

Assessment of Household Water quality, Sanitation, and Hygiene Management in Odugbo and its Environs a Rural Community in Benue state, Nigeria.

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Abstract

Differences between Water quality, Sanitation, and Hygiene (WASH) in the rural and urban areas have hindered meaningful development in Nigeria. Data available in recent times on this, is required in our bid to to proffer solutions to this menace effectively. This study is aimed at gathering data on the status of household WASH facilities in a remote village in Odugbo, Apa L. G. A. of Benue State, Nigeria. The survey was cross-sectional in design, and total sampling used to select 40 household respondents per village and five villages were covered in the study. Data were obtained via observational checklists, questionnaire, and key informant interview guide. Data was entered and analyzed using SPSS 20. Descriptive statistics like measuring the respondent's percentage were used. The respondents had a mean age of 43.1 ± 16.4 years, only 10.9% had tertiary education. All the respondents reported that well water and river water were their primary drinking water source which are a times supplemented with rain water and sachet water, as water are a bit scarce in dry seasons. In over 70% of households, females were assigned the duty to fetch water, some households had well within 30 minutes from their houses. In toilet availability (21.5%) of the respondents owned pit latrine, of which only 10% shared their facilities with other households. Some good numbers of people (46.8%) of the respondents still practised open defecation at instances they could not access their household latrines. Due the inadequacies of toilet facilities in the area, disposals children faeces is a challenge as a high percentage of the respondent (83.2 %) dispose their children faecal waste indiscriminately. It was observed from the results obtained that 90 % of the respondents had waterborne diseases ailment more than twice in the past one year and that diseases such as Typhoid fever, Diarrhoea, Dysentery, Cholera and Malaria fever with 26.4%, 18.3%, 16.9%, 14.5% and 23.9% in that order respectively. Almost all the toilets has no water for hand washing. The condition of water and sanitation in the village was quite progressive. However, subsequent interventions should ensure the provision of motorized boreholes and well water with pumps to help in lessening the contamination that arise from manual fetching of the well water, toilet facilities are not available in non-household settings like farms and markets which call for attention as such circumstances encourages open defaecation.

Keywords: Water, water quality; sanitation and hygiene; water supply.

Introduction

Water, sanitation, and hygiene (WASH) practices are crucial for individual and community health. Access to safe drinking water, proper sanitation facilities, and consistent hygiene habits encompass necessities for mitigating the spread of diseases, improving overall well-being, and strengthening health policy implementation. From regular hand washing to ensuring safe waste disposal, these seemingly simple practices profoundly impact lives worldwide. While comprehensive WASH coverage

is critical to enhancing the standard of living, in 2022, an estimated 2.2 billion people globally lacked potable water (UNICEF & WHO, 2019).

Sustainable Development Goal (SDG) 6 aims to 'Ensure availability and sustainable management of water and sanitation for all' and comprises WASH-related indicators such as population open defecation practice and household accessibility to basic WASH services. So far, the achievement of this global goal has been marred with disparities. As of 2017, it was estimated that 758 million people were without access to safely managed drinking water services. Around 3.5 billion people lacked access to safely managed sanitation services, while 3 billion people had no access to essential hand wash services at home (UNICEF & WHO, 2019)

The disparities between low-income and high income countries and between urban and rural regions have been clearly revealed. Based on a WASH Watch report (UNICEF; 2017) in 2017, around 94% of the population in Northern America and Europe had access to safely managed drinking water. Only around 24% of the population in Sub Saharan Africa (SSA) had such access. The SSA region has been estimated to have the highest number of people without access to safe water .

Furthermore, a report by the United Nations Children's Fund and World Health Organization (WHO, 2019) revealed that nine from every ten persons that lacked access to basic water services resided in rural areas. Also, nine out of every ten open defectors resided in the rural area (UNICEF & WHO, 2019).

Narrowing the situation to Nigeria, the situation seems despicable. In September 2018, the Nigeria Government declared Emergency in the WASH sector due to the deplorable state of her Water, Sanitation, and Hygiene services. The relatively poor progress the country has made can be seen from the fact that only 27% of the Nigerian population used improved drinking water sources and sanitation facilities, while 23.5%

of her citizens practised open defecation, making Nigeria the global capital of open defecation (Water Aid, 2015.,Ezeh et al., 2014 & Wardlaw et al., 2010). Around 64,000 under-5 children in Nigeria have been estimated to die yearly due to the lack of access to safe water, sanitation, and poor hygiene practices (UNICEF; 2017). The vulnerable groups have also been identified as those living in low-income and rural areas (NDHS (2013.)). Studies recently conducted among rural schools in Southwestern Nigeria reported a paucity of WASH facilities. Only 15% of the available school sanitation facilities provided basic sanitation service, while none of the hand wash facilities provided basic hygiene service. Also, the open defecation rate among students in the community was over 35%, while only 10% of the schools were open defecation free (Wada et al.,2020., Wada & Oloruntoba, 2021).

Another study that assessed WASH facilities in 5 communities in Northern Nigeria reported that over half of the respondents' major drinking water source was surface water, while over 75% used pit latrines. The open defecation rate in the communities was estimated to be around 41% (Sridhar et al., 2020). Furthermore, an exploratory survey recently conducted to assess WASH inequalities in Sub Saharan Africa revealed that the disparities between rural and urban communities in the region are still widespread, thereby impeding the ability of the region to attain the related SDGs (Ohwo, 2019)

When considering the progression in global WASH from 2000 to 2017, rapid improvement had been recorded. The global urban coverage of basic water services increased from 95% to 97%, while that of the rural areas increased from 69% to 81%. The global rate of open defecation dropped from 21% to 9%, shifting from 1.3 billion people to 673 million people (UNICEF&WHO, 2019). However, the WASH situation in the world's largest black nation, Nigeria, seems to be peculiar. A recent report by

the World Bank revealed that the country is significantly lagging in the WASH sector, and recommended proactive measures should be taken to ensure rural areas have access to basic WASH facilities (World Bank (2019))

Description of the study area

Benue State falls within longitude $7^{\circ} 47^1$, $10^{\circ} 0^E$ and latitude $6^{\circ} 25^1$, $8^{\circ} 8^1 N$, the state shares boundaries with five states, they are Nasarawa to the North, Taraba to the East, Cross river to the South, Enugu to the South-west, Kogi to the West while it shares international boundary with the Republic of Cameroon to the South-east.

Odugbo is in Apa local government area was first created on 23 March 1981, with coordinates of **Latitude:** $7.64508^{\circ} N$ (or $7^{\circ} 38' 42'' N$) and **Longitude:** $8.01165^{\circ} E$ (or $8^{\circ} 0' 42'' E$ with elevation of: About 119 meters (390 feet) above sea level

as shown fig. Ai and Aii below. The local government is located in the northwestern part of Makurdi, the capital of Benue State. It is bounded to the North by Agatu local government, to the East by Gwer West, to the South by Otukpo and to West by Omala local government area of Kogi State. Some of the villages that surround Odugbo are Ebugodo, Oba, Obinda, Opaha, Ikobi, Olekle Angwa and Ikampo

It has population of about 1,000 people with a population density of about and a few Igalas and other settlers.



Fig Ai: Map of Nigeria showing Benue State

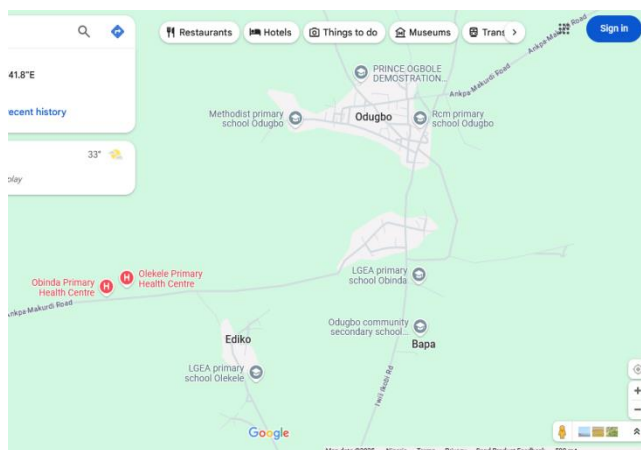


Fig Aii: Map of Odugbo town showing some neighbouring villages

Study Design and Sampling

Procedure

The study was cross-sectional in design. The study population consisted of members of the people that resides in Odugbo and the neighbouring villages like Obinda, Opaha, Edikwu and Olekle. Purposive sampling was used to select a household member from each of the household presents. A total of 40 respondents each were selected from the five villages mentioned.

Inclusion Criteria

1. The respondents selected were not less than 15 years
2. The respondent must be a member of a household in the community
3. The respondents must have lived in the community for at least 1 year

Exclusion Criteria

1. Respondents less than 18 years, whose parents did not permit to participate were excluded.
2. Community members that were not permanent residents in the village were exempted.

Data Collection Procedure

An instrument for data collection

1. Observational Checklist: This was used to assess the status of WASH facilities available to the households in the community.
2. Interviewer administered questionnaire: This was used to collect data about the management of the WASH services accessible to the villagers. Two household member was selected from each home and 20 household was used per a village. The questionnaire was divided into four sections:
 - A. Socio-demographic Characteristics
 - B. Household Water Supply Management
 - C. Household Sanitation Management

Data Collection

Questionnaire was administered to 40 respondent per community members in five communities, each from a different household within the village. The researcher assistants or fellow villagers did not coerce the respondents into filling the questionnaire. The researcher assistants ensured the entire questionnaire was adequately and correctly filled. The observational checklist was also used to assess the status of the WASH facilities available to the villagers.

Data management and Analysis

There was a 90% response rate. The data were properly cleaned for inconsistencies, then entered into SPSS version 20. The files were safely kept ensuring the confidentiality of data. Only descriptive statistics were used for analysis since total sampling was used, and only little variations existed between the responses. Descriptive statistics were used to determine the measures of frequencies and proportions of WASH facilities, while graphs and charts were used to reveal the different types of services provided by the facilities. The WASH facilities available were classified based on the JMP ladders into safely managed basic, limited, and no service.

Results.

Age

The of the respondents ranges between 15 years to 35 years, 36 years to 55 years, and 56 years to 75 years respectively.

Gender

The sex of respondent was a critical factor in the gathering of the information because some female adults were group that are much concerned about water and the cleaning

and sanitation in the house. About 70.2% of the respondents that provide water for the household were female while 29.8% were male as shown in fig. 1 below.

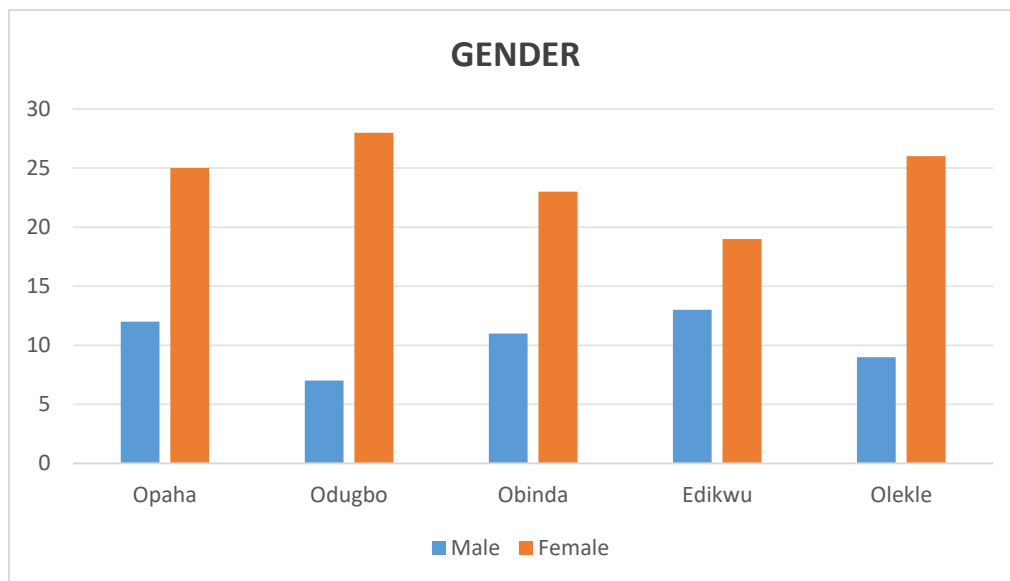


Fig. 1 : **Gender**

Sources: Researcher field's survey

Which Age Group That Fetch Water for the House

From the study it shows that 54.8% of children under 18 years were involved in the fetching of water in a house while 18-22 years record 28.4%, those under the age of 12 has 14.2% with those of over 22 years of age recorded 3.5% this is shown in fig. 2 below.

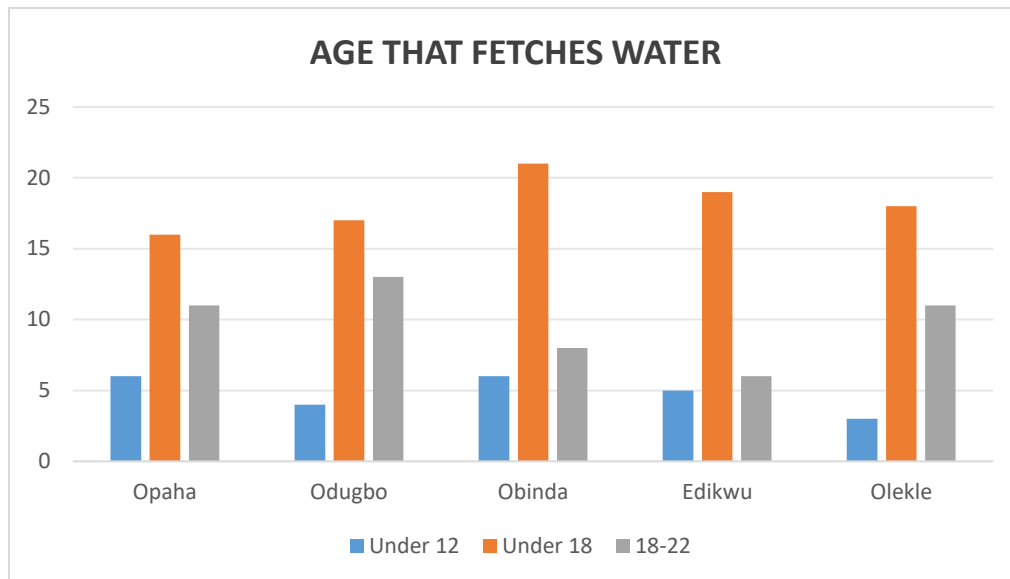


Fig.2 : Age that Fetches Water

Sources: Researcher field's survey

Distance of Water From the House

The distance of water to the houses of the respondents as presented in fig. 3 below reveals from the survey carried out that 42.8% has water within their compound, 36.3% of the respondents has water very close to their house while 20.8% say water is very far to their residence.

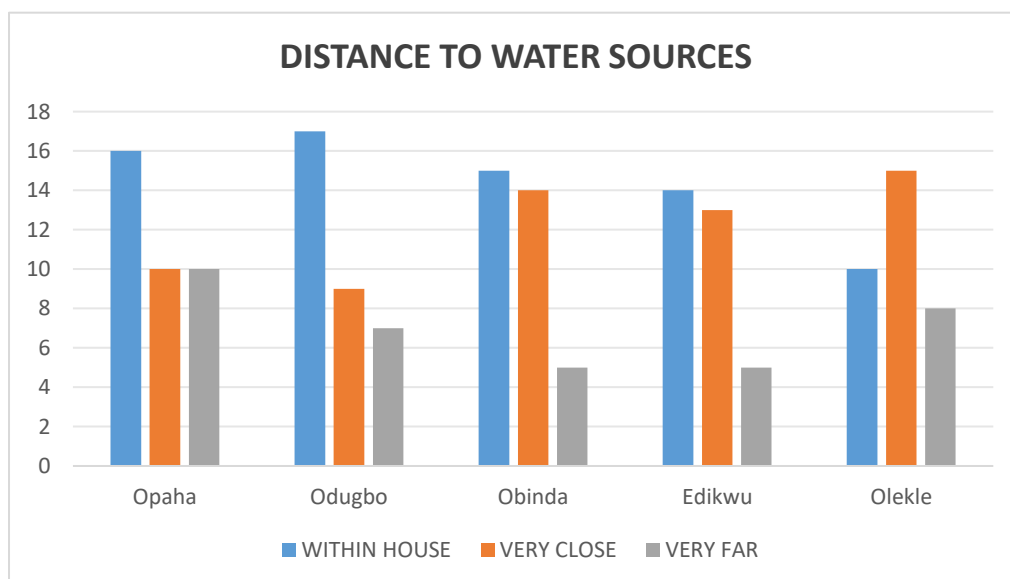


Fig 3 : Distance to Sources of Water

Sources: Researcher field's survey

Types of Drinking Water

The types of water available for drinking in the study area are well water, river water, rain water and packaged water (sachet water) in stores. About 51.76% has well water as their type of water while 20% has rain water as their type of water . 14.2% of the respondents uses river water and 13.5% drink packaged water as shown in fig. 4 below.

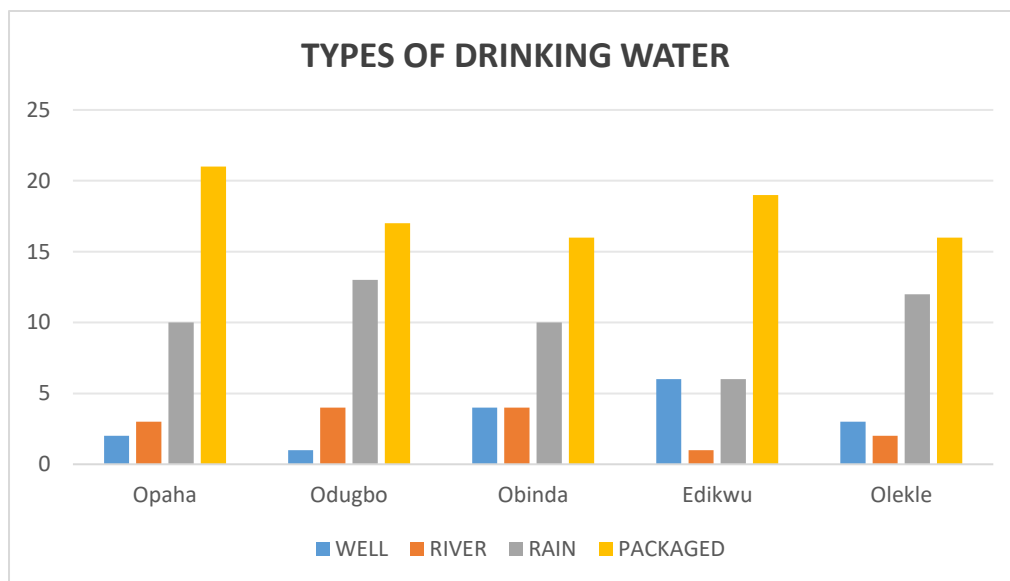


Fig 4: Types of drinking water

Sources: Researcher field's survey

Rating of the Water Quality

In the assessment of the water quality by the respondents the result shows that the 52.4% of the respondents says that packaged water is the best water for drinking, 30% says rain water is the best, while 9.4% believe n well water, 8.2% prefer river water as the best quality, this preference is shown in fig. 5 below.

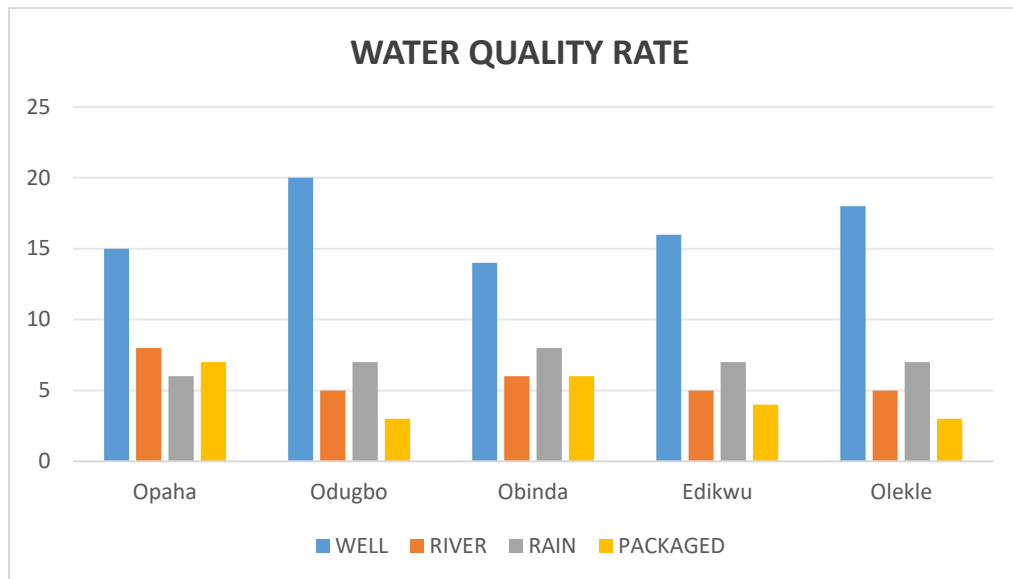


Fig: 5 Water Quality Rate

Sources: Researcher field's survey

Safety of Water

In fig. 6 below the respondent gives their verdict in terms of the safety of the types of water they drink in the study area as shown in fig.6 below. About 47.3% of the respondents feel that water they drink is safe, 32.3% says it's not safe while 20.4% were not decided.

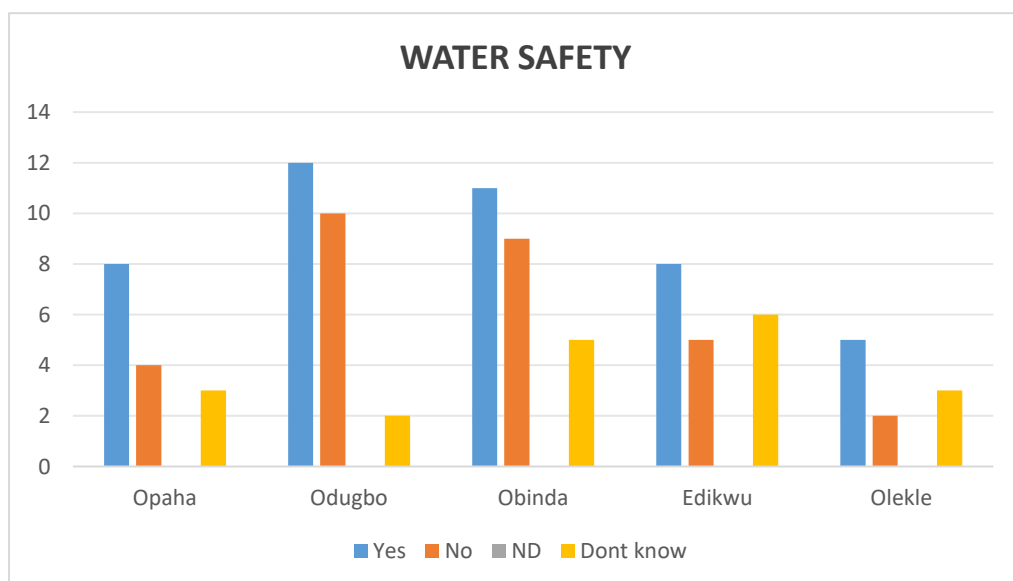


Fig.: 6 Water Safety

Sources: Researcher field's survey

Satisfaction with Water Quality

In fig. 7 below the respondents shows level of their satisfaction with the drinking water available to them in the study area, though 41.1 % of respondents says there are not satisfied, 25% were okay with it while 33.9% said there is need for improvement of the quality.

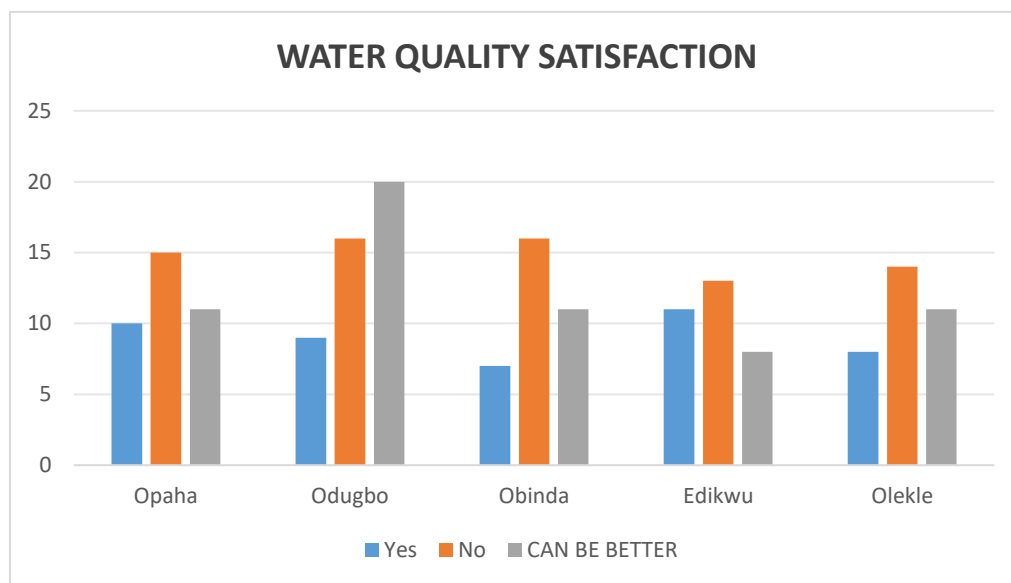


Fig. 7: Water Quality Satisfaction

Sources: Researcher field's survey

Treatment given to Water before Drinking

Since the quality and safety of water in the study area is not guaranteed there is every need to give some sort of treatment before drinking or usage. On this the result obtained in fig. 8 shows that 33.5% all the water to settle before drinking, 29.4% add chlorine or water guard, 25.3% drink the water without doing anything to it while 11.8% filter the water. Boiling which is the simplest and sure possible ways of eliminating microbes was not practiced by any of the respondents.

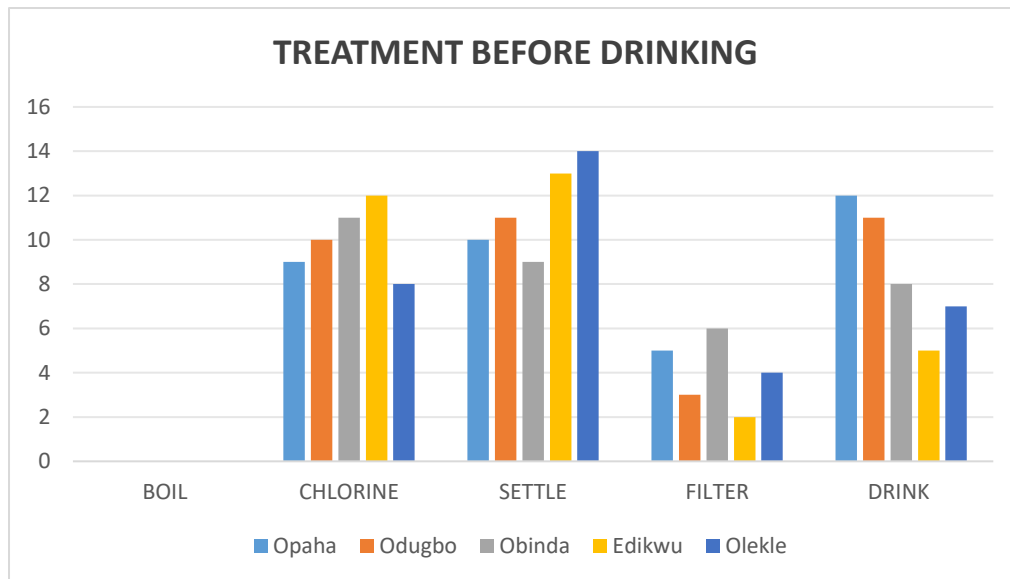


Fig. 8: Treatment Before Drinking Sources: Researcher field's survey

Cost of Water

Water as an essential commodity for man's life, it's availability is very crucial hence the cost of obtaining is important. In the light of this the respondent were asked on what is the cost of getting water for use. About 52.9% of the respondent buy water, 23.5% depends of buying water while 21.1% buy sometimes but not always as shown in fig. 9 below.

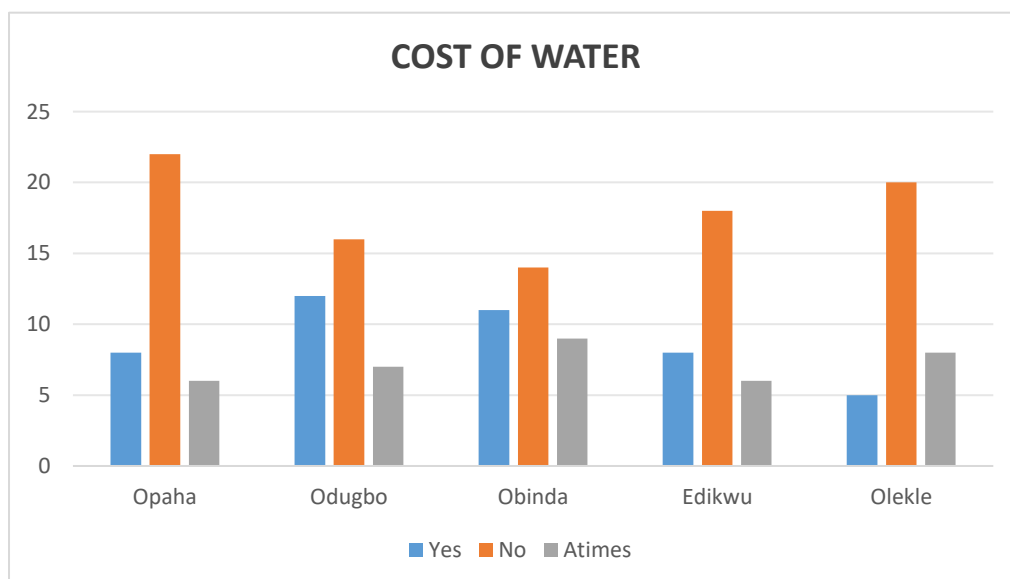


Fig. 9: Cost of Water

Sources: Researcher field's survey

Toilet Facilities

Water contamination is a paramount factors in water supply and the health of the people so the toilet facilities is key in any society because of possible health risk in its disposal vis-a-vis availability of water. The types of toilet, water and its handling has a far reaching effects on water sanitation and hygiene (WASH) of the area and people. From the data obtained in this study as shown in fig. 10 below, 46.8% of the respondents uses the bush for defaecation, 23.4% uses flushing types of toilet, 8.2% uses septic type while 21.5% uses pit toilets.

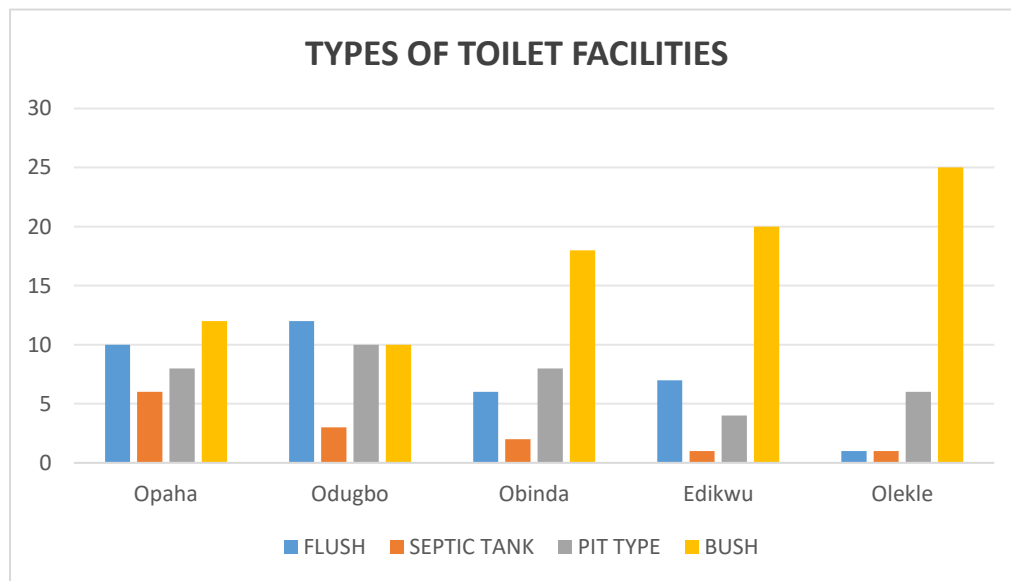


Fig. 10: Types of Toilet Facilities

Sources: Researcher field's survey

Disposal of Children Faeces

Waste disposal is a serious source of pollution and contamination of our environment hence the need of the evaluation of how faeces of the young and infants are disposed based on the toilets facilities discussed. Fig. 11 below shows that 28.3% of the respondents disposed their children faeces into garbage, 13.2% of the mothers says their wards uses the toilets, 8.5% throw it into the toilets, 25.5% throw it to the bush while 26.4% uses other ways that was no disclosed.

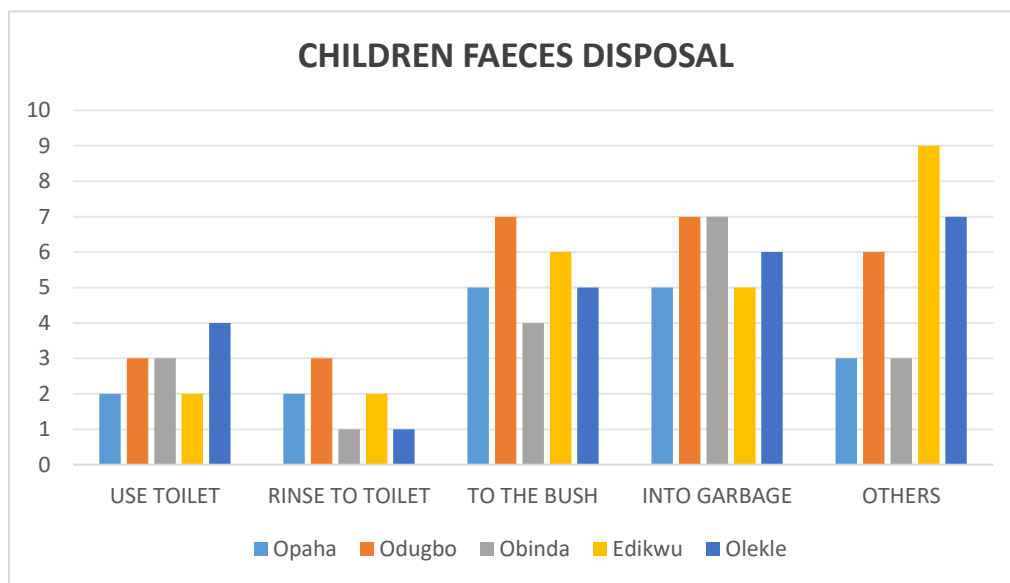


Fig. 11: Children Faeces Disposal Sources: Researcher field's survey

Contracting Waterborne Diseases

The question of having ever suffered by respondents has the following results, 90% agreed that they have suffered from various waterborne diseases in the time past while 6.0% did not want to disclose and 3.6% says they have never encountered any of such ailment before as shown in fig. 12 below.

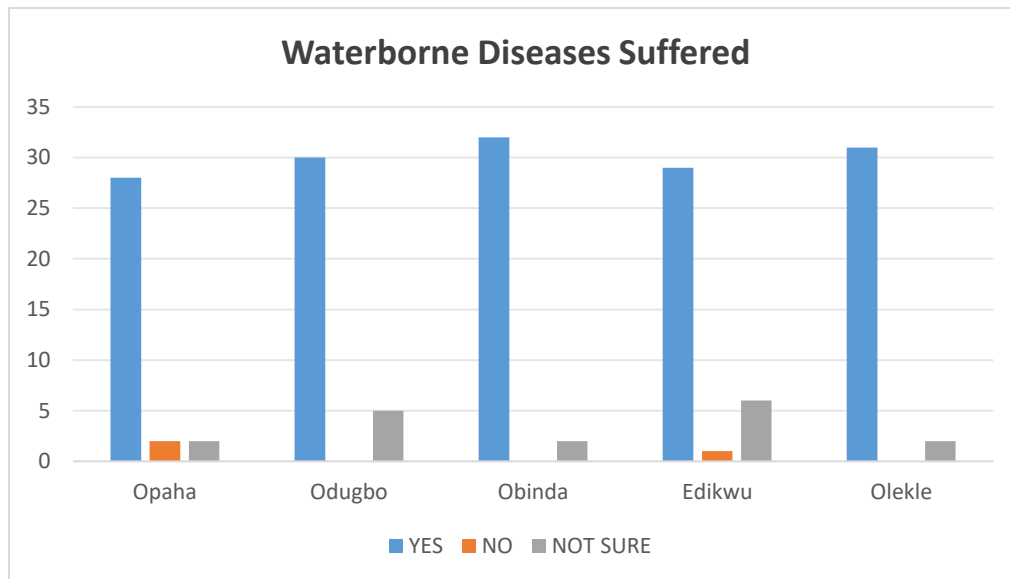


Fig. 12: Waterborne Diseases Suffered Sources: Researcher field's survey

Type of Waterborne Diseases Encountered

The data obtained from the respondents on what types of waterborne diseases they have encountered in the past one year as shown in fig. 13 below shows that 26.4% had Typhoid fever, 18.3% had Diarrhoea, 16.9% had Dysentery, 14.5% had Cholera while 23.9% had malaria fever.

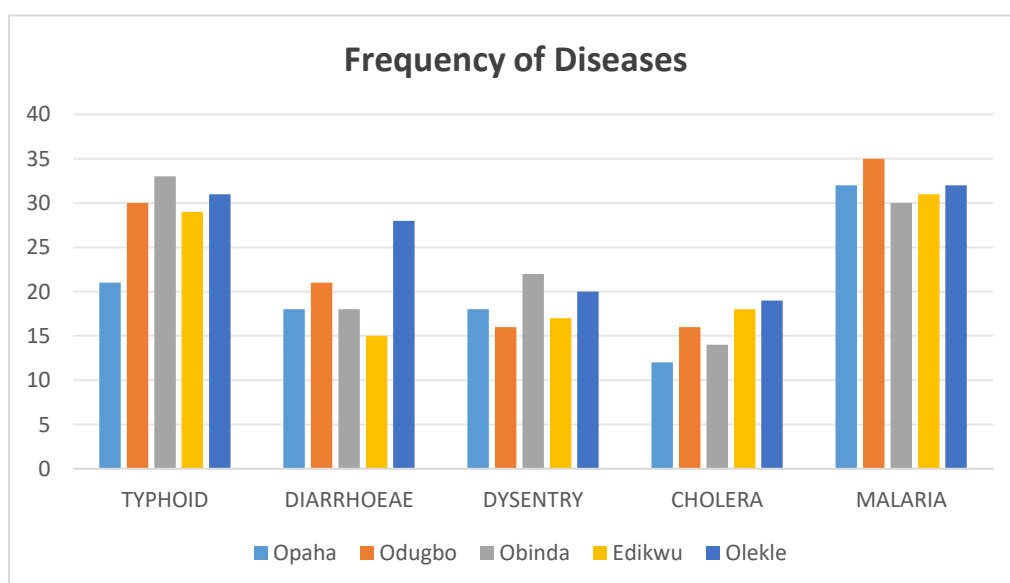


Fig. 13: Frequency of Diseases

Sources: Researcher field's survey

Discussion

Rural areas settings are typically known for lack basic infrastructures like good road networks, quality water supply, basic healthcare facilities, and power supply (Wada et al., 2020; Afolalu et al., 2020). Based on this the assessment of household water quality, sanitation, and hygiene management This makes it important for future rural interventions in other communities to build locally sustainable facilities.

From the result of the study some houses were nearer to water sources in the village while some have considerable distance to cover before getting water. Due to the nature and the types of water sources in the study area, scarcity of water is a common syndrome in the dry seasons and the supply of packaged water to the area is difficult in the rainy season because of the terrain of the road. This finding agrees with the review paper by Ishaku reported that 70% of rural households in Nigeria were without access to improved water supply and that this faction depended on unimproved sources like streams and water ponds (WHO & UNICEF, 2019).

The problem of water scarcity is aggravated in the study area because there is no functional borehole (either motorized or hand pump operated) type in any of the villages which makes them not to have any other options than to be compelled to return to their old polluted sources. Improved rural water supply through borehole systems is saddled with problems of sustainability in Benue State. According to Ocheri (2010) more than 50% of the boreholes are not functioning or have broken down and left Un rehabilitated or completely abandoned. Beside, water of doubtful quality due to present of colour, odour, taste and presence of E-coli which are indications of pollution are undermining the well intended efforts. Drinking such water makes the rural populace prone to waterborne diseases as shown in the result

presented. In 2020, 74 per cent of the global population used safely managed drinking water services. National estimates were available for 138 countries and four out of eight SDG regions, representing 45 per cent of the global population. Coverage was lower in rural areas (60 per cent) than in urban areas (86 per cent), which were home to two out of three of the 5.8 billion people using safely managed services. By 2020 a total of 84 countries had achieved universal (>99 per cent) coverage of at least basic drinking water services. However, in recent times notable progress has been made in increasing the accessibility of rural areas in Sub-Saharan Africa to WASH facilities. Globally, significant progress has been made in expanding access to clean water, with over 90% of the world's population now enjoying improved water sources (WHO & UNICEF, 2019). However, approximately 785 million people still lack basic water services, and disparities persist between urban and rural areas and among different socioeconomic groups (WHO & UNICEF, 2019).

The available toilet facilities in the study area are pit toilet, flush and septic types, pit latrine which should be the most affordable is 21.5%, flush types 23.4% while septic has 8.2% but those that uses the bush are 46.8% which is in line survey conducted in oil-producing communities in Bayelsa State reported that 45% of the dwellers used pour-flush toilets, 4% used VIP latrines, while 52% practiced forms of open defecation (Olalekan et al., 2018).

Moreover, the non availability of improved sources of water supply, improved sanitation at home, and routine sanitation and hygiene talks by the sanitary inspector are factors that makes makes healthy sanitation and hygiene practices at home difficult. These make most of the respondents still practised open defecation because there were no toilets.

It evident that the availability of improved sources of water supply, improved sanitation at home, and routine sanitation and hygiene talks by the sanitary inspector are factors that encouraged healthy sanitation and hygiene practices at home but because these facilities are hard to come by the people have no choice than to indulge in open defaecation with its attendant consequences on the people.

The issues of lack of quality potable water, improved sanitation and that exacerbate healthy sanitation and hygiene practices at home could be the major causes of waterborne diseases recorded in the study area as shown in the result of the study as presented.

Conclusion and Recommendation

The survey carried out in Odugbo and the surrounding villages has shown that there is water quality and sanitation issues which will cause a serious problem in the town.

The quality of the water available in the study area is sub standard and also not readily available, the immigrant to the town are having it difficult in terms of accessibility of water. Also the available toilet facilities in the study area is inadequate with practice of open defaecation and open disposal of faeces of minors which put the populace to the danger of environmental pollution vis-a-vis pollution of the rivers and run-offs that can seep into well water. This circumstances can lead to aggravating waterborne diseases in the area which was evident in the result presented. The water related diseases such as typhoid fever, dysentery, cholera, diarrhoea and malaria fever from the respondents is reflection of the problems of water scarcity faced by the inhabitants living in the study areas. These people search for drinking water from all sorts of unprotected water sources. Consequently, they are exposed to all kinds of risks linked with drinking of polluted or unsafe water. Public education on personal hygiene, safe

drinking water, and intervention by governments and non-governmental organization will go along to remedying the situation.

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