Evaluation of Water Security in Ihovbor Community of Edo State, Nigeria.

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Abstract- ***Water is indispensable to life, but many people do not have access to clean and safe drinking water leading to many waterborne bacterial infections. Potable water accessibility has become a major challenge in the Ihovbor community, of Uhunmwonde Local Government Area of Edo state. The United Nations Sustainable Development Goals (SDGs) Goal 5 in 2015, adopted and recommended access to reliable and sustainable water for all. This development re-emphasized the importance of potable water in the lives of humans. Remarkably, access to safe drinking water and proper sanitation facilities is a requirement for healthy living and success in the fight against hunger and poverty in rural communities. The Edo State Government and the entire Ihovbor community must work together in achieving the United Nations Sustainable Development Goal (SDG) Goal.5 for the communities. This vision of the United Nations can be achieved by strengthening the capacities of relevant agencies in the state Ministry of Water Resources to be more proactive in monitoring and ensuring effective compliance with water management policies. The study examined the conceptual classification of water resources in listed communities and it accessibility to the common citizen.***

Indexed Terms- ***Sustainable water, Hunger, Potable Water, indispensable, United Nations Sustainable Development Goal, (SDG), Sanitation.***

I. INTRODUCTION

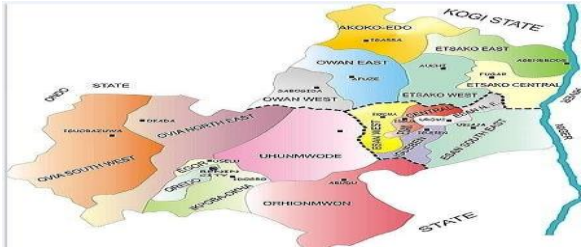
Water is a necessity for good living; it is also the most important resource of a society. Without water no life will exist, hence every society needs sufficient clean water for healthy living. A community can survive without other resources like minerals, fuels, forests, livestock, etc. but cannot survive without water [1]. As long as sufficient water remains accessible to fulfil the present and future needs of the communities, conflict does not arise among the populace; but if the available water becomes scarce or undersupplied, then quarrels and conflicts among its shareholders are bound to arise. [2]. The national requirement for water varies with the level of economic development of any community. According to Gleick (2001), an individual requires about 50 litres of water per day as a minimum for the four basic needs (drinking, sanitation, bathing, and cooking) [3]. Sources that are likely to provide water suitable for drinking and utilities are identified as improved sources and inadequate access to water may limit the quantity of suitable drinking water that is available to a household, even if the water is obtained from an improved source.[4] Hence, the amount of water used in the Ihovbor communities does not depend only on minimum needs and availability, but mostly on the level of economic development within the community. The water challenge in rural communities in Nigeria needs to be addressed urgently. Despite accounting for 46% of the nation's population, 39% of rural households lack access to at least a basic water supply. These present a serious concern, particularly about the feasibility of achieving Sustainable Development Goal 6 by 2023.

The UN Millennium Project Task Force on Water Supply and Sanitation, acceptable quality water is required with basic sanitation principles which means having latrines nearby with soap or that people practice safe hygiene [4]. According to the 2018 National Demographic and Health Survey, access to safe drinking water is still low in the rural communities of Nigeria at 58%, this is expected to be worse in some parts of the country where the use of projected toilets is encouraged irrespective of the poor quality of groundwater and high concentration of iron, manganese and arsenic [5]. The Ihovbor town is notable for the existence of the two major Integrated Power Plants (IPP) in Edo State namely; the Benin Generation Company owned by the Federal, State and

Local Governments in Nigeria and the Azura-Edo Independent Power Plant owned by a conglomerate in the power industry. The presence of these power plants in Ihovbor should have attracted important modern infrastructural amenities, but that was never the case in Ihovbor as the community barely had clean water to maintain good and healthy living. Hence the deliberate, intentional and arbitrary denial of essential amenities to the people of Ihovbor can also be a violation and its supply will enhance the economic growth and development of the community.

II. MATERIALS AND METHOD

The study was carried out using a descriptive cross-sectional study design, with the data collected using a structured interviewer-administered questionnaire, field observations and focus group discussions. The questionnaire was administered to both male and female members of the communities to collect information on the main source of drinking water, the time it takes for the round trip to the main water sources, and methods used for the treatment of water of uncertain quality. An inventory of all the community water facilities was also taken, and information was collected on the functionality of the facilities, and how they were constructed, operated and maintained. A sample of the water from each source was collected in a sterile container for microbiological analysis.



Fiq 1. Map of Edo State (Showing the Local Government Areas)

A triangulation of the qualitative research techniques was used to help achieve a deeper insight into the context of the water situation in the Ihovbor town. According to the United Nations World Population Prospects, the number of people in Edo State is estimated to be 4,897,700 [4]. The town under study is estimated to have 10,000 inhabitants, while the entire Local Government Area is about 170,780 people (projected in 2022). To determine the sample size, an online calculator was used with a 5% margin error and 95% confidence level to arrive at 370 people. However, due to time limitations, the study was able to reach out to 360 participants using 58% as the average of access to clean water in rural communities of Nigeria. [5]

The data were collected by the author and analyzed for the type, operation, maintenance and functionality of water facilities, and the microbiological status of the water, using the membrane filtration technique. The data were analyzed according to the standard method and the results were considered to be significantly contaminated if they were found to be beyond the World Health Organization (WHO) minimum acceptable values [6].

III. RESULTS

A total of 400 questionnaires were administered and retrieved. The respondents had an average age of 29 years; most (77.50 %) had a secondary school education or less and had spouses who were mostly engaged in small-scale businesses (18.75%) (Table I). Table 2 shows the water and sanitation facilities of the respondents. The most common source of drinking water protected hand –dug well (44%), with surface water serving the needs of up to 2.5% of the households.

Table 1: The socio-demographic characteristics of the study.

Participants

Variables (Age)	N0. (400)	Percentage
10 – 19 years	34	8.5
20 - 29 years	100	25
30 - 39 years	130	32.50
40 - 49 years	80	20
50 – 59 years	56	14
Educational Status of Respondent		
No formal education	40	10
Primary	75	18.75
Secondary	195	48.75
Tertiary	90	22.50

Occupation of respondent's spouse		
Small Scale Businesses(Buying & Selling)	75	18.75
Self-employed	89	22.25
Civil servant	38	9.50
Employed in the private sector	58	14.50
Student	60	15.00
Unemployed	80	20.00

Table 2: Household water and sanitation facilities

Variable (Sources Of Drinking Water)	N0 (400)	Percentage
Public tap supply	75	18.75
Piped household supply	38	9.5
Borehole water	54	13.5
Protected hand-dug well	176	44
Surface water	10	2.5
Bottle/ sachet water	47	11.75
Household Treatment Of Water Before Drinking:		
No treatment	248	62.0
Boiling	79	19.75
Cloth Filtration	45	11.25
Chemical treatment/ Alum	28	7.0
Storage Sources Of Drinking Water.		
Piped supply	60	15
Jerry can	168	42
Drums & Cover Basins	135	33.75
Earthen Pot	37	9.25
Toilet Facilities used by the household		
Flushed toilets with septic tanks	115	28.75
Pit latrine	198	49.50
Bush toilets	25	6.25
Public toilet	48	12.00
Jetty toilet	14	3.50

About (62%) of the drinking water used by the households was not treated, even though only 49.50% of the people in the Ihovbor community use the pit latrine, exposing them to health infections. The number and type of water supply facilities in the study community are shown in Table 3. There were a total of 54 water supply facilities in the communities, but only (61%) were functional as at the time of this research.

Table 3: The number and types of water supply facilities in the study community.

Facilities	Functional	Non-Functional	Total.
Community water tank	1	1	2
Protected hand–dug well	24	13	37
Hand pumped well	1	2	3
Surface water	7	5	12
Total	33	21	54

Table 4 below shows the results of the microbiological analysis of the water sample collected from various water sources in the Ihovbor community.

Facility	Number tested	Number Positive
Community overhead water tank	17	8
Protected hand–dug well	12	10
Hand pumped well	8	2
Surface water	15	15
Total	52	35

About (67.3%) of the tested samples were found to have substantial numbers of Escherichia coli; especially those collected from surface water.

DISCUSSION

The study showed that the Ihovbor community has only one functional overhead community water tank and most of the inhabitants members provided themselves with different water supply facilities. According to the Water, Sanitation, Hygiene National Outcome Routine Mapping, 2021 (WASH) only 10% of Nigeria's population has access to all essential WASH services, and the situation is even worse in remote and hard-to-reach communities such as the Ihovbor community [7]. Access to safe, clean drinking water depends on whether the community water system functions adequately in Ihovbor community. However, as much as 38.8% of the Ihovbor water sources were not functional as at the time of the study (Table III). This has also been noted and blamed on the absence proper maintenance of the facilities.

The non-functional water facilities makes a large percentage of the inhabitants to get drinking water from non-improved sources. This is worse than the national average for rural areas of 53.4% and very unhealthy considering that as high as 67.9% of the water facilities were found to have e.coli count higher than the WHO recommended level [8]. The quality of water in the community can be improved by ensuring the functionality of the water facilities and adopting regular purification system. The use of frequent water purification systems would fully sustain the huge water resources in Ihobor community and discourages the use of the expensive bottle/sachet water that was used by11.75% of the households to satisfy their drinking water needs. Point-of use water purification systems have been found to deliver as much health benefits as an improved water source [9], Promoting frequent purification systems require a deliberate effort, especially because 62% of the households did not see the need to purify water of suspicious quality before drinking; while up to 18.25% uses chemical and cloth filtration that are not particularly effective in disinfecting the water in the communities. The applicable technology for the purification of ground water is probably lacking, leading to the high level of non-functionality of the water facilities.

CONCLUSION

The Ihovbor community had easy access to water supply, but most of the facilities were either contaminated or nonfunctional. The operation and management of the facilities by members of the communities, and the promotion of frequent and point-of-use purification systems are hereby advocated.

REFERENCES

[1] Yamaguchi Ayami., et al. "Two Novel Heat-Soluble Protein Families Abundantly Expressed in an Anhydrobiotic Tardigrade". PLoS ONE 7.8 (2012): e44209.

[2] Raimi Morufu Olalekan., et al. "An Analysis Of Bayelsa State Water Challenges On The Rise And Its Possible Solutions". Acta Scientific Agriculture (2019): 110-125.

[3] Gleick, P. H. (2001), The Changing Water Paradigm: A Look at Twenty-First Century Water Resources Development, Water International, 25(1):127-138.

[4] World Population Prospects - Population Division - United Nations. Population.un.org. 2022. https://population.un.org/wpp/.

[5] National Population Commission (Nigeria) and DHS *Nigeria Demographic and Health Survey 2018*. Rockville, Maryland. 2019: 20 – 22.

[6] WHO, United Nations Children's Fund (UNICEF), and Water Supply and Sanitation Council.

[7] Global Water Supply and Sanitation Assessment 2000: Report. New York: UNICEF. 2000.

[8] Water Sanitation and Hygiene National Outcome Routine Mapping, 2021.

[9] World Health Organization. Guidelines for drinking-water quality. 3rd ed. Geneva. World Heath Organization. 2006: 62 – 83

[10] Clasen T, Roberts I, Rabie T, Schmidt W, Cairncross S. Interventions to improve water quality for preventing diarrhoea. Cochrane Database Syst Rev 2006; 3: CD004794