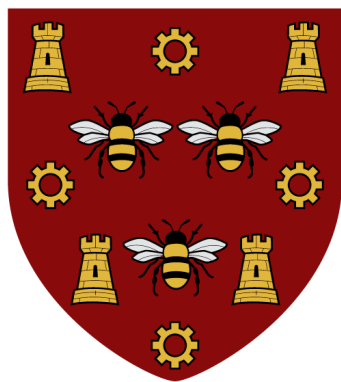




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Investigating challenges and opportunities to achieve SDG 6: a study of Benin City, Nigeria

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Abstract

Access to clean water and adequate sanitation improve sound health, enhance socio cultural development, and promote economic balance. This study focuses on investigating the challenges and opportunities to achieve Sustainable Development Goal (SDG) 6 by 2030: a case study in Benin City, Nigeria. Three local government areas in Benin City (Egor, Ikpoba-Okha, and Oredo) were selected for this study. The survey involved the use of 150 structured questionnaires administered to the people from the local government areas (LGAs). A total of 127 responses were received and processed for analysis. The data were analyzed using Microsoft Excel and Statistical Package for Social Sciences (SPSS version 27.0) software application. Although the Federal Government has put in measures such as the National Action Plan (NAP) to ensure that the objectives of SDG 6.1 and 6.2 are achieved, the findings of the study however have shown that there are still problems of accessibility, acceptability, availability, affordability, and quality. Seventy-eight percent of the respondents indicated to spend over 2,000 naira monthly on water while 86% indicated to pay extra charges to acquire water. 48.8% residents have to cover a long distance of 3 km in order to get water. 61.4% found water not to be safe for drinking while 84.3% indicated that the quality of water and sanitation in public places are of bad quality. 63.8% indicated to have challenges to availability of water and sanitation. A large percent of the residents indicated to have felt discriminated regarding water and sanitation because of their socio level. However, the study found lack of water and sanitation to be gender neutral, as both men and women are affected.

Keywords: *challenges, clean water, facilities, opportunities and sanitation*

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1. Introduction

The access to safe water, sanitation, and good hygiene is one of the most basic necessities of human beings that contributes to their health and wellbeing. According to UNICEF, having access to clean water, basic sanitation, and the practice of good hygiene is vital for survival and growth of children [1]. A recent report from the United Nations (UN) reported that, unless measures are taken in quadruples, by 2030, billions of individuals around the world will have no accessibility to such needs (clean water and proper sanitation) [2]. In addition to the swift urbanization and increase in population, the requirement for water has increased for use in various areas such as industries, agriculture, and energy sectors.

The problem of water stress has been worsened over the years as a result of poor management, misuse, contamination of freshwater supplies, and over extraction of ground water. Moreover, the problem is compounded in developing countries resulting from degraded ecosystems that are influenced by water, low investments in water, and sanitation problems by governments, as well as water shortages brought on by changes in the climate [1].

Nigeria has made only modest progress in expanding access to water, sanitation, and hygiene (WASH) to its rapidly growing population of 183 million people. According to Global Water report, only approximately 48% of people in Nigeria is able to acquire basic water for drinking, 33% having access to sanitation facilities [3], whereas open defecation is practiced by 23.5% of people [4]. The problem is said to be severe in the northern parts of Nigeria where reports have indicated that only 30% of the population enjoy safe drinking water and good sanitation [5]. This results in widespread presence of water-borne diseases such as diarrhea, disrupting the livelihood of small farmers and affecting school enrollment of children, especially the girl child [4, 5]. Data according to the UNICEF report have shown that more than 70,000 of children below five years of age die per year due to diarrhea, one of the main illnesses linked to inadequate access to clean WASH, which mostly affects poor children. It is based on this premise that the UN set this goal to universally ensure access of water to all by 2030. This according to the UN would help save 829,000 persons who die each year from diseases caused by inadequate sanitation, poor hygiene, and lack of access to clean water [6].

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As a global strategy to ensure a sustainable society for all people, the Sustainable Development Goals (SDGs) were introduced by the UN in 2015 as the 2030 Agenda. The SDGs are a group of seventeen (17) interrelated goals that deal with several elements of sustainable development, such as eradicating poverty, environmental conservation, and availability of basic amenities including water and sanitation. By 2030, Goal 6 of the SDGs intends to offer everyone with access to sustainable water and sanitation management [7]. SDG 6 seeks to guarantee that everyone in society has equal access to sustainable water and sanitation. Essentially, everyone is entitled to safe water that is adequate in terms of quantity as well as quality. The SDG 6 strongly emphasizes the need to minimize water waste and maximize water usage from domestic to industrial levels [8].

Is Nigeria on track of achieving the Sustainable Development Goal 6? These are some of the numerous questions being asked which seeks answers to the problems faced by the country. Notwithstanding the efforts being made by the government and other development partners, getting access to water and sanitation still requires a lot of work to a larger number of the population. While there has been some improvement in the accessibility of water in the places, data have shown a reduction in the number of urban home owners who have access to piped water in their home; this figure has dropped from 32% in 1990 to 3% in 2015. However, during the same period, urban regions have increased from 30% in 1990 to 48% in 2015 [8], and this tendency is expected to continue in the coming years. Access to water can be difficult for a variety of reasons, including rapid urbanization, inefficient and ineffective service delivery, increase in demand for services, institutional and government constraints among others.

Nigeria is one of the countries in Sub-Saharan Africa (SSA) with one of the worst records for providing its population with widespread access to water supplies and sanitary services [9]. The lack of access to clean water in Nigeria has severe ramifications for individual finances and personal cleanliness, endangering the health of almost 40 million Nigerians [10, 11]. Urban areas in Nigeria are burdened by the unyielding growth of squatter settlements, densely populated housing, malfunctioning rubbish collection systems, pollution of the air and water, together with poor sanitation and access to water facilities [9].

Available data showed that, given the lack of access to clean water and sanitary facilities in remote locations, Nigeria will need to increase its funds by an estimated eight million each year in order to achieve SDG 6's goals by 2030 [12]. The problem has attracted the attention of the populace in both rural and urban communities in Nigeria with regard to water supply and sanitation services. In line with the above discussion, this research attempts to close this knowledge gap with the view of investigating challenges and opportunity to guarantee access to a reliable supply of clean water and sanitary services for Nigerians, by 2030 with reference to Benin City in Nigeria as a case study.

Nigerians have become more concerned about water contamination because it produces unfavorable environmental conditions that endanger public health. A study carried out in Benin City's University of Benin Teaching Hospital's Community Health Division to find out how water pollution affects residents of Benin City discovered that individuals had water-borne illnesses because of water contamination [13].

According to another report, the Ekosodin community in Benin City has limited access to sufficient WASH facilities and services, particularly those that deal with water treatment, toilets, and waste management. Households were found to have poor hand-washing habits, poor water storage container upkeep, and inconsistent hand-washing schedules [14]. Using the National Sanitation Foundation Water Quality Index (NSFWQI) procedure, a study conducted by Michael and Macduff [15] in some locations in Benin City showed that the grade of ground-water was not suitable for human consumption.

2. Materials and methods

2.1. Theoretical framework

2.1.1. Human right base approach

This study adopts the Human Rights Based Approach (HRBA) as its theoretical framework. The HRBA has been used in a number of areas in addressing international development issues such as health, poverty reduction, education, and welfare of people [16]. The HRBA "is a conceptual framework for the process of human development that is normatively based on international human rights" [17]. It aims to examine inequalities at the heart of development issues and to address discriminatory practices and unequal power distribution that obstruct development progress and frequently result in groups of people falling behind.

According to the HRBA, having access to safe drinking water and proper sanitation is a fundamental human right [18]. According to this strategy, these services should be provided in a fair and inclusive manner so that disadvantaged and marginalized communities are not left behind [19]. In addition to ensuring that practices and policies are based on the fundamentals of human rights, such as non-discrimination, participation, and accountability, this approach aims to strengthen communities by giving them more power.

For the HRBA to work effectively, Human Rights to Water and Sanitation (HRWS) [19] proposed five cross-cutting principles to work in harmony with HRBA. These principles are availability, accessibility, affordability, quality, and acceptance. The HRBA cross-cutting principles are used in conjunction with the normative criteria of the HRWS to support the realization of the HRWS, strengthen the capacities of both right holders and duty-bearers, and produce sustainable results. This all-encompassing approach is crucial in terms of water and sanitation because many projects tend to focus on quantity (availability) as well as quality instead of addressing all HRWS-related factors, such as accessibility (especially for the less able), acceptability (critical to maintaining the safety and dignity of women and girls), and affordability (ensuring that any pricing enables all people, especially the most vulnerable).

By accessibility, HRWS asserts that there should be no threat to human safety as well as universal access to clean water and sanitary facilities. A key consideration in this situation is physical accessibility. Even though there are no clear international legal guidelines for physical accessibility to water, the World Health Organization (WHO) has fundamentally made this a necessity [11]. They concluded that the round-trip water collecting journey should not take more than 30 minutes to reach the water source and it must be a thousand meters or less from the residence, place of employment, or both.

On availability, HRW suggested that water should be made available to all and in the right places. For personal and home applications, such as drinking, food preparation, personal cleanliness, and household maintenance, water must be readily available in sufficient quantities and continuously. There should not be a preference for industrial and agricultural water consumption over household and personal use. There should be sufficient sanitation services on the grounds or close by for every family, health, educational, or other public institutions. The WHO states that the sufficient amount of water to meet health requirements is between 50 and 100 liters per person per day [20].

HRW continued that it is the responsibility of the states to ensure that the general public is able to afford water and sanitary services. Governments should take into account low-cost technology, income supplements, and suitable pricing regulations, including free supply for those who cannot pay, to ensure these services. The original recommendation of 3% of the household's earnings has since been revised to clarify that expenses for water and sanitation ought not to render it difficult for people to get other essentials such as food or healthcare. According to the special rapporteur, each state should conduct an evaluation of affordability based on specific local or national issues and circumstances [21].

In addition, the quality of water must be safe for ingestion; thus, it must be devoid of microorganisms, chemicals, and other potential dangers, and should not harm people's health in any way. The operation of sanitation facilities must be safe, and they must successfully prevent interaction between people, animals, and insects and human excreta. It should be noted that the Joint Monitoring Programme (JMP) Ladder's definition of "Safely Managed Sanitation Facilities" encompasses both for the disposal dumping of waste and the prohibition of disposing of human feces in water bodies [22].

The importance of water and sanitation cannot be overemphasized in the lives of human beings and other living creatures. Lack of water and sanitation in developing countries has contributed to a number of diseases and has been a major threat to child health in these developing countries across the globe. Studies by the WHO suggests that diarrhea which is one of the major diseases associated with poor water and sanitation accounts for about one million deaths of children below the age of five, making it higher than a combined figure of malaria and HIV [23].

A report by the UN in 2007 indicated that more than 50% of the population in developing countries do not have access to basic sanitation amenities [24]. Notwithstanding the progress made in the sector of water, about 21% of the population in developing countries are unable to access enough drinking water [2]. According to the United Nation Development Programme (UNDP) report, the problem is largely found in the Sub-Saharan African countries which includes Nigeria, where 63% of the population do not have access to basic sanitation and 45% of the people lack safe drinking water [2].

Many works of literature have underscored the importance of water and sanitation and its negative effects on human health. It is of this notion that the SDG 6 as well as Millennium Development Goal (MDG 7c) sought to find solution to this problem with the aim of ensuring that all countries achieve a certain standard of access to water and sanitation by the year 2030. In addition, Günther and Fink [25] found that good water and sanitation infrastructure helps in reducing the number of children from

getting diarrhea from 17% to 7% and also reduces child mortality risk for children under five years by 5% from 20%. Further, Benova, Cumming, and Campbell [26] also discovered in their studies that poor sanitation is significantly related to higher maternal mortality while poor water environment is also associated with high maternal mortality.

Some studies have found the importance of water and sanitation in reducing diseases such as diarrhea in child health and its consequence in the reduction of child mortality [4, 25, 27]. Good water and sanitation have been demonstrated to improve human health and reduce health-related diseases such as trachoma, schistosomiasis, and internal Helminthes, among others. Moreover, the human immune system is said to be strengthened and able to fight against new infections as a result of good water and sanitation. Additionally, Engell and Lim [27] found that improved water and sanitation have a significant effect on reducing health-related risks.

Latest studies on public health effects of water and sanitation in selected West African countries discovered that, the MDG 7c whose aim was to ensure that by 2015 a portion of the population without sustainable access to safe drinking water and basic sanitation be reduced could not be achieved. The study showed that while enough progress has been made to improve water, sanitation saw a slow progress for the countries between the years 2000 and 2014 [28].

Owbo and Ndakara [29] found that lack of access to water and sanitation is not gender neutral, as it impacts women and children more than men. They were of the view that women and children take a lot of responsibility in collecting water to the house when it is not available. It takes a lot of their time and burdens them, as women can spend hours together walking, queuing, and carrying water to their homes. This time spent could have been invested in other productive areas at home such as childcare and other housework.

The UN General Assembly on July 28, 2010, declared water and sanitation as a human right and that it was directed at its member nations that this right be implemented through water and sanitation policies [30]. Considering the devastating effects and threats to public health, with 2.5 billion of the population not having good access to sanitation facilities and 768 million people not having good drinking water, the decision by the UN was to ensure that member governments make efforts and policies to address this menace.

Human rights proffer a normative framework by which global justice is advanced by means of public policy, defining legal responsibilities to progressively ensure that there is water and sanitation for all. As influential to human dignity, human rights seek to ensure that basic needs and entitlements of people are sustained to ensure a universal moral vision [31]. To address this moral responsibility for improved water and sanitation, the WHO in 2003 through international human rights laws identified individual right holders and their prerogatives and corresponding individuals and organizations to ensure that individuals sought for improved water and sanitation [32]. Governments were to ensure that individual right holders are protected and respected by making sure that water and sanitation are available, accessible, acceptable, affordable, and of good quality [33].

With international governance being directed by human right frameworks, access to water and sanitation has moved from

being a moral responsibility to international legal accountability. The international legal institution under the UN's human rights system has helped to move the right to water and sanitation from being an indirect responsibility (such as human right to health, development, and good standard of living) to a direct responsibility [25]. Considering the importance of water and sanitation to human life, the UN Community on Economic, Social and Cultural Rights held that "the human right to water and sanitation is indispensable for leading a life in human dignity. It is a prerequisite for the realization of other human rights."

Water and sanitation have to be seen as composite human rights, as it continues to grow in scope and influence [34]. Neves-Silva et al. [35] established that the violation of the rights to water and sanitation also encourages the violation of other human rights, such as right to health and education, thereby giving strengths to the view of right to interrelationship and indivisibility.

The HRWS was established to ensure that access to water and sanitation becomes indispensable in ensuring better life conditions and other human rights [2]. States were to ensure that individual rights to sanitation are ensured without discrimination through safe, physical, accessible, and economic means. Aspects which were of importance to women and girls ensured that sanitary solutions must be hygienic, socially, and culturally acceptable thereby providing dignity and privacy to its users [30].

2.2. Africa

The problem of water and sanitation is a common issue in many African countries, although these countries confront the issue in various forms. Much of this is attributed to the huge disparities among rural and urban communities. As reported by Fayemi in 2023, on substantial implications for public health, the COVID-19 pandemic has shown significant deficiencies in water and sanitation systems. Africa, which has minimal prospect of achieving SDG-6 commitments by 2030, faces a particularly severe challenge. In SSA, only 20% of the population used a safely managed sanitation service in 2020, and only 26% had access to hand-washing facilities. As a result, access to water and sanitation services is relatively limited. According to SDG 6 snapshots supplied by UN Waters, just 6% of SSA's renewable water resources are being drained in terms of water stress.

According to Chitonge, Mokoena, and Kongo [36], although different African nations have distinct difficulties in this area, the enormous gaps among rural and urban areas constitute a shared problem. However, with regard to the progress made in relation to the SDGs, Chitonge, Mokoena, and Kongo [36] found that SSA is making insufficient progress toward achieving SDG 6. A significant section of the population still engages in open defecation and had no access to hygiene services as at 2020. According to the predicted coverage for essential sanitation and hygiene facilities by 2030, SSA will fall short of target 6.2, having a serious impact on the populace. This necessitates a thorough examination of the WASH system in SSA to pinpoint areas that require immediate interventions and an expansion of activity [29].

3. Research methodology

3.1. Study area

This study was carried out in three local government localities in Benin City, the state capital of Edo, Nigeria. The three major local government areas (LGAs) comprising of Oredo, Egor, and

Ikpoba-Okha formed the study area for the research. Benin City is located in the sub-humid tropical region between the latitudes of 6° 20' along with 6° 58'N and the longitudes of 5° 35' along with 5° 41'E of the Greenwich meridian [37], encompassing 1,204 square kilometers, with a total elevation of 77.8 meters higher than sea level and is situated in the Benin River Basin. Benin City's metro area had 1,841,000 residents in 2022, a growth of 3.31% from 2021 [38]. The study area was chosen, due to the researcher's acquaintance with the city. The researcher was born and raised in Benin City, where she saw how difficult it was to maintain proper sanitation and access to water.

3.2. Study design

The researcher used a descriptive design in collecting the data in order to categorize the attributes of the population in their natural environment. Descriptive designs enable researchers to understand the traits, frequencies, trends, and categories of data. The finding from a descriptive study design helps to formulate hypotheses for future research, although it cannot be used to establish the cause and effect of a problem. So, using a descriptive study enables researchers to gather data that can be useful for future research [39]. The descriptive design approach is important for this study because it will enable the researcher to gain more understanding of the issue, water and sanitation affecting the people of Benin City, and be able to indicate appropriate ways in achieving the SDG 6 for this community.

The study also adopted a quantitative research approach. The main reason for this decision was to capture information from the original source. A quantitative approach enables the researcher to capture information from a larger population and evaluates it without taking into account the respondents' attitudes through the use of various statistical instruments [30]. This was the most effective approach to enable the researcher to have access to the research's goals and objectives. A quantitative approach is said to be impartial and so the researcher is expected to examine the data, measure, and interpret them. By utilizing the original data produced from the statistical analysis, a quantitative approach may offer a result that is more objective and conclusive.

Primary data was collected for this research because of its level of accuracy and reliability since it was collected from the respondents directly. Using quantitative approach enables the researcher to collect data in a numerical manner which can be put in ranks and categories for analysis. Structured questionnaires were used in collecting the data. This offered the respondents equal opportunity of answering the same question.

3.2.1. Population and sample size

The population comprises of male and female, age ranging from 20 and above located in places such as homes, schools, markets, business centers, workshops, and public spaces within the three chosen local areas. These locations made it easier to meet and interact with individuals during the survey, and random sampling was employed. The size was calculated using a Raosoft calculator at a margin of error 5%, 95% confidence limit. In total, 150 questionnaires were distributed equally among the three LGAs and 127 was retrieved.

3.3. Data collection procedure

Pritha [32] describes data collection as obtaining observations through a methodical approach. Direct observation, surveys,

open-ended questionnaires, in-person interviews, and document reviews are some of the means employed to collect data [40]. Structured questionnaires were largely used to collect data, and they were distributed at locations such as homes, schools, markets, business centers, workshops, and public spaces within the three chosen local areas. These locations made it easier to meet and interact with individuals during the survey. With the aid of research assistants, 150 questionnaires were distributed equally among the three LGAs (50 each), and the research assistants received training on the study’s topic. This was done to ensure the research assistants had the competencies they needed to do the task that had been allocated to them.

3.4. Data analysis

One of the most important stages in the majority of research study is data analysis, which calls for the use of statistical techniques to examine specific data trends, data patterns, as well as data sets [31]. Data analysis was carried out using thematic analysis and descriptive statistics. Microsoft Excel was used to process the raw data and Statistical Package for Social Sciences (SPSS) was used to analyze the data. The information was presented in tables, charts, and graphs.

3.5. Ethical consideration

An ethical clearance was obtained from the ethics committee of the University of Bolton. For every location that was selected, individual informed written consent was obtained from them. The respondents were made aware of the objectives of the survey, potential harms, and benefits and their right not to participate if they prefer not to do so. The identity of the respondents was anonymized using subject identifier codes instead of names.

4. Results and discussion

4.1. Socio-demographic characteristics of the respondents

The study was conducted in three (3) local government areas (Egor, Oredo, and Ikpoba-Okha) in Benin City, Nigeria. It was observed that Egor and Oredo contributed the highest response rate with 43 (33.9%) each and Ikpoba-Okha with 41 (32.3%). The study also looked at the sex and age of the respondents, the number of females were 68 (53.5%) and male 59 (46.5%), with the lowest age group 20–29 years has 35 (27.6%) and the highest group 50 and above has 32 (25.2%). The average age of the respondents was 32. The various age groups were equally represented and hence the results of the study were not biased by the age distribution. 53.5% (68) were married while 38 (29.9) were single, the remaining indicated to have been divorced or separated. 64.5% were observed to be self-employed businessmen and women/traders with 18.9% civil servants while others constitute 11.0% and 5.5% pensioners. The result further showed that most of the respondents have gained formal education: 53.5% HND/degree, 13.4% postgraduate, and 22.8% secondary. It was shown that majority of the respondents (66.1%) have between three and six numbers of people per household, 15.0% indicate to have 7–10 and 14.2% has 0.2 number of people per household. **Tables 1** and **2** shows socio-demographic characteristics of respondents.

Table 1 • Participant consent results of respondents (n = 127)

Q1_participant consent	Frequency	Percent
Yes	127	100.0
Total	127	100.0

Table 2 • Socio-demographic characteristics of respondents Q2 to Q8

Variable	Frequency	Percentage
Location of respondents		
Egor	43	33.9
Oredo	43	33.9
Ikpoba-okha	41	32.3
Sex of respondents		
Male	59	46.5
Female	68	53.5
Age of respondents		
20–29	35	27.6
30–39	32	25.2
40–49	28	22.0
50 and above	32	25.2
Marital status of respondents		
Single	38	29.9
Married	68	53.5
Divorced	11	8.7
Separated	10	7.9
Occupation		
Civil servant	24	18.9
Pensioner	7	5.5
Businessman/woman	62	48.8
Trader	20	15.7
Others	14	11.0
Educational qualification		
Primary	5	3.9
No formal education	8	6.3
Secondary	29	22.8
HND/degree	68	53.5
Postgraduate	17	13.4
Number of people per household		
0–2	18	14.2
3–6	84	66.1
7–10	19	15.0
11–15	4	3.1
16 and above	2	1.6

Source: Field Survey by Researcher, May 2023.

4.2. Analysis in relation to water and sanitation quality, availability, safety, and affordability

According to the SDG 6 agenda and HRWS, water is meant to be affordable, acceptable, accessible, available, and of good quality. However, the result of the study indicates that water was not affordable to the common household with 82.7% saying water

was expensive. 63.8% indicated to have challenge to access or availability to water and sanitation. 61.4% found water not to be safe for drinking while 84.3% indicated that the quality of water and sanitation in public places were of bad quality. This contradicts the principle of affordability, availability, and accessibility which is championed by HRWS [19]. The result of the respondents is graphically represented in **Figures 1–4**.

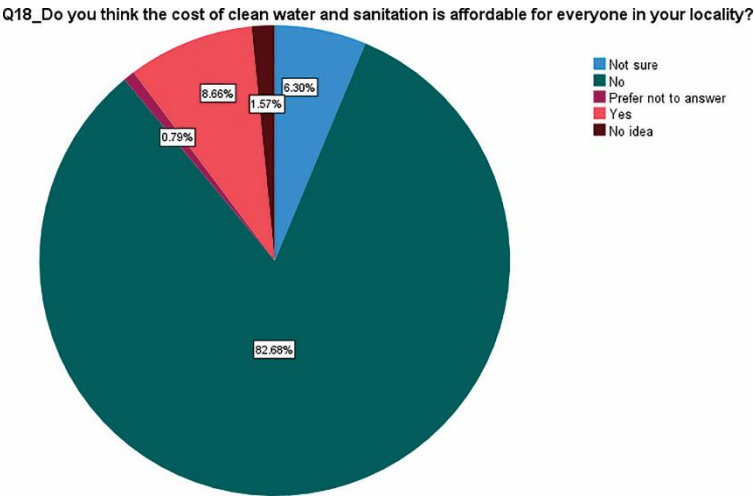


Figure 1 • Affordability of clean water and sanitation in the locality.

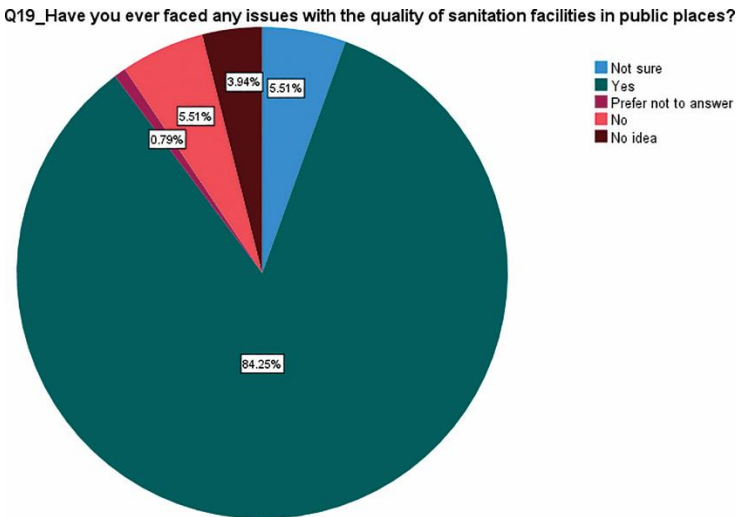


Figure 2 • Issues faced with the quality of sanitation facilities in public places.

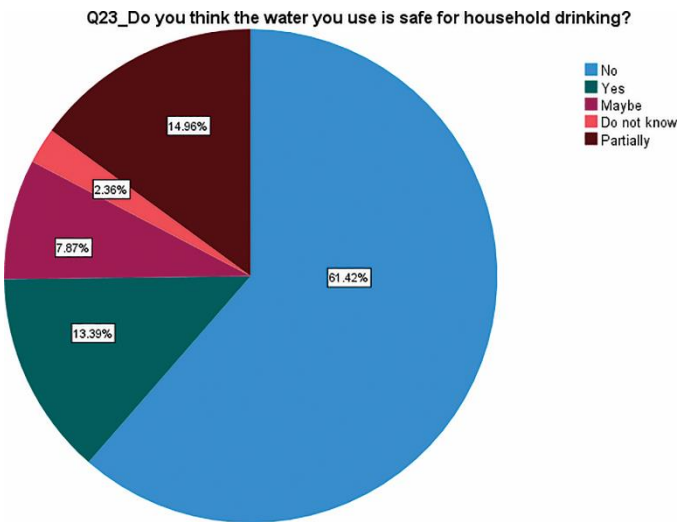


Figure 3 • Is household drinking water safe for use?

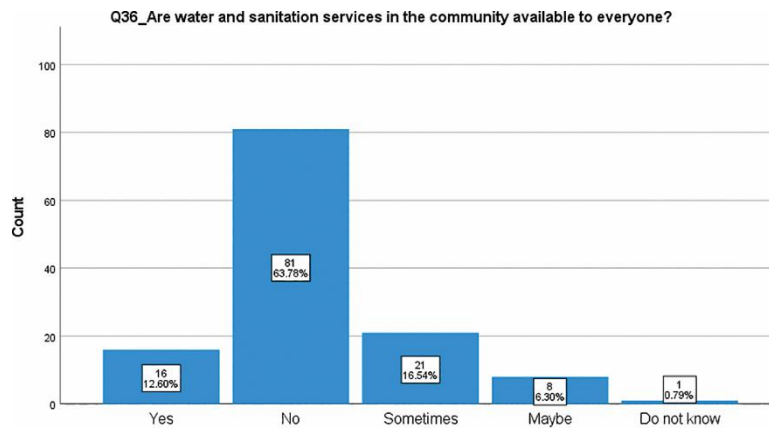


Figure 4 • Availability of water and sanitation.

4.3. Analysis in relation to effects of water and sanitation on gender discrimination, women and girl child education

This result revealed that 82.7% of the respondent's face gender discrimination issues in relation to water and sanitation, 74.5% of the people indicate to have faced issues of access to water and sanitation because of their social and economic status. Both genders in the household indicated to be affected when there is shortage of water in the house. The findings of this study do not support the assertion of [29], which found that lack of water is gender neutral, as it affects women and children more than men. It was observed that both male and female were responsible in

the fetching of water in the household; the distance covered to get water ranges from 1 to 3 km of which a maximum of six trips is required to get enough water into the house. This is against the fundamental guidelines advocated by UNICEF and WHO, which require the source of water to be within 1,000 meters or less to the house and not more than 30 minutes to get [11]. The shared responsible of fetching water by both genders is because of crimes such as rape that was faced by the female members of the household. This has informed the decision of the household to allow both women and young men to fetch water together as a way of protecting the females. The result is presented in **Figures 5–9**.

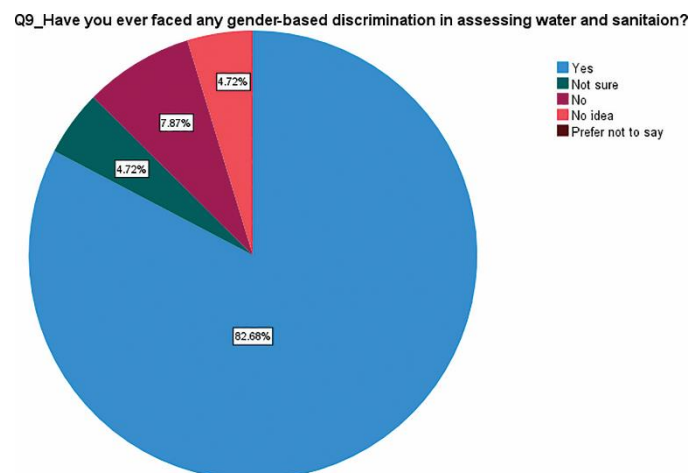


Figure 5 • Gender-based discrimination in assessing water and sanitation.

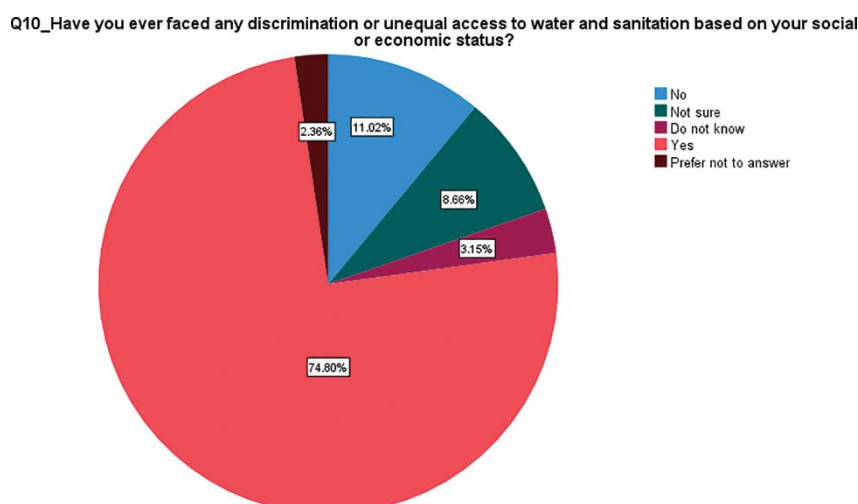


Figure 6 • Discrimination or unequal access to water and sanitation based on social or economic status.

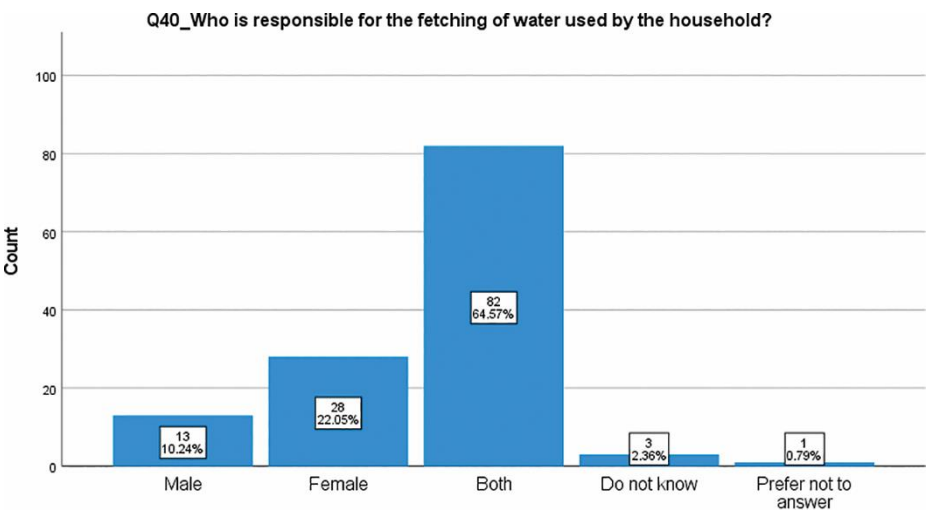


Figure 7 • Who is responsible for fetching water used by household?

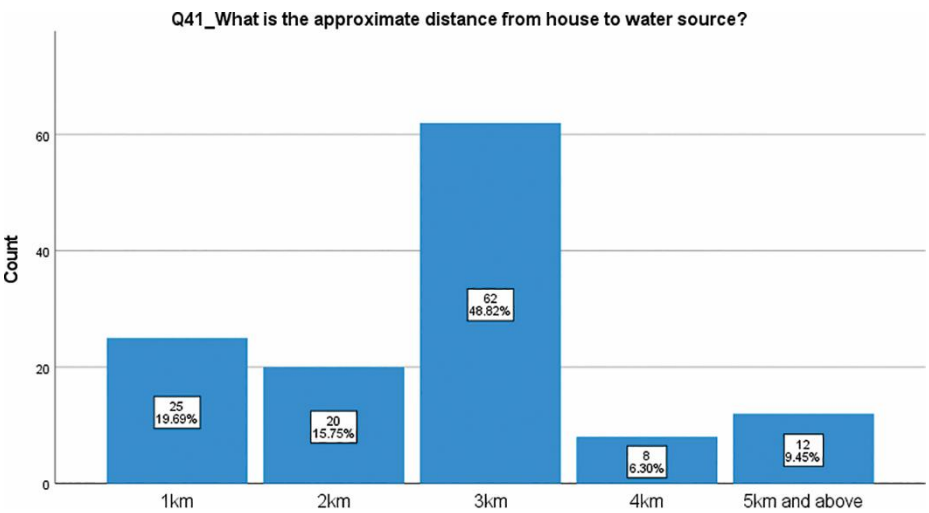


Figure 8 • Distance from house to water source.

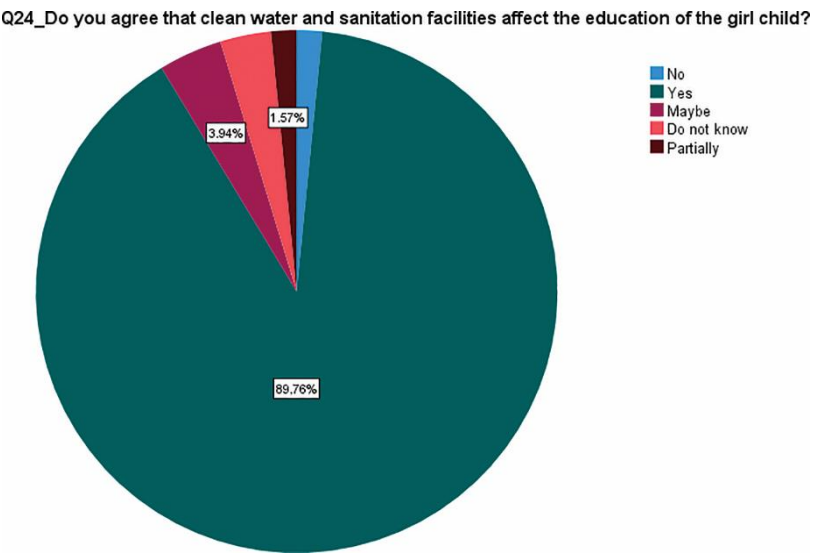


Figure 9 • How lack of clean water and sanitation affects child education?

4.4. Analysis on the importance of water and sanitation, water as a right, health and wellbeing

The importance of water and sanitation does play a major role in other developments in Nigeria. This was affirmed by most of the respondents (79.5%) who find it to be extremely important to have good access to water and sanitation. They were of the

agreement that clean water and sanitation affect the health and wellbeing (81.9%) of the inhabitant. This finding supports the study of Günther and Fink [25] that good water and sanitation helps to reduce child diseases and child mortality from 17% to 7%. In addition, it supports the argument that improved water and sanitation have a great effect on reducing health-related risks [3] and maternal mortality [26]. The majority (77.2%) were in

support of the option that access to water and sanitation should be a right of the original citizenry. Hence, the violation of one’s right to water and sanitation may lead to the violation of their other human rights such as right to health and right to education

[35]. A greater number of the respondents (85.8%) were ready to participate in activities geared toward improving water and sanitation. Graphical representation of respondent is shown in **Figures 10–12**.

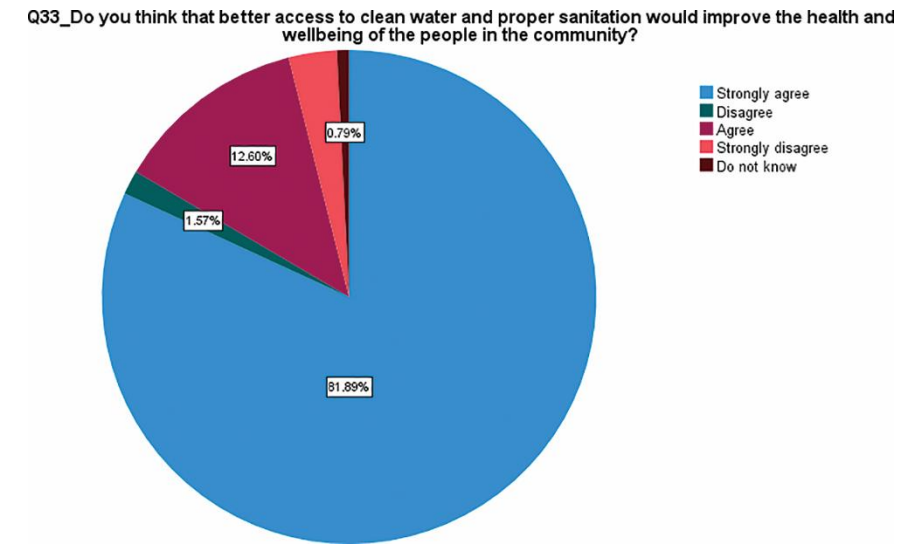


Figure 10 • How better access to water and sanitation will improve health and wellbeing?

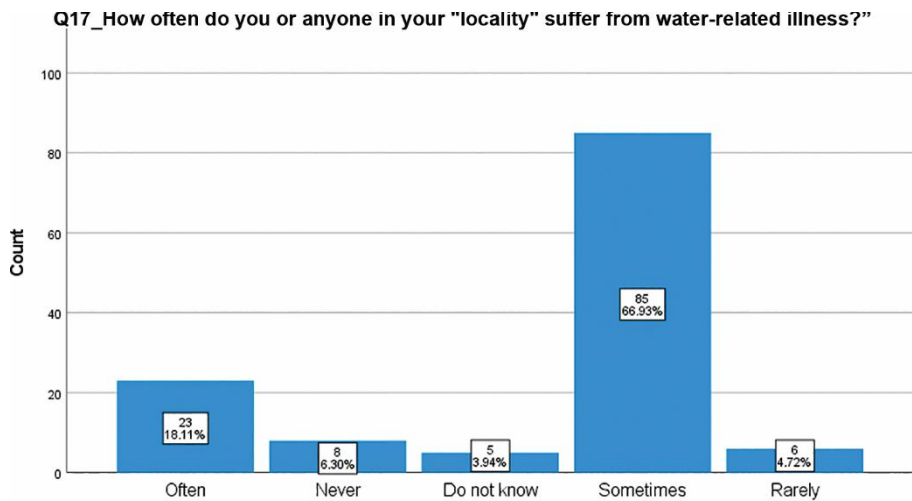


Figure 11 • Frequency in water-related illness.

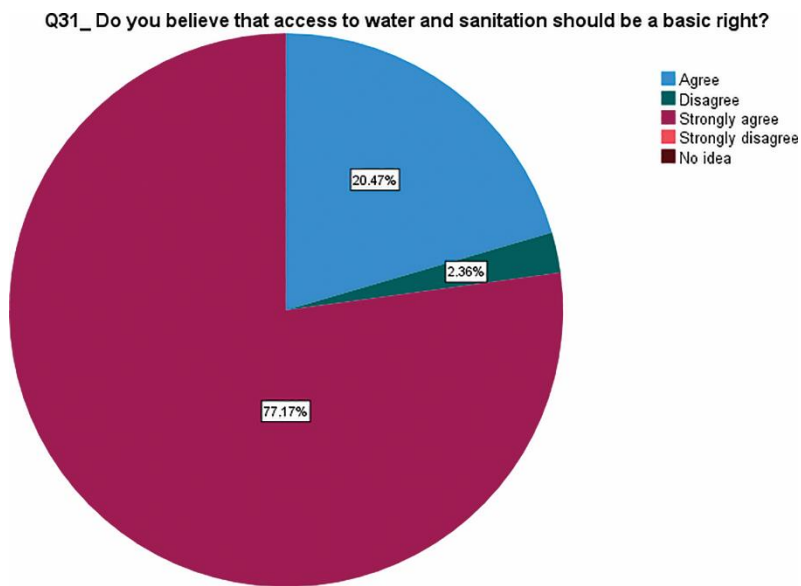


Figure 12 • Access to water and sanitation as basic right.

4.5. Analysis on government and council’s efforts toward water and sanitation services

The effort and activities of the central and local government to improve access to water and sanitation cannot be over emphasized; frequent power cuts which affect the pump stations of water supply facilities was a major factor which affect access to water and proper sanitation. Over half of the respondents claimed to experience intermittent water shortage due to this frequent power cut. The respondent (84.3%) indicated that there were little efforts made by the government to provide clean water and sanitation facilities. The majority of them said to have

occasionally (70.1%) or never (16.5%) received information about water and sanitation. A sub-essential number (92.1%) were of the suggestion that the government should conduct regular health and safety inspections on public rest area and water storage facilities. In addition, the majority (94.5%) of the people suggested that the government should allocate enough funds to improve water and sanitation. The study supports the findings to Chitonge, Mokoena, and Kongo [36], that Nigerian government is not making enough progress in providing improved water and sanitation for its citizens. Graphical representation of respondents is presented in **Figures 13** and **14**.

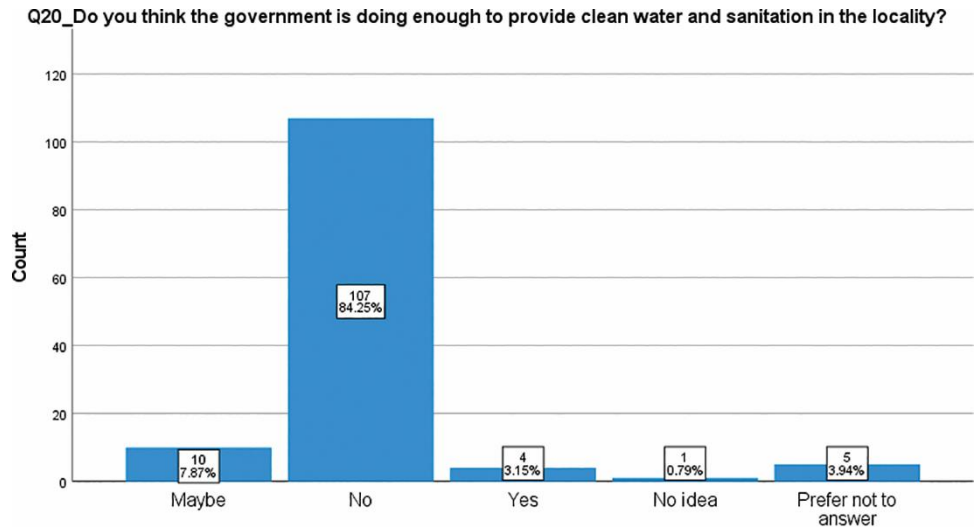


Figure 13 • Government effort to provide clean water and sanitation.

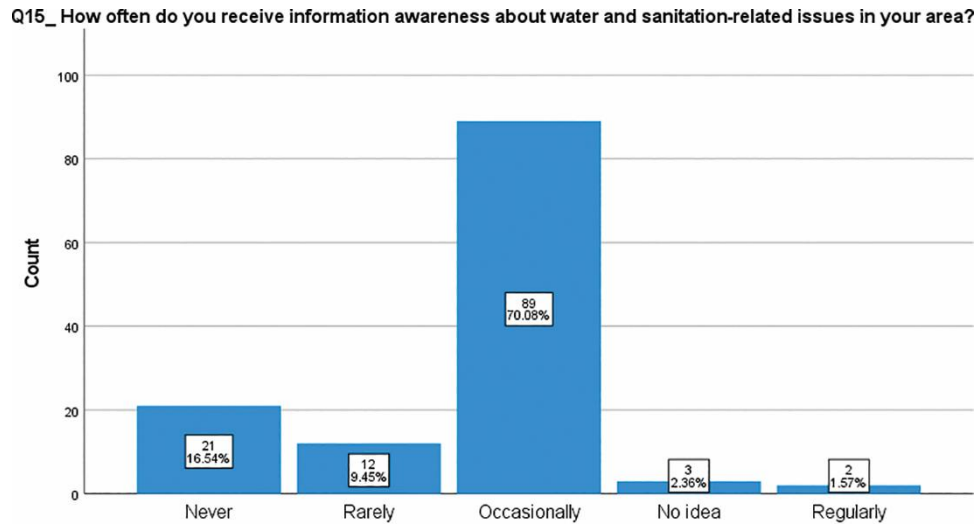


Figure 14 • Information about water and sanitation.

4.6. Discussion

According to the findings of the study, the problem of accessibility, affordability, quality, acceptability, and availability is still prevalent in the three localities. On accessibility, the respondent reported to travel or walk between 1 and 3 km to fetch water for household use. The cost of water is said to be expensive with monthly expenses per household ranging above 2,000 naira and some of them also indicated to spend more in getting access to clean drinking water. For instance, some of the households pay extra cost to get sachet/bottled water for drinking due to the poor quality of water sources from taps, boreholes, rivers, and others. Frequent power cuts were identified as some of the challenges to

the supply of water from government pump station and taps. Moreover, it was evident in the study that people face challenges on the principle of “fairness of access.” They face various forms of discrimination because of their social or economic class. The problems confronting the achievements of SDG in Benin City can be summed up as high population growth and demand for water, inefficient monitoring and funding from government, and inadequate public awareness and education. One of the major advantages of having a good water and sanitation management systems is its significant effect on public health and finances. This also helps in promoting environmental

sustainability and human advancement [10]. It is an undeniable fact that having access to safe water and sanitation facilities as well as sensitization of proper hygiene could lead to the reduction of water and sanitation-related diseases and mortalities caused by preventable infections, and this helps to promote better health, reduce poverty, and increase the welfare of people [23].

In addition, the stress on public health systems is reduced and the expenditure incurred in procuring vaccines and other medications in the treatment of these diseases could be reinvested in other productive areas of the economy. According to a report, 455 billion naira is spent on water and sanitation diseases and medical supplies [41]. In the event of a disease outbreak such as cholera or the COVID-19 pandemic, the economy may be disabled, and the government will have to spend huge sums of funds in controlling the outbreak rather than investing such funds in productive areas to improve the standard of life of the people [41].

The achievement of the targets of SDG 6 has an overarching effect on other goals. For instance, by providing available water and sanitation for all, the objective of SDG 2 is also achieved [42]. In the sense that having enough safe water for drinking and other purposes will help to “end hunger, improve nutrition, achieve food security, and promote sustainable agriculture”. In Benin City as well as in any other part of the country, water forms a most important part of people lives, for use at homes and for agricultural purposes. Having access to safe and drinking water is important in eradicating hunger and malnutrition. Water pollution caused by synthetic compound and other chemicals pose a challenge of transporting these to various treatment networks leading to high cost of water, dehydration, and stunted growth in children. So, it is therefore important for the Nigerian government to provide safe water and sanitation for its people, as this helps to promote their welfare and advancement of the society (**Figure 15**).

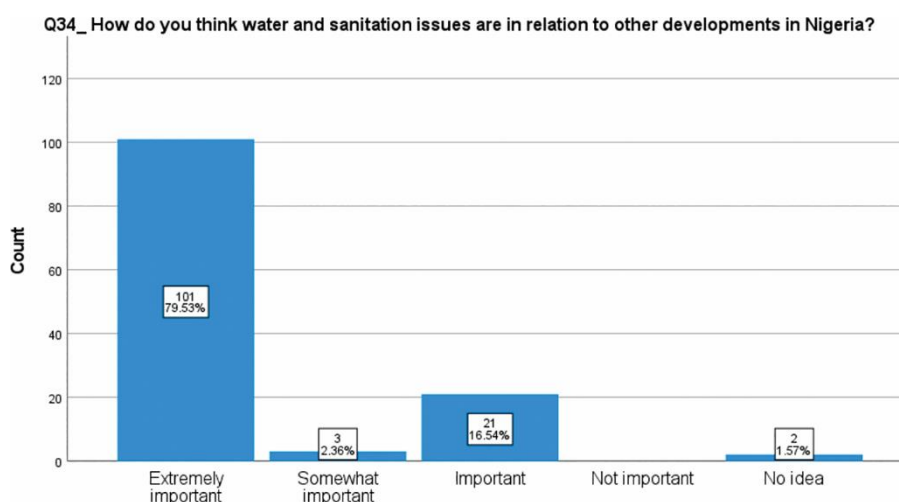


Figure 15 • Importance of water and sanitation in relation to other developments in Nigeria.

SDG 6.2’s major goals of the initiative are to achieve access to sufficient and equitable hygiene and sanitation for everyone, eradicate open defecation, and giving special focus on the requirements of women, girls, as well as those in vulnerable conditions [17]. Inadequate knowledge on the dangers of open defecation exposes the community to the spread of diseases and loss of lives. This is a major health and gender issue, especially those under the age of five are usually faced with a lot of diseases such as cholera, malaria, and stunted growth as a result of using contaminated water and food [41].

Women and girl children also face various security issues and abuses when they go out to defecate; ladies become susceptible to a number of infections and reproductive issues. WASH are extremely important for the empowerment of women and girls, as this affects their education, income, health, and safety.

Moreover, if women are not overburdened having to walk long distances to fetch water, it saves them a lot of time for other purposes. Also, their safety and security are secured if they are not to use a shared sanitation facility with other households. Women are spared of the psychological stress, improved wellbeing, and better education when their WASH needs during menstruation, pregnancy, and childcare are provided.

Nigeria as part of the UN was one of the many countries that embraced the new worldwide target for sustainable development.

As of 2015, 60 million of the Nigerian general populace lacked essential access to water, while only 33% of people have access to essential sanitation facilities. Looking at the extent of the situation, the Nigerian government in 2018 made an emergency declaration in the nation’s water and sanitation sector and established the National Action Plan (NAP) to rehabilitate the sector. In consistent with the SDG 6.1 and 6.2, the primary objective of the NAP was to ensure that there is sustainable and well controlled water and sanitation services accessible to the populace by 2030 [33]. This great step showed and acknowledged by the government that the WASH sector needs to be looked at, and that failure to adhere to the challenges in the sector will have detrimental effects for the country.

5. Conclusion

The Nigerian Federal Government has made a conscious effort with the establishment of the NAP to revitalize the WASH sector of the country. However, the country is still lagging in achieving the objectives of SDG 6.1 and 6.2 as well as that of the NAP. The findings of this study have revealed that notwithstanding the efforts by the government and other development partners, there are still places like the three LGAs used in the study who still have accessibility issues in relation to WASH services. As a result of the high rate of population growth in Nigeria and the increase in rural–urban migration leading to setting up of slums in the urban

areas, there is still more expected of the government to provide enough and safe WASH services to the population. The impact of the COVID-19 in addition to political instability in some parts of the country has led to lack of funds by the Federal Government to execute some of these projects to meet the SDG 6.1 and 6.2 targets.

Access to WASH services is greatly important for reviving and assuring socioeconomic development and support for life and a sustainable environment of any nation. Each of the SDG goals has been designed to supplement the work of the other to achieve the ultimate goal worldwide. While the Federal Government has put in efforts to attain these goals, more conscious efforts are needed together with its development partners to be able to achieve the SDGs 6.1 and 6.2 by 2030.

The findings of the study have showed that there is still problem of accessibility, acceptability, availability, affordability, and of good quality. I recommend that, although the Federal Government of Nigeria has taken some steps to ensure the attainment of the said SDG targets, there is the need for broader stakeholder engagement at all levels in order to ascertain the actual WASH problem confronting the communities in order to find the right solution to them. There is the need for extensive sensitization to the populace on the need to maintain good environment and personal hygiene and the need for using best practices in the treatment and preservation of water,

Finally, there is the need to continually offer assurances and safety to women and the girl child who are mostly affected by insufficient water and sanitation services.

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Author contributions

The authors declare that all authors contributed equally, approve of this work, and take full responsibility. The article was written by Ruth Ogbonmwan and supervised by Furat Al-Faraj.

Conflict of interest

The authors declare no conflict of interest.

Data availability statement

Data supporting these findings are available within the article, at <https://doi.org/10.20935/AcadEnvSci6145>.

Institutional review board statement

This study was conducted according to the guidelines of the Declaration of Helsinki, and approved by the University of Bolton (23 March 2023).

Informed consent statement

The authors declare that human participants were involved in the study, and have attached all relevant informed consent forms.

Sample availability

The authors declare no physical samples were used in the study.

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