International Journal of Research Findings in Engineering, Science and Technology | IJRFEST
p-ISSN: 2315-8417 | e-ISSN: 2489-0138
Volume 6, Number 1 November, 2024

Analysis of Potable Water Challenge in the Coastal Area of Ondo State, Nigeria

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Article DOI: 10.48028/iiprds/ijrfest.v6.i1.06

Abstract

Water is one of the most basic essential and fundamental needs of life, which covered about 70% of the earth's surface. In spite of this, just 0.3% of the world's water resources are actually usable, with over a billion people lacking access to clean drinking water in many parts of the planet. For most developing countries, getting access to clean water is a serious issue, especially in light of the grave health risks associated with sources of contaminated water. The world's heightened awareness and sensitivity towards our water resources can be largely attributed to this scenario. There is a growing demand for water due to the growing global population. Unfortunately, water resources are depleting, becoming more contaminated, and being utilized subconsciously due to a variety of factors, particularly human activity. The study aimed to appraise Potable Water challenge in the Coastal areas of Ondo State, Nigeria. The study adopted survey research. The sampling frame was 247,405 while the sample size was 504, and systematic techniques were adopted in administering the questionnaire, which was the research instrument. The study revealed poor water quality in the study area, qualitative water shortage, water salinization and high cost of water among others. The paper posited the establishment of desalination plants, watershed management, sustainable coastal zone planning, funds to be allocated to coastal infrastructure development that will guarantee stable and sustainable potable water supply in the study area with a view to meeting the sustainable development goal six.

Keywords: *Water management, Water availability, Water scarcity, Water accessibility, Water affordability*

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Background to the Study

Water as a universal solvent is indeed a necessity of life and as such maintaining the quality of drinking water cannot be over-emphasized. Access to safe drinking-water is important as a health and development issue at national, regional and local levels. Water is an essential natural resource that is vital for ecosystem functioning and human well-being as well as essential component of life. Water is regarded as one of life's essentials since it cannot be replaced and is required for socioeconomic endeavours including farming, mining, food production, and ecosystem maintenance (Bello, Abdullahi, Shehu, and Idris, 2018). Water is a crucial and necessary element and one of nature's greatest gifts to humanity; it is necessary for survival and one of the most crucial components of good health. Access to safe potable water is one of the fundamental human right (Belay et al, 2021; De Guzman et al., 2023) in spite of this, the United Nations Children's Fund (UNICEF) and the World Health Organization (WHO, 2019) reported that approximately 800 million people across the world still do not have access to safe drinking water. Again, water stands to be another important factor in shaping people's quality of life. People are worried these days about the quality of the water they consume. Only 1% of the earth's surface is covered in water, despite the fact that water makes up more than 70% of the planet (Bello, et al., 2018). Almost everywhere in the globe has seen significant improvements in the previous several decades in terms of access to clean drinking water. However, the United Nations Children's Fund (UNICEF), 2017 reports that 57 million people in Nigeria have no access to portable water, making the situation more concerning.

Globally, there is a drawback in availability of potable water and this is increasing and duplicating itself thereby intensifying the struggle for scarce water resources (Olukanni, Busari, and Ogundeji, 2015). In Nigeria, access to potable water supply has remained an important and challenging issue in water resources development and management (Christiana, 2017; Egun and Oboh, 2023). The demand for freshwater has been rising quickly worldwide as economies and human populations rise. Water scarcity not only jeopardizes human food supplies but also drastically lowers biodiversity in terrestrial and aquatic ecosystems. Our essential water supplies are under increasing pressure due to the negative consequences of climate change, population growth, and changing lifestyles, which is causing significant water stress in many nations including Nigeria and in particular, coastal areas. As a result, the pressing need to save water provision is becoming increasingly apparent. Water is vital to life since it has a significant impact on living standards and public health and consequently, quality of life. In light of the relationship that exists between access to potable water and health and invariably quality of life, it is imperative that the problems associated with a sustainable water supply are addressed.

Over the past three to four decades, one of the reoccurring challenges on the developmental agenda of many developing countries has been access to a clean supply of water. The fact that billions of dollars are being invested to achieve the objective of this "universal service" shows how seriously the provision of safe water is taken, especially in light of the growing and accelerated rate of world's population (Mukuhlani and Mandlenkosi, 2014). In order to meet the post-2015 development target sustainable development goals (SDG 6) on household water, a major priority must be channeled to water security due to the growing demand for and use of

water resources as well as other environmental resources (Centre for International Governance Innovation (CIGI), 2012). Water scarcity is widespread phenomenal throughout Nigeria, with the public water supply being erratic and often inaccessible. As a result, people rely heavily on unsafe alternative water sources, which increases the risk of waterborne diseases such as dysentery and typhoid fever (Bello, et al., 2018). According to the World Health Organization/UNICEF (2021), approximately 86% of Nigeria's population does not have access to safely managed and improved drinking water despite having ample surface water bodies and groundwater resources, particularly in the coastal area.

In Nigeria, nearly 60 million people do not have access to even the most basic clean water (Water Aid, 2023; Aminu and Nyor, 2021). It was projected that by 2050, water stress, insufficient cost recovery, inadequate water governance, and unequal service delivery are predicted to account for 90% of the world's urban population growth in Africa and Asia alone. Under the current climatic scenario, it is predicted that between 24 million and 700 million people will be forced from their homes worldwide due to water scarcity by 2030 (Water Aid, 2023). Like any other part of Nigeria, coastal area in particular, potable water is of a serious demand due to scarcity of safe water supply. The coastal area of Ondo State, Nigeria, is experiencing potable water shortage. This is because public water supply is inaccessible by residents of the study area. Hence, the people were forced to rely increasingly on hazard-filled alternative sources of water, which increase their risk of contracting water-borne illnesses like typhoid fever and dysentery. This makes it impossible to ignore the urgent need to guarantee enough clean water and address issues related to water security. As a result, this study appraised potable water shortage in the study area with a view to curtailing the attendant problems through appropriate policy frameworks in meeting the sustainable development goal six in the study area.

Literature Review

Water is a vital element for the existence and sustainability of all living forms on Earth, making it a significant environmental component. Water is therefore becoming more and more necessary as a result of rapid population expansion, urbanization, and other human-caused issues. people also require a lot of water to survive; Nester et al. (2004) state that people require a lot of water daily. In Nigeria, the development and management of water resources has always faced significant challenges, one of which is the availability of a potable water supply (Christiana, 2017; Egun and Oboh, 2023). The World Water Council (2006) asserts that there is no way to separate the right to water from human dignity. In 2010, resolutions passed by the UN General Assembly and Human Rights Council strengthened political acknowledgement of human access to clean drinking water and sanitary facilities. Everyone now has access to enough reasonably priced, safe, and aesthetically pleasing water for all purposes thanks to the right to water (CERCR, 2002). A sustainable future depends on having access to a sufficient and drinkable water supply (WWAP, 2015; Lu et al., 2023). Nigeria's access to clean water has been declining.

Globally, the harm to health, economic productivity and quality of life that can result from inadequate potable water supplies have been realized and understood. In view of this, the

countries have mounted efforts to curtail the attendant problem. In view of this, the international community as alleged its allegiance to improve water supplies by the period 2006 – 2015 the United Nations International Drinking Water Supply and Sanitation Decade as was earlier declared in the period 1981 – 1990 decade. Indisputably, water still remain the most vital source of all forms of human development (Christopher, 2019).

It was found that large populace in Nigeria lack access to potable water for use. The rural communities have about 71% that have access to good water supply, while only 42% can be said for those in urban and semi urban areas. Previous research in Nigeria as shown that there is high level of lack of good water and water borne diseases (Federal Republic of Nigeria, 2000). There is scarcity of potable water supply to most places in Nigeria while the importance of water cannot be overestimated (Odafivwotu and Abel, 2014; Young et al., 2023a). The depth to which water resources development benefit the economic productivity and social wellbeing is always undervalue, though all social and economic activities depend greatly on quality of freshwater supply (Ghosh et al., 2022). Water- related diseases are the most common cause of illness and death among poor in developing countries (World Water Council, 2005; Mukhopadhyay et al., 2022).

Despite the significance of adequate water supply to humans, access to clean water and its supply in Nigeria cities is low. An example, the joint report on water and sanitation by the WHO/UNICEF as shown that Nigeria and many other Sub-Sahara Africa countries are slow in achieving the millennium development goals and targets set for water and sanitation, as drinking water coverage in Nigeria decreased from 49 per cent in 1990 to 48 per cent in 2004, as against the expected coverage (WHO/UNICEF, 2006). The generous universal liquid on earth's surface is water which has unique characteristics that can sustains life (Meseret, 2012). According to WHO evaluation, about 80% of the diseases in the world are gotten via contaminated water and poor sanitation (WHO, 2011; Organization, 2022). Nationwide, the challenge that accompany potable water treatment include but not defined to pumping costs, surface water contamination as a result of natural toxins such as ammonium, nitrates, sulphates, other substances arising from leakages of environmental pollutants (emission) originating from human activities. (Burke and Moench, 2000; FAO, 2003 and Richardson *et al.*, 2004; Fantin Irudaya Raj *et al.*, 2023; Oloruntoba *et al*, 2022). Despite some of the above mentioned, there is low influence of the governments particularly in the developing countries round the world. Standard technological know-how, intense knowledge and important information on surface water sources with corresponding total quality management are insignificant in the developing countries and at the international community also (Villholth, 2006; Ugwu *et al.*, 2022).

Clean water treatment plants in developing countries are faced with challenges of operations, treatment chemicals, machinery efficiency, insufficient equipment, lack of skilled manpower and dedication. These issues could imminently result to low standard of product that are produced. Water borne diseases which have been reported are caused by the presence of pathogenic microorganisms in drinking water which are some of the deadliest diseases known to mankind. Water for human consumption must therefore be potable, free from diseasing

causing microorganisms, chemical substances, and of low turbidity (WHO, 2011). Less than one-third population of the urban and rural dwellers in Nigeria can be said to have piped water supply on their property for consumption and the supply may be epileptic (Kumpel *et al.*, 2016). Generally, people depend on public standpipes and non-piped water for use, such as hand-dug well, boreholes, springs and water vendors (WHO/UNICEF, 2014). These sources of drinking water are classified as "improved drinking water sources" (WHO, 2011, Lindmark *et al.*, 2022). Improved drinking water source can be said to be effectively designed in such a way that the fountain is shielded particularly from fecal matters and other pollutants from external forces (WHO/JMPR, 2013, Daly and Harris, 2022). Various sources like rivers, streams, lakes and ponds from surface water and bottled water are categorized as "unimproved drinking water sources" (WHO, 2011). In remote villages, streams and rivers are the predominant sources of water for use which can be affected with environmental pollutants that emanates from abattoirs' waste or sewage particularly from downstream (Omole and Longe, 2008, Ofomatah *et al.*, 2023) and from industrial waste (Bello-Osagie and Omoruyi, 2012; Ifelebuegu *et al.*, 2017; Okoye *et al*, 2023).

In the cities where ground water sources (boreholes and deep wells) are the significant sources of clean water, pollution via leachates from metropolis solid landfill (Aboyeji and Eigbokhan, 2016) and industrial wastewater (Bello-Osagie and Omoruyi, 2012) remains critical public health concern. Consuming water infected by divers' microorganisms such as coliforms (Kumpel *et al.*, 2016, Okoye *et al.*, 2023), *Staphyloccocus aureus* and *Pseudomonas* species (Ibeneghu and Lamikanra, 2014; Simon-Oke *et al.*, 2023) have been recorded in Nigeria. Likewise, some chemical and toxic parameters like irons, calcium, chromium and aluminum have been found in surface water (Titilawo *et al.*, 2018) and also in packaged water - sachet (Emenike *et al.*, 2018), while in groundwater cadmium, lead, manganese and nickel can be found (Ayedun *et al.*, 2015) above acceptable margins for clean water. Other pollutants like fluoride (Emenike *et al.*, 2018) and light polycyclic aromatic hydrocarbons moreover have been recorded to be available in groundwater in levels above acceptable limits in some area in Nigeria (Adekunle *et al.*, 2017).

Increase in population, poor hygiene, inadequate infrastructure are contributory factors in consuming water sources that are contaminated with pathogens and harmful chemical. It is extrapolated that 1.1. billion people have restricted access to satisfying water distribution, which aftermath can cause diarrhea outbreak (about 4 billion cases) and demise (about 5 million per annum) globally (WHO, 2015). Research has shown over times that the insufficiency of clean water can be attributed to increase in population growth, inappropriate handling, disadvantaged unfavourably scheme enactment of water-related programs and rise in industrial exercises (Sibanda *et a*l., 2014; Kora *et al.*, 2017). These attendant problems can badly influence the access, availability, distribution, provision, and character of water and associated resources (Igbinosa and Okoh, 2009; Liang *et al.*, 2013; Simon-Oke *et al.*, 2023). Scarcity of water, particularly in developing countries like Nigeria where significant reports of waterborne infections and diseases such as diarrhea, cholera and typhoid occur as a consequence of poor sanitation and poverty (Coleman *et al.*, 2013; Igbinosa and Aighewi, 2017; Alkali *et al.*, 2022). In rural and urban areas in Nigeria, up to 66 million people do not

have sufficient clean drinking water supply which as cumulated in drinking impure water with potential adverse public health effects (WHO, 2015; Ologbushere *et al.*, 2016; Beshiru *et al.*, 2018)

The Study Area

The study area is in the extreme southern part of Ondo State as shown in figure 1. This is the Niger Delta Area and the oil producing region of Ondo State. It is bounded in the west by Ogun State, in the North by Okitipupa and Irele Local Government Council Area, in the East by Edo State, in the South-East by Delta State and the Atlantic Ocean. An expansive coastline, 180km-long is its southern boundary, thus making Ondo State the state with the longest coastline in Nigeria (Atitaye 1993). The region extends from longitude 4^0 28"E to longitude 5^0E and from latitude 5^0 to 45" N to latitude 6^0 25" N.

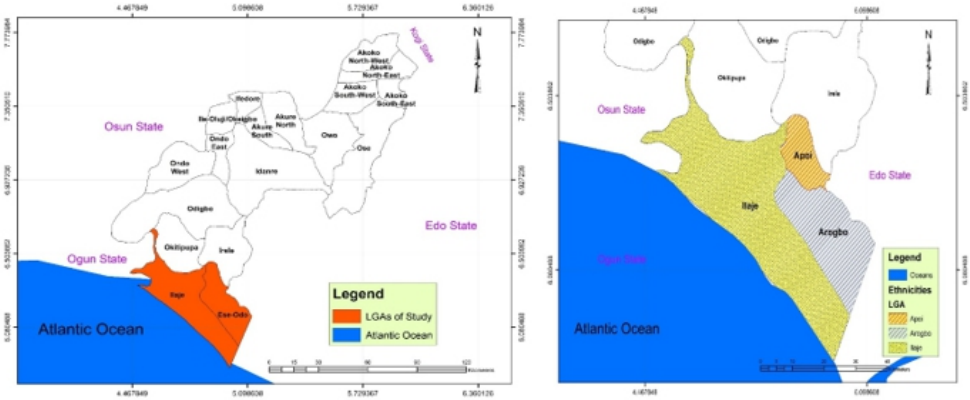

Figure 1&2: Map of Ondo State indicating the study area and Map of the study area reflecting the three ethnicities

Source: Ondo State ministry of physical Planning and Urban Development

Figure 3: Map of Ilaje and Ese-Odo Local Governments indicating sampled settlements in the study area

Source: Authors field survey, 2023

Materials and Methods

The information presented in this paper was sourced through primary and secondary sources. The primary source includes direct observation and physical measurement of the existing situation in the study area as well as administration of questionnaire. According to the National Population Commission (1991) the coastal area of Ondo State composed of a regional population of 287,023. In 2020 with 3.2% growth rate (National Bureau of Statistics, 2017) the coastal area has an estimated research population of 715,548. The study area has three ethnic groups, namely: Ilaje, Arogbo and Apoi. The study area comprises of 292 settlements, distributed such that Ilaje people inhabit 59% of the total settlements, Arogbo people occupies 26%, and Apoi people accounts for 15% of the settlements respectively. The Ilajes are the dominant ethnic group accounting for about 60% of the population. This is followed by the Arogbo-Ijaws a population of about 26%. The Apois occupy the third position, accounting for 14% of the population. On the basis of the above, 26 settlements were selected purposively and the human population of the 26 communities constituted the sampling frame, which was 247,407. The sample size for this study was 0.2% of the sampling frame, which will amount to 504 human population.

Data Presentation and Discussion of Findings

Access to Potable Water

Figure 4 revealed that 96% of the total respondents attested that they did not have access to potable water in the area at all. While a frequency of 20 which accounted for 4% of the total respondents said that they partially have access to potable water in the coastal area of the Ondo State. The implication of this is that there is high level of water degradation in the coastal area of Ondo State despite its abundance. Also, it showed that the majority of available water in the coastal area of Ondo State are not fit for human consumption and it is capable of impairing their health and consequently lower their quality of life.

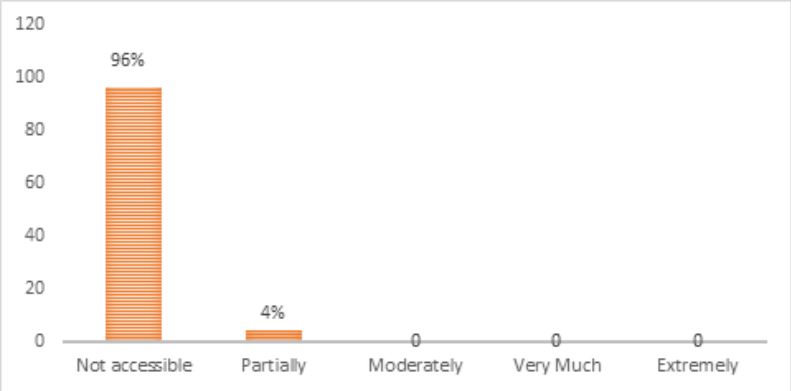

Figure 4: Accessibility to potable water
Source: Author's fieldwork, 2023

Source of Drinking Water

As depicted in figure 5, it shows that 2.2% of the total respondents claimed that their main source of drinking water is piped water. In the same vein, 3.4% of the respondents said that

their main source of drinking water was from dug wells. A total of 21.2% of the total respondents affirmed that surface was their source of drinking water in the study area. Also, 8% of the total respondents depended on rain water as their main source of drinking water in the study. 61.3% of the total respondents relied on packed water as their main source of drinking water and 9.1% of the total respondents depended on delivered water as their main source of drinking water in the study area. Looking at the analysis, the predominant main source of drinking water in the study area was sachet water, that is sachet and bottled water or plastic water as the case may be. This inferred that majority of respondents depended on sachet water for drinking which must be paid for before having access to it. It further established the fact that available natural water, be it surface or underground were not fit or suitable for human consumption. Picture below attested to the analysis that majority of the people depended on sachet water as their main source of drinking water in the study area.

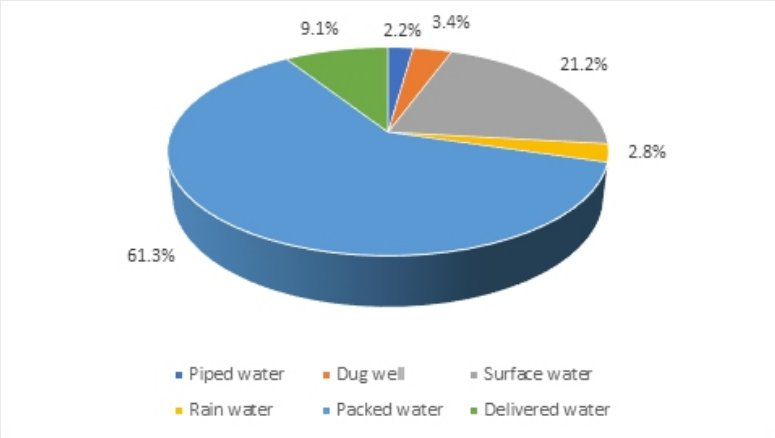

Figure 5: Source of Drinking Water
Source: Author's Fieldwork, 2023

Figure 6: Sachet water vendor as main source of drinking water
Source: Author's fieldwork, 2023

Source of Water used by members of Household for other Purposes

Figure 7 revealed that 1.8% of the total respondent claimed that piped water was their main source of water for other domestic activities. 5.4% of the total respondents said that their main source of water for the other domestic activities was dug wells. 8.5% of the respondents that relied on surface water for other domestic purposes in the area. Again, 6.7% of the total respondent said that their main source of water for other domestic purposes was main rain water and 1.0% of the total respondents depended on vendor water for other domestic activities aside drinking. The dominant source of water for other domestic purposes was surface water. This implied that majority of the respondents depended on unsustainable means of water for their other domestic purposes. The physical observation revealed that not all the surface water that could be used due to pollution and contamination of different kinds in the study area. The picture below showed some residents of the coastal at Etikan community scouting for water for other domestic purposes in the study area.

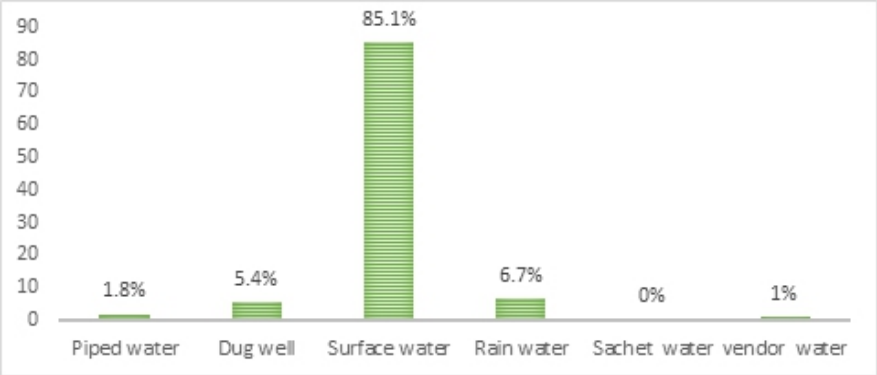

Figure 7: Source of water for other domestic purposes
Source: Author's fieldwork, 2023

Figure 8: Residents of Etikan scouting for water for other domestic uses
Source: Author's Fieldwork, 2023

Proximity of Water source to place of Residence

proximity to basic services such as water and sanitation is very key and fundamental to effective productivity and enhanced quality of life. As depicted in figure 9, it shows that 1.4% of the respondents claimed that they have had their main source of water located within permissible distance to their place of residence. In contrast to this claim was the declaration of 98.6% of the total respondents who said that their source of water was never located within a reasonable distance to their place of residence. Majority of the respondents did not have the source of their domestic water located within. This implied that sources of domestic water for the various purposes were not found within proximity.

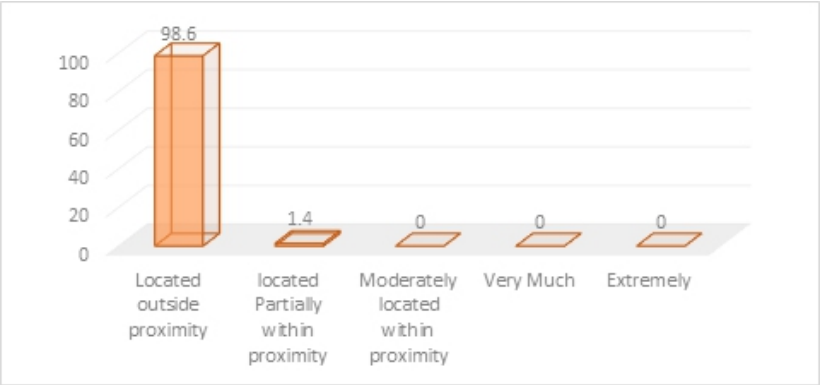

Figure 9: Source of Water for other Domestic purposes
Source: Author's fieldwork, 2023

Travel time to access main source of water for other domestic purpose

Figure 10 shows that 0.4% of the total respondents claimed that they usually access their potable for domestic purposes within 30minutes, which is in line with the World Health Organization Standard. This proportion of the total respondents was very infinitesimal. 1.6% of the total respondents said that they accessed their main source of water for other domestic purposes between 30-60minutes. In another development, 6.8% of the total respondents proved that they accessed their main source of water for domestic purposes between 61-90minutes. 31% of the total respondents attested that they usually access water for domestic purposes between 91-120 minutes. It means that this category of respondents cannot have access to water for their domestic purposes use than one to one hour, thirty minutes. In the same vein, another class of the respondents claimed that they can only access water for domestic purposes only when they might have travelled for one hour, thirty minutes to two hours. This means that this set of residents do not have access to water for other domestic purposes not until they have spent up to 2hours. Also, 60.1% of the total respondents' proof that they do not have access to water for domestic purposes unless they travel or spend over 2hours before the can secure water for their domestic usages. This will consequently reduce the quality of life of residents of the study area. The dominants travel time to access the main source of water for domestic purposes in the study area was over 120 minutes which was over two hours.

The implication of this is that household in the study area was facing water insecurity. This was because they could not fetch enough water that will permit or guarantee sufficiency in each within their proximity. Their travel time for domestic water in the study area was far above the stipulated 30 minutes threshold stipulated by the World Health Organization. This result was accorded by the report of WHO 2023 where it was stated that over 2billionn people live in water-stressed countries, which is expected to be exacerbated in some regions as a result of climate change and population growth. The source further noted that, globally, at least, 1.7billion people were drinking from water sources that were contaminated with faeces. Below is the arrival of people from water fetching at stipulated time.

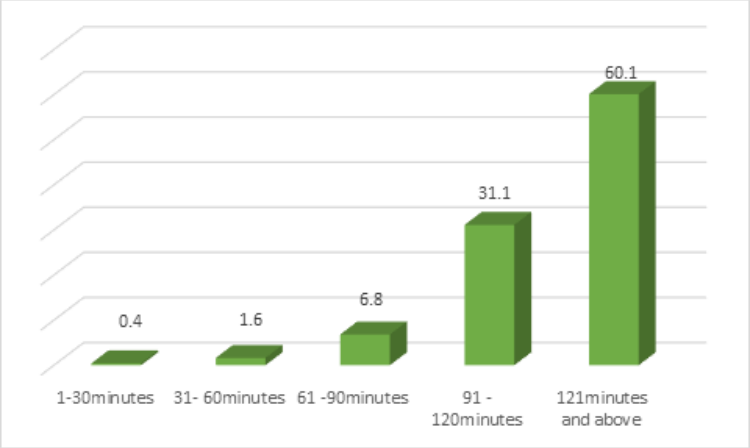

Figure 10: Travel time to access main source of water for other domestic purpose
Source: Author's fieldwork, 2023

Approximate distance to main source of water for domestic purposes
Proximity to potable water was considered to be necessary by UNICEF and WHO. This will apparently lower stress and enhance quality of life. Based on this, distance determination was considered to be ascertained in respect of probable distance being covered by residents of the study in searching for potable. The table below portrayed the average distance be covered by respondents in the study area. As depicted in figure 11, 0.4% of respondents said that they covered maximum of 100 metres in securing or accessing potable water for domestic purposes. This is acceptable and considered to be desirable by WHO and UNICEF. 2.8% of the respondents were with the view that they covered up to 200 metres before they can access potable water for their various domestic uses. In the same vein, 17.3% and 21.4% of the respondents claimed that they covered up to 400 metres and 5000 metres respectively before they can access potable water in the study area. Further still, 58.1% of the total respondents also submitted that they traversed up to a distance of over 500 meters before they could have access to potable water in the study area. From the foregoing, the highest proportion of the respondents moved out beyond the threshold of 100 metres recommended by WHO for household to access potable for all kinds of domestic purposes. The result was in line with the submission of WHO (2023) that posited that 1.8 billion people live in households with water supplies on the premises. USAID (2022) noted that millions of people in the developing

countries walking for 6 kilometers (approximately 3.5 miles) a day, carrying 20 litres of water. This translates to an average of more 15 hours a week. This inferred those respondents in the study area were passing through severe water stress, which is detrimental to quality of life.

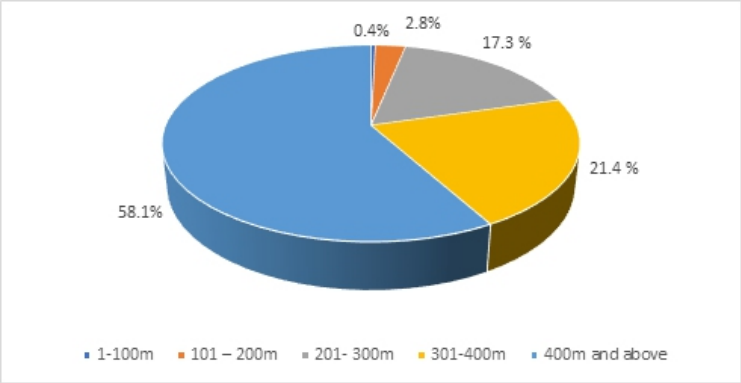

Figure 11: Approximate distance to main source of water for domestic purposes.
Source: Author's fieldwork, 2023

Frequency of Potable Water

Every household's demand for potable water either for drinking or other domestic uses depend grossly on their activities. Therefore, supply of water or access to potable water is expected to be regular and as frequent as possible. In view of this, assessing the frequency of potable water supply within the study area is important within the framework of this study. As depicted in figure 12, 2.4% of the respondents said that the supply of potable water was partially frequent. In this case, 2.4% of the total respondents were not all that facing water stress in their own household. In contrast to this, a frequency of 484, which accounted for 97.6% of the total respondents claimed that the supply of potable water in their household and the entire area were not frequent. In this regard, the greatest proportion of the respondents did not have access to frequent supply of potable in the study area. This implied that majority of the respondents were experiencing water stress and insecurity in the study area. This situation might likely constitute serious impediment to improved quality of life in the study area.

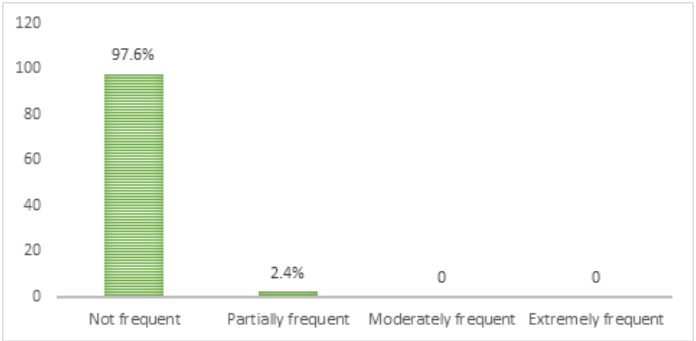

Figure 12: Frequency of Potable water
Source: Author's fieldwork, 2023

Connection of Houses to Public Piped Water

Figure 13 showed the detailed analysis of households connected to piped water in the study area. 94.4% of the respondents said that they were never connected to piped water at all 3.2% of the respondents indicated that their buildings were partially connected to piped water and 2.4% of the total respondents were moderately connected to public piped water. It was deducible from the analysis that majority of the respondents were not connected to piped water in the study area. It denotes that greater proportion of the coastal dwellers may have to move out beyond the benchmark of 100 metre travel distance recommended by United Nation before accessing potable water. It therefore means that the interest, dignity and overall quality of life for all cannot be achieved under this condition. Beyond, the interest of the vulnerable set within the entire population, such as the disabled, elderly, women and children had been overlooked and jeopardized. This result was accorded by UNNICEF Joint Monitoring Programme for Water Supply, Sanitation and Hygiene (2023) which posited that over 44 million people do not have access to piped water at home in Pan-European region. The scenario of the study area was similar to the global expression and other sub regions, where communities did not have access to piped water at home. This is a clear indication that coastal dwellers of Ondo State are undergoing severe stress before they could access negligible proportion of potable water that are suitable for domestic purposes.

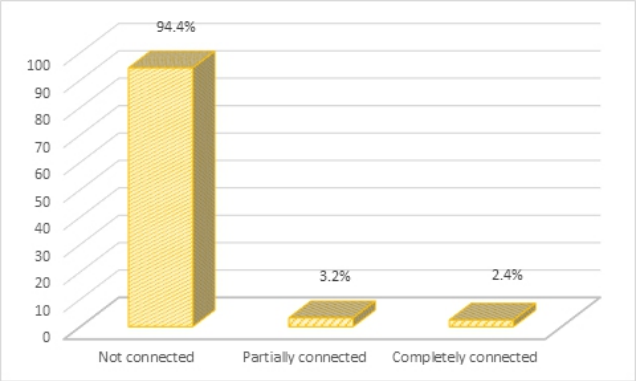

Figure 13: Connection of houses to public piped water
Source: Author's fieldwork, 2023

Table 1: Payment for Potable Water in the Study Area

Option	Frequency	Percentage
No Payment made	0	0.0
Partially pay	4	0.8
Moderately	0	0
Very Much	0	0
Extremely	492	99.2
Total	496	100

Source: Author's Fieldwork, 2023

Table 1 gives us the analysis of payment for potable water by the respondents. It was evident from the table 5 that only 0.8% of the total respondents claimed that they did not pay for water at all. 3.2% of the respondents indicated that they pay partially for potable water. 17.7% and 2.6% of the respondents attested that they moderately and very much before they could access or get potable water for their daily consumption. In another development, it was revealed 75.7% of the total respondents said that they paid extremely for potable water before they could access it. Mirror from the table, the majority of the respondents were paying huge amount of money before getting potable water. Ordinarily, residents of the coastal areas were not supposed to pay for potable water based on the availability of freshwater in the mangrove forest around the coastal area. However, due to severe and several environmental challenges such as oil exploration and exploitation, sea incursion and salt water, majority of the freshwater had been degraded, making residents of the coastal area to scouting or searching for potable and in most cases pay for potable water. This implied that getting potable water by residents of the coastal area of Ondo State was an acute problem or challenge that is capable of distorting their quality of life. It also inferred that the freshwater in the coastal were not protected and not safe for human consumption that could guarantee good quality of life.

Table 2: Percentage of income spent on Potable Water

Option	Frequency	Percentage
1-30%	188	38
31-60%	206	41.5
61-90%	40	8.0
90% and above	62	12.5
Total	496	100

Source: Author's fieldwork, 2023

The table showed that 38% of the respondents spent up to 3% of their monthly income to get potable water for their drinking and other domestic uses. This percentage is modest and acceptable. It falls within the benchmark standard by United Nation which is 3% maximally. 41.5% of the respondents claimed that they usually spend between 31 – 60% of their monthly income to secure potable water for both drinking and for other domestic activities. In the same vein, 8.0% of the respondent affirmed that they spent between 61 – 90% of their monthly income for procurement of both drinking water and for other domestic purposes and 12.5% said that they spent up to 91% and above of their monthly income on water for both drinking and other purposes. The dominant group claimed that they spent up to 31 – 60% of their income on the procurement of water, while in aggregate, 62% of the total respondents spent over the maximum 3% recommended by United Nations for Water Consumption. This inferred that despite the poverty level and low come level of the respondents much is being spent on water provision for their various household uses. This was an indication of major gap in terms of attainment of goal 6 of the sustainable development goals. This further revealed that the principle of water affordability under goal 6 of the sustainable development goal was lagging in the study area.

Level of Satisfaction of Access to Potable Water

Good practice to ensure equitable access to water necessary and expedient in the attainment of goal 6 of the sustainable development goal toward enhancement of good quality of life in the present age. Appraising respondents' satisfaction in terms of their condition of access to potable water is also key and fundamental in a study of this type. Figure 14 revealed level satisfaction level of respondents to access of potable water in the coastal areas of Ondo State. As shown in figure 14, a frequency of 8, which accounted for 1.6% of the respondents claimed that they were moderately satisfied with their condition of access to potable water for both drinking and other domestic purposes. 4.2% of the respondents said that they were partially satisfied with their condition of access to potable water for their household consumption either for drinking or other domestic purposes. In contrast to these claims and affirmation, a frequency of 467 representing 94.2% of the total respondents attested that they were never satisfied with their condition to potable water for their household consumption and utilization either for drinking and other purposes. The dominant class was the group of respondents that claimed that they were not satisfied at all with the condition of their access to potable water for their household. This inferred that means and process of sourcing for potable water was not acceptable and the respondents were experiencing water stress in the study area. It also means that the respondents did not have prompt access to potable water both for drinking and other domestic purposes in the study area. It further connotes that the people in the study area did not have access to continuous, sufficient and adequate supply of potable water for personal and domestic uses in the study area.

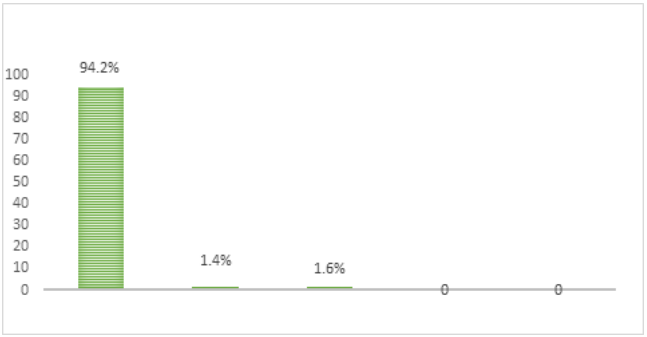

Figure 14: Level of Satisfaction of access to Potable Water
Source: Author's fieldwork, 2023

Table 3: The level Potable Water Satisfaction for Community Needs

Option	Frequency	Percentage
Not satisfied	473	95.4
Partially satisfied	17	3.4
Moderately satisfied	6	1.2
Very Much satisfied	0	0
Extremely satisfied	0	0
Total	496	100

Source: Author's fieldwork, 2023

Table 3 revealed the level of community satisfaction of potable water in the study area. 95.4% of the total respondents claimed that available potable water in the study area did not satisfy the community needs at all. 3.4% of the total respondents affirmed that available potable water partially satisfied the community water needs and 1.2% of the total respondents also said that available potable water moderately satisfied the community water needs. The dominant set was the group of respondents who claimed that available potable water did not satisfy the community needs at all. This implied that communities in the study area were experiencing incessant and acute potable water shortage area despite the abundance natural water resources that is available in the study area. This situation was further attested to through water analysis that was carried out in the study area.

Conclusion

Potable water is important and indispensable for sustenance of good quality of life. However, deterioration has characterized the most of the natural water resources across the globe in particular, the coastal areas. This has made most of the water in the coastal area unfit for human consumption thereby putting the residents of the coastal area at a disadvantage and consequently affecting their quality of life. To this end, it is expedient that sustainable water project is embarked upon with a view to curtailing the attendant problem and meeting the sustainable development goal six**.**

Policy Recommendations

Sustainable water project should be embarked upon in the study area with a view to providing potable water for the coastal dwellers of Ondo State.

1. There should be establishment of desalination plants to convert seawater into freshwater for domestic use, drinking, industrial use, and agriculture. This will guarantee stable and sustainable potable water supply in the study area and this will consequently improve ease access to potable water and improve quality of life in the study area.
2. Watershed management policy and implementation strategy should be adopted for the study area. This strategy will assist to protecting and restoring watersheds to maintain water cycles and prevent pollution. Implementation of this strategy will promote sustainable groundwater management practices in the study area, thereby, improving quality of life.
3. Increase allocation of federal and state funds to addressing coastal areas numerous problems. Greater percentage of federal funds to be allocated to coastal infrastructure development.
4. Public-Private Partnerships (PPPs) should be encouraged in investment in infrastructure development in the coastal area of Ondo State with community-led initiatives and grassroots efforts to develop and maintain coastal infrastructure such as water provision.

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