	42.5
36-45	107	26.7
46+	89	22.3
<b>Marital status</b>		
Single	181	45.3
Married	212	53.0
Divorce	2	0.5
Widow/widower	5	1.2
<b>Educational status</b>		
Primary	71	17.8
Secondary	181	45.3
Tertiary	84	21.0
Adult education	22	5.5
No formal education	42	10.5
<b>Occupational status</b>		
Farmer	127	31.8
Civil/public servant	67	16.8
Artisans	58	14.5

Business/trader	81	20.3
Unemployed	67	16.8
<b>Religion</b>		
Christianity	382	95.5
Islam	2	0.5
Traditional religion	16	4.0

**Table 2: Source of water supply, water storage and water treatment for households**

<b>Variables</b>	<b>Number of respondents</b>	<b>Percentage</b>
<b>Have access to potable water</b>		
Have access	172	43.0
Do not have access	228	57.0
<b>Total</b>	<b>400</b>	<b>100</b>
<b>Main source of water supply</b>		
Stream/river/well	110	27.5
Borehole with hand pump	142	35.5
Public tap	30	7.5
Rainwater	100	25.0
Spring	18	4.5
<b>Total</b>	<b>400</b>	<b>100</b>
<b>Method of water storage</b>		
Plastic container	277	69.3
Clay pot	47	11.7
Drum	76	19.0
<b>Total</b>	<b>400</b>	<b>100</b>
<b>Frequency of cleaning water storage container</b>		
Every week	106	26.5
Every two weeks	154	38.5
Every three weeks	140	35.0
<b>Total</b>	<b>400</b>	<b>100</b>
<b>Method of water treatment</b>		
No treatment method use	140	35.0
Filtration	121	30.3
Sedimentation	60	15.0
Chlorination	31	7.7
Boiling	48	12.0
<b>Total</b>	<b>400</b>	<b>100</b>

**Table 3: Types of toilet facilities used among the respondents**

<b>Variables</b>	<b>Number of respondents</b>	<b>Percentage</b>
<b>Type of toilet facility use in household</b>		
Pit latrine	190	47.5
Swat flush latrine	85	21.2
Water system closet	81	20.3
No toilet	44	11.0
<b>Total</b>	<b>400</b>	<b>100</b>
<b>Alternative place of defecation for households without toilet facilities</b>		
Bush	35	79.0
Neighbour's latrine	5	11.4
Polythene bag	3	6.8
Container	1	2.3
	<b>44</b>	<b>100</b>

**Method of solid waste disposal among respondents**

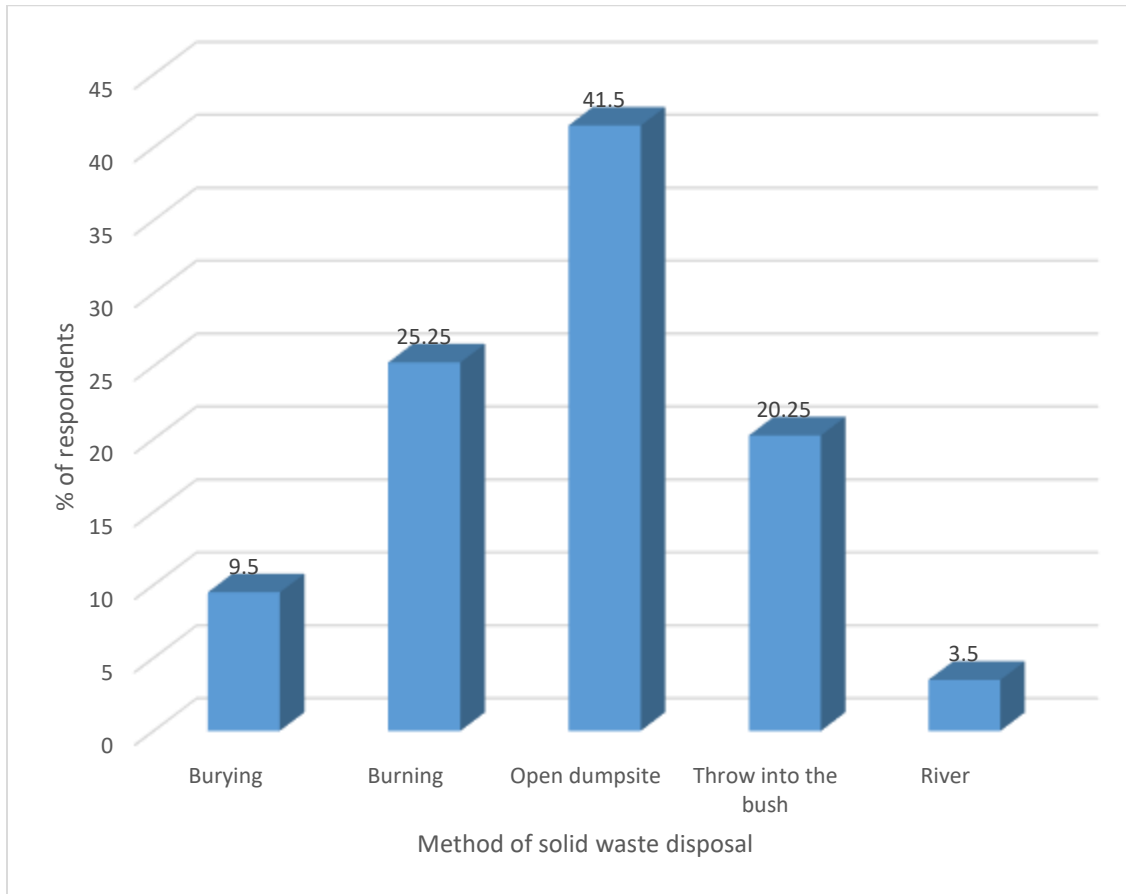
Method of solid waste disposal as indicated by the respondents were mainly; open dumpsite 166 (41.5%), burning 101 (25.3%) and throwing into the bush 81 (20.3%) (Figure 1).

**Hand washing practice among respondents**

Results on hand washing practice shows that a reasonable proportion of the respondents 386 (96.5%) practice hand washing mostly after eating, 318 (79.5%) before eating and 284 (71.0%) after handling children's faeces. Method of hand washing practice was mostly with only water 232 (58.0%) while 168 (42.0%) indicated that they wash their hands with water and soap/detergent (Table 4).

**Assessment of water supply, sanitation and hygiene facilities in households**

Results on assessment of WASH facilities in households shows that of the 400 households surveyed, 234 (62.7%) houses were mainly made with mud plastered with cement, 357 (89.2%) houses had no drainage system, 313 (78.3%) have waste storage facility, 190 (47.5%) mostly have pit latrine, 172 (43.0%) have access to improved water source, 325 (81.3%) have refuse dumpsite and 358 (89.5%) did not have odour of excreta in the surrounding (Table 5).



**FIG 1: Method of solid waste disposal among respondents**

**Table 4: Hand washing practice among respondents**

Variables	Number of respondents	Percentage
<b>Period when hand washing is usually practice*</b>		
Before cooking	231	57.8
Before eating	318	79.5
After eating	386	96.5
After going to toilet	193	48.3
After daily activities	183	45.8
After handling children's faeces	284	71.0
<b>Method of hand washing practice</b>		
Water only	232	58.0
Water with soap or detergent	168	42.0
<b>Total</b>	<b>400</b>	<b>100</b>

\*Multiple responses

**Table 5a: Assessment of water supply, sanitation and hygiene facilities in households**

<b>Variables</b>	<b>Number of respondents</b>	<b>Percentage</b>
<b>Types of housing</b>		
Mud	31	7.8
Mud plastered with cement	234	62.7
Block	61	18.0
Wooden-made	46	11.5
<b>Total</b>	<b>400</b>	<b>100</b>
<b>Presence of drainage system</b>		
Available	43	10.8
Not available	357	89.2
<b>Total</b>	<b>400</b>	<b>100</b>
<b>Sanitary condition of drainage system</b>		
Sanitary	8	18.6
Unsanitary	35	81.4
<b>Total</b>	<b>43</b>	<b>100</b>
<b>Availability of waste storage facility</b>		
Available	313	78.3
Not available	87	21.7
<b>Total</b>	<b>400</b>	<b>100</b>
<b>Sanitary condition of waste storage facility</b>		
Sanitary	113	36.1
Unsanitary	200	63.9
<b>Total</b>	<b>313</b>	<b>100</b>
<b>Type of toilet facility available</b>		
Pit latrine with cover	120	30.0
Pit latrine without cover	70	17.5
Swat flush	85	21.2
Water system closet	81	20.3
No toilet	44	11.0
<b>Total</b>	<b>400</b>	<b>100</b>
<b>Sanitary condition of toilet facility</b>		
Sanitary	114	32.0
Unsanitary	242	68.0
<b>Total</b>	<b>356</b>	<b>100</b>



**Table 5b: Assessment of water supply, sanitation and hygiene facilities in households contd.**

<b>Variables</b>	<b>Number of respondents</b>	<b>Percentage</b>
<b>Sanitary condition of bathing facility</b>		
Sanitary	74	18.5
Unsanitary	326	81.5
<b>Total</b>	<b>400</b>	
<b>Availability of water supply</b>		
Available	400	100
Not available	0	0.0
<b>Total</b>	<b>400</b>	<b>100</b>
<b>Status of water source</b>		
Improved	172	43.0
Unimproved	228	57.0
<b>Total</b>	<b>400</b>	<b>100</b>
<b>Presence of refuse dump</b>		
Present	325	81.3
Absent	75	18.7
<b>Total</b>	<b>400</b>	<b>100</b>
<b>Odour of excreta in the surrounding</b>		
Present	42	10.5
Absent	358	89.5
<b>Total</b>	<b>400</b>	<b>100</b>

## DISCUSSION OF FINDINGS

The provision of WASH facilities is essential to promote healthiness, improve hygiene standards and accelerate socio-economic development. Ample evidence have shown that Nigeria and other developing countries have progressively achieve universal access to WASH facilities over the past decade, but significant challenges still exist regarding the maintenance, standard requirements, functionality of WASH facilities in households (Orimoloye et al, 2015; Girsha et al, 2016; Kaoje, et al, 2019). As a result of these existing challenges, individuals are often vulnerable to contracting WASH-related infectious diseases leading to increase rate of disease morbidity and mortality.

In the current study, less than half of the respondents indicated that they have access to potable water. This result is comparable with that of Eneh (2007) where access to potable water was perceived to be the greatest problem in the study. This clearly shows that access to potable water is still a major challenge especially in rural settings. It is possible that households with in-house water supply or households who get water from a centralized sources (e.g. borehole with hand pump) may significantly account for those who reported to have access to potable water as it is perceived to be an improved water source. Main source of water supply for households were mainly borehole with hand pump and stream/river/dug well. This results is congruent with a

Ghanaian study where similar source of water were reported (Addo et al, 2014), but contradicts a Nigerian study where river/stream was their main source of drinking water (Kaoje et al, 2019). This is common in rural areas where water source are situated in strategic locations within the communities for easy accessibility. Some households also have dug-well which serves as reservoir for private use especially in cases where water is urgently needed. Access to water in streams/river largely takes place when the borehole hand pump is overpopulated at a particular point in time or non-functional or water in the dug-well dries-up. In rare cases, it is commonly observed that a particular household may have multiple sources of water even though borehole hand pump remains their main source.

It was also documented that over two-third of the respondents mainly store their drinking water in plastic containers, of which only one-third reported that they clean their water storage container every two weeks. This indicates poor hygiene practice among households. Cleaning water storage container is imperative to avoid water contamination and promote disease prevention. Though one-third respondents affirmed that they do not treat water before usage, 121 (30.3%) uses the filtration method to treat water for household consumption (Table 2). This finding agrees with that of Venkatashiva et al (2017) where two-third of the households surveyed did not treat their water before use. The absolute absence of water treatment plan may be linked to the fact that respondents may have already considered the water source safe for drinking (e.g water from borehole with hand pump). This was confirmed in a recent study conducted by Kaoje et al (2019) where 97% of respondents perceived water source safe for drinking. Lack of knowledge of available water treatment methods may also account for why water is not treated before use. However, filtration was the most adopted method for water treatment. This has been one of the commonest methods of water treatment in rural areas due to its easy approach, convenience and requires little or no cost to carry out the procedure.

Nearly half of the households use mostly pit latrine followed by swat flush (Table 3). This finding contradicts a study conducted in Ibadan which documented that pour flush toilet was the most used type of toilet facility (Orimoloye et al, 2015). This result is not surprising because, pit latrine is widely used in rural areas mainly due to its cost-effectiveness in construction and maintenance. However, it was observed that the hygiene standard of toilet facilities in most households were very poor (Table 5a). Households without toilet facilities defecate in open fields (i.e. bushes). The wide practice of open defecation continually degrades the environment, contaminates water bodies and enhance disease transmission.

While it was confirmed that over two-third of households have a waste storage facility, method of solid waste disposal reported were mainly; open dumpsite, burning and throwing into the bush (Figure 1). This finding is in accordance with that of Girsha et al (2016) where over two-third of the households dispose their waste at open dumpsite. Disposing waste in open dumpsite often encourage environmental pollution, emission of offensive odour, flies and rodent infestation as well as littering of waste within the surrounding. It is essential for households to adopt a more appropriate method of waste disposal so as to avert the adverse health consequences that comes with indiscriminate disposal of waste.

Regarding hand washing practice, a greater proportion of the respondents practice hand washing mostly after eating, before eating and after handling children's faeces. This is largely linked to the common knowledge of avoiding disease transmission that can be fuel via dirty hands. Since the hands are used in most cases for eating/feeding, it is mandatory for both hands to be clean. This may account for why hand washing is largely practiced before and after eating. This results corroborates with that of Orimoloye et al (2015) where hand washing was mainly practice after eating. More than half of the respondents wash their hands with only water while 168 (42.0%) indicated that they wash their hands with water and soap/detergent (Table 4). This results was similarly reported by Orimoloye et al (2015) and Kaoje et al (2019) where hand washing practice was poorly reported. This implies that the practice of proper hand washing with soap and water is less emphasized among rural dwellers. Lack of knowledge of the implications of proper handwashing practice on health may account for their poor practice. It was also observed that over two-third of the respondents had no drainage system. This significantly encouraged indiscriminate disposal of waste waters which consequently result in flies' infestation, emission of unpleasant odour around the environment as well as attraction and proliferation of insects/mosquitoes/rodents.

## CONCLUSION AND RECOMMENDATIONS

Improving environmental sanitation largely requires adequate availability and accessibility of WASH facilities. Lack of accessibility to WASH facilities perpetuates the cycle of poverty, disease outbreaks and underdevelopment in any polity. Findings in the current study confirmed a significant lack of access to improved WASH facilities and handwashing practice was poorly reported. It was also observed that the hygiene standard of available WASH facilities was poor. Hence, rural communities should synergize with government and other relevant stakeholders to ensure adequate provision of WASH facilities in their communities. Environmental health officers should routinely engage in monitoring households to ensure that every household have essential WASH facilities with improved hygiene standards and as well sanction any defaulters where applicable. Community stakeholders should liase with the government at all level to ensure that a significant number of households in their communities have access to potable water and establish a more acceptable method for solid waste disposal. Also, a state-wide assessment on availability and accessibility of WASH facilities should be conducted intermittently to track the progress of achieving the universal targets on improve sanitation and environmental sustainability.

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