



**Assessment of Residents Perception of Public Water Supply in Port Harcourt Municipality, Rivers State, Nigeria**

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**Abstract**

Water is one of the physiological needs and constitutes essential ingredient for the survival of man. It is for this reason that the provision of potable water is often the priority of government of any society as a way of promoting the overall wellbeing of residents. The present study examined the state of public water infrastructure in Port Harcourt Municipality with a view to examine residents' perception regarding public water supply in the city. The study leans on the constructivist research paradigm since it does not purport an object reality of the problem under investigation. The research design was the cross-sectional survey research design as the study sought to examine the perception of residents of Port Harcourt on the public provision of water as they exist without any recourse to their temporal dimension. The sample size comprises of 399 respondents who were randomly selected from five neighbourhoods in the study area. Our findings revealed that there is complete absence of public water supply within the Municipality. Further analysis revealed that public water supply was last witnessed between the year 1996 – 2000 while on the average residents spend seven thousand naira (N7,000) per month to meet their water needs. Among the major issues militating against public water supply were dilapidated water mains (16.8%), and unplanned urban growth (15.2%). In view of the importance of water to the socio-economic development of man, there is need for public water supply agencies in Port Harcourt to redouble their efforts in the provision of water to residence in the area. This is the only way public water supply in the municipality can meet the universal water access target by 2030.

**Keywords: Perception, public water supply, urban growth, water need, socio-economic development**

## 1. Introduction

One of the challenges facing urban dwellers especially those in developing countries of the world relates to the ability of municipal government to meet their water supply needs in the right quality and quantity. According to Mitrica, Mitrica, Enciu, and Mocanu, ( 2017), most developed and developing countries are at risk of severe water shortages in the 21st century if urgent steps are not taken. The problem of water supply is such a huge burden to the extent that about 1.1 billion people globally lack access to improve water supply (World Health Organization, 2019)

Public water supply is essential for sustainable city growth. Hall and Lobina (2006) opined that Public water supply accounts for 90% of water supply in middle and low-income countries and serves domestic, institutional, industrial and commercial functions while domestic water supply represents between 50–70% of public water supply (Ayanshola, Sule, & Salami, 2013; Lu & Smout, 2008).

Improvement in water supply contributes to health equity by reducing the link between poverty and disease (Bartram & Cairncross, 2010), prevents approximately 2.4 million deaths annually and averts approximately 7% of global burden of diseases and 19% of child mortality worldwide (Pruss-Ustun, Bos, Gore, & Bartram, 2008).

It is for this reason that goal 6 of the Sustainable Development Goals (SDGs) places much premium in ensuring availability and sustainable management of water for all and sees the attainment of Goal 6 as pre-condition for meeting the other Goals and targets of SDGs.

Granted, access to water is a universal and constitutionally guaranteed right and is a duty for government to provide potable water for its citizens. At a basic level, everyone needs access to potable water in adequate quantities for drinking, cooking, personal hygiene and sanitation facilities that does not compromise health. Yet the realization of access to public water sometimes is marred by institutional, political, and administrative bottlenecks.

Port Harcourt is the capital city of Rivers State whose population growth has been phenomenal over time with attendant demand placed on the public water infrastructure in the city. In the absence of efficient public water provision in Port Harcourt occasioned by non functional public water stations across the municipality, residents results to other means of water supply such as private boreholes, sachet water and bottle water for drinking and other domestic uses.

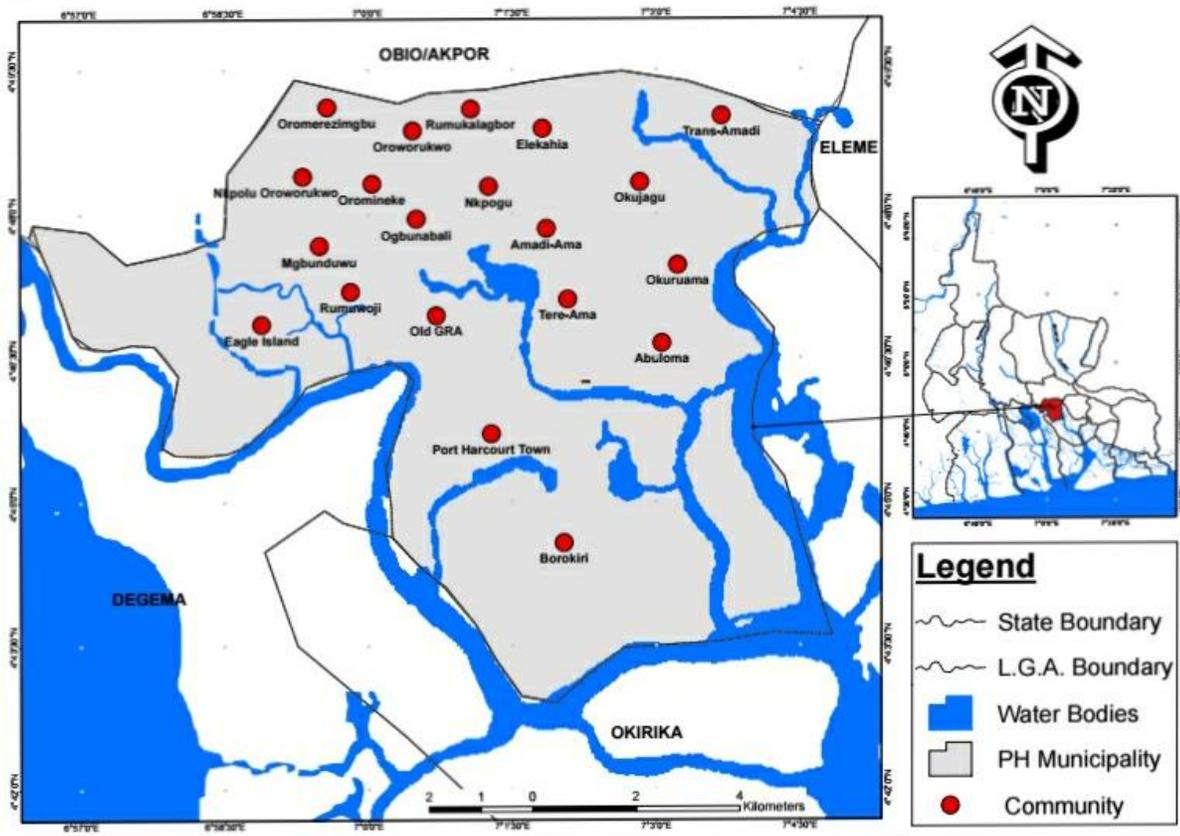
This phenomenon has led to the proliferation of all kinds of water vending enterprises most of which do not meet purification standard, thereby predisposing residents to water-related diseases

that threaten the health of the residents (Ukpaka and Ukpaka ,2016). The present study seeks to unravel the perception of residents on public water supply in Port Harcourt municipality.

## **2. Study Area**

Port Harcourt City Local Government Area is one of the area councils that make up the Port Harcourt Metropolis, and one of the twenty- three Local Government Areas (LGA) in Rivers State. It is an economic beehive (centre) in the Niger Delta area of Nigeria. The LGA covers a land area of 100km<sup>2</sup> and has its headquarters at Old Port Harcourt Township (Ajie & Dienne, 2014).Port Harcourt City Local Government Area is bounded by Obio/Akpor LGA to the North, Okrika LGA to the South (See Fig. 1). It is located within latitudes 4<sup>0</sup>5'11" and 5<sup>0</sup>15'45" North and longitudes 6<sup>0</sup>22'25" and 8<sup>0</sup>05'12" East (Ajie & Dienne, op cit).Although Port Harcourt City LGA is located in a tropical wet climate with lengthy and heavy rainy seasons, rain water is unwholesome for drinking due to the presence of industries emitting noxious oxides into the atmosphere.With a population of 546,789 Persons in 2006 (National Population Commission, NPC 2006), the projected population is expected to increase to 1,306,725 persons in 2020 using the population growth rate of 6.5%. Rapid population growth of the city also tasks the capacity of installed water infrastructure and government to meet the water needs of residents.

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**Fig 1. Port Harcourt municipality showing wards.**

Source: Department of Urban and Regional Planning, Rivers State University

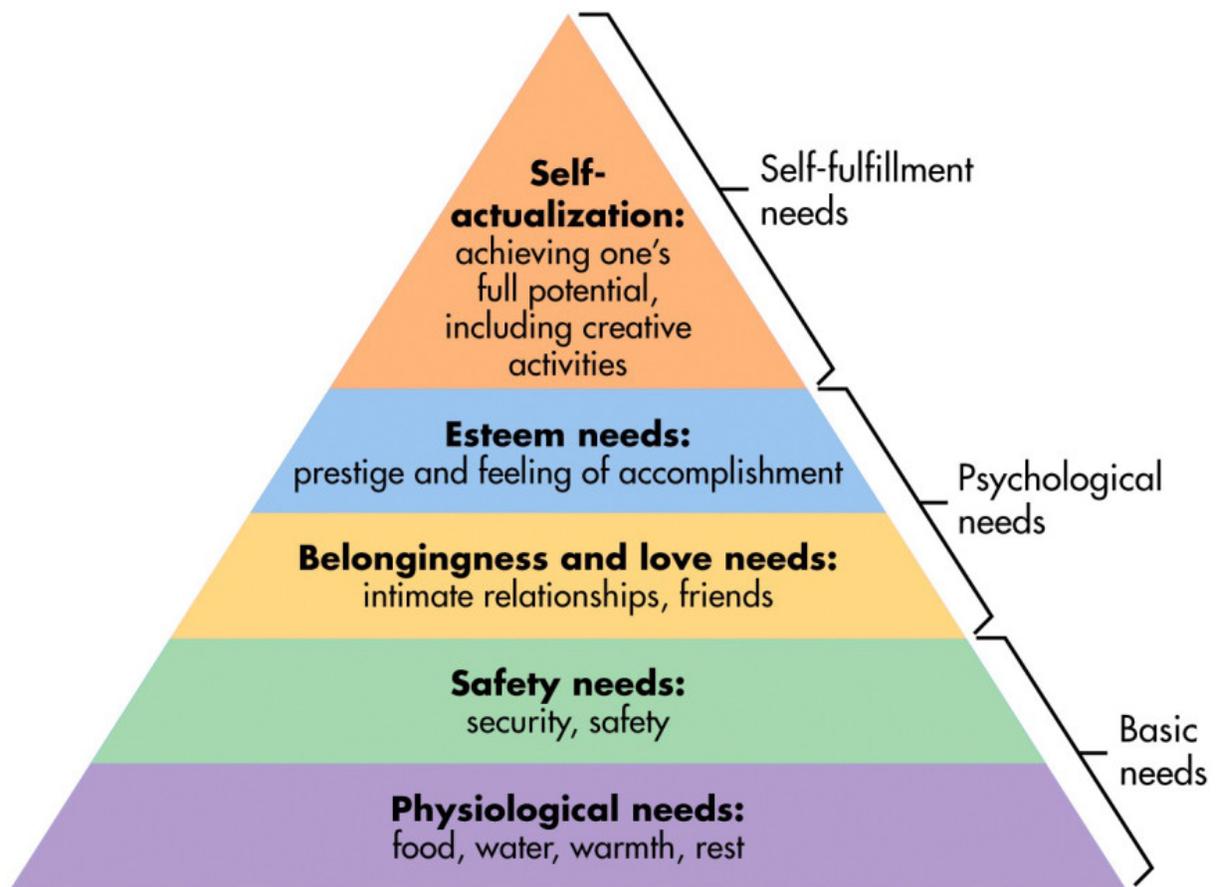
### 3. Theoretical orientation and Literature Review

#### 3.1. The Hierarchy of Needs Theory

The Hierarchy of Needs Theory was formulated by Abraham Maslow in 1943 and later redefined in 1954 (Corporate Finance Institute, nd). Maslow's hierarchy of needs provides that human needs are met in hierarchical order beginning with the most basic needs and culminating with the fifth level of needs-self –actualisation.

The first level of the hierarchy of the need theory is the physiological (figure 2). They are the most essential things a person needs to survive and they include need for shelter, water, food, warmth, rest and health. A person's motivation at this level derives from their instinct to survive.

According to McCaffery (1992), water is essential for the survival of human beings. It is imperative that as a physiological need, the provision of potable water should be the priority of government as it is vital form of basic need of any society and overall wellbeing of residents.



**Fig 2 Maslow's Hierarchy of Needs.**

Source: Maslow ( 1943)

## 2.2. The Theory of Public Goods

The theory of public goods was postulated by Paul Samuelson in 1954. He explained that goods that are collectively consumed are non-rival and non-excludable. According to Holcombe (1997), public goods constitute economic theory, which defines it as a good once produced and can be consumed at no additional cost. The provision of public goods to citizens or residents is a matter of welfare and equity since the goods are to be enjoyed and distributed to every member of the society, both the "Haves and Have nots". Safe water supply is a major consideration for human welfare and so cannot be left in the hands of individuals for its provision (Hjerppe, 1997).

On the basis of public health, water supply is regarded as a public good which requires government intervention through funding and policy regulation.

### **3.2. Empirical Review**

The issue of urban public water supply have indeed elicited lots of attention from scholars in literature. For example, Coetzee et al. (2016) conducted a study on assessment of perceptions, sources and uses of water among six African communities in northwest province of South Africa using a sequential explanatory mixed method design. The finding of the research was that 72.4% of respondents regarded their water quality as average and believed that water should be conserved and used sparingly. The study recommended practical implications for water management and development and implementation of water related interventions and projects in northwest province of South Africa.

On the daily water needs among residents, Idowu et.al. (2015) examined the public perception of public water supply in Abeokuta southwest Nigeria. The study observed that 65% of respondents used less than 120liters of water daily while 77% attested that the water supply did not meet their daily demand. The study recommended that, the issues of inadequate water supply and coverage area be addressed speedily and residents should subject water obtained from alternative sources to treatment.

Wami and Fisher (2015) carried out a survey on the effects of poor performances of water utilities in Port Harcourt City Nigeria. The study revealed that although most residence in the city depend solely on Rivers State Water Board (RSWB) to meet their water needs poor performance by RSWB creates situations where residents meet their water needs by patronizing informal vendors. The study recommends the continuous re formation the water sector to meet satisfaction and sustainability.

Wocha, Brown and Weje (2020) also looked out the challenges of private provision of potable water in Obio Akpor LGA and its socio-economic implication. Adopting a cross-sectional survey research design, the study revealed the proliferation of private boreholes and huge cost incurred by residents in trying to meet their water needs. The present study seeks to examine the state of public water infrastructure in port Harcourt municipality with a view to examine residents' perception regarding public water supply in the city.

### **4. Methods and Materials**

This study leans on the constructivist research paradigm since it does not purport an object reality of the problem under investigation. Accordingly, it adopts the qualitative research approach (Creswell & Creswell, 2017). The research design study adopted was the cross-sectional survey research design as the study sought to examine the perception of residents of

Port Harcourt on the public provision of water as they exist without any recourse to their temporal dimension. The study population comprises of residents in Port Harcourt municipality in the 20 wards. The sampled population comprised of 5 neighborhoods representing 25 percent of the entire population namely, Port Harcourt Main town, Oromenike and Miles 1,2,3. The sample population has a total population projection of 1,155,960 persons in 2020 against 186,124 persons in 1991 at 6.5 percent growth rate. With a household mean size of 6 (NPC,2006) and the total number of household size of 192,661. The sample size comprises of 399 respondents derived by employing the Taro Yamane formula. Table 1 shows the distribution of questionnaires selected in each neighborhood. The study adopted the simple random sampling techniques and questionnaires were administered to household heads and individuals above 18 years of age at the time of survey. Univariate analytical techniques used were mean, median and percentages. Data presentation was through the use of tables, figures and charts for easy understanding.

**Table 1: Population and Sample Size**

S/No.	Communities	1991 Census Population	Projected Population (2020)	Total Number of Households	Number of Questionnaire To administer
1	Main Town	12369	76,820	12,803	27
2	Oromineke Layout	21377	132,766	22,128	46
3	Nkpolu Oroworukwo Mile 3 Diobu	52613	326,764	54,461	113
4	Mgbundukwu (Mile2 Diobu)	55582	345,203	57,534	119
5	Rumuwoji (Mile1 Diobu)	44,183	274,407	45,735	95
	Total	186,124	1,155,960	192,661	399

## 5. Results and discussion

### Socio – Economic Characteristics of Respondents

Table 2 shows the socio-economic characteristics of respondents. The modal age bracket was “26 – 32 years”, accounting for 26.4% of the distribution. Following closely were the “18 – 25 years” and “33-40 years” age brackets, accounting for 24% and 22.9%, respectively. This implies that the respondents were adults qualified to participate in the survey. In terms of length of stay, respondents who had stayed for 5 years or less in the neighborhood comprised the highest proportion of 30.3%; those who had stayed for over 20 years accounted for 20.3% of the distribution. The educational attainment reveals that respondents that attended secondary/vocational level, accounted for 55.9% of the distribution, followed by Tertiary (39.8%).

**Table 2: Socio – Economic Characteristics of Respondents**

S/No	Age Bracket	Frequency	Percentage
1	18-25	87	24.0
2	26-32	96	26.4
3	33-40	8.	22.9
4	41-47	16	4.4
5	48-55	25	6.9
6	55 years and above	19	5.2
7.	Non-response	37	10.2
Total		363	100

#### Length of stay

S/N	years	frequency	Percentage
1	5 years or less	117	30.3
2.	6-10 years	57	20.1
3.	11-15 years	30	15.7
4.	16-20 years	42	11.6
5.	Over 20 years	72	19.8
6.	non-response	9	2.5
Total		363	100

#### Educational attainment

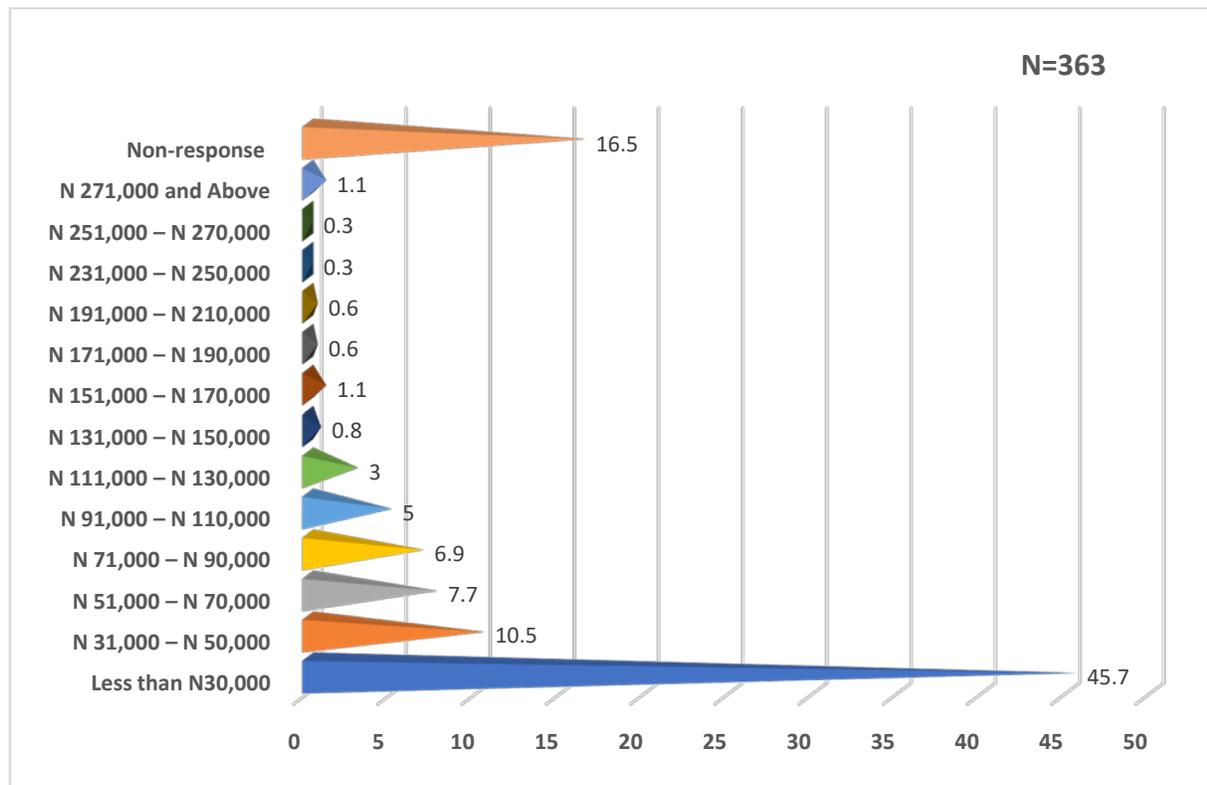
S/N	level	frequency	percentage
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1.No education	6	1.7
2.Primary	9	2.5
3. Secondary/Vocational	198	54.5
4. Tertiary	141	38.8
5. Non-response	9	2.5
Total	363	100

Source: Researcher’s Field Survey, (April 2021)

### Monthly Income

The monthly income of respondents (Figure 3) shows that the modal monthly income bracket of respondents was “Less than N30,000”, representing 54.8% of the distribution.



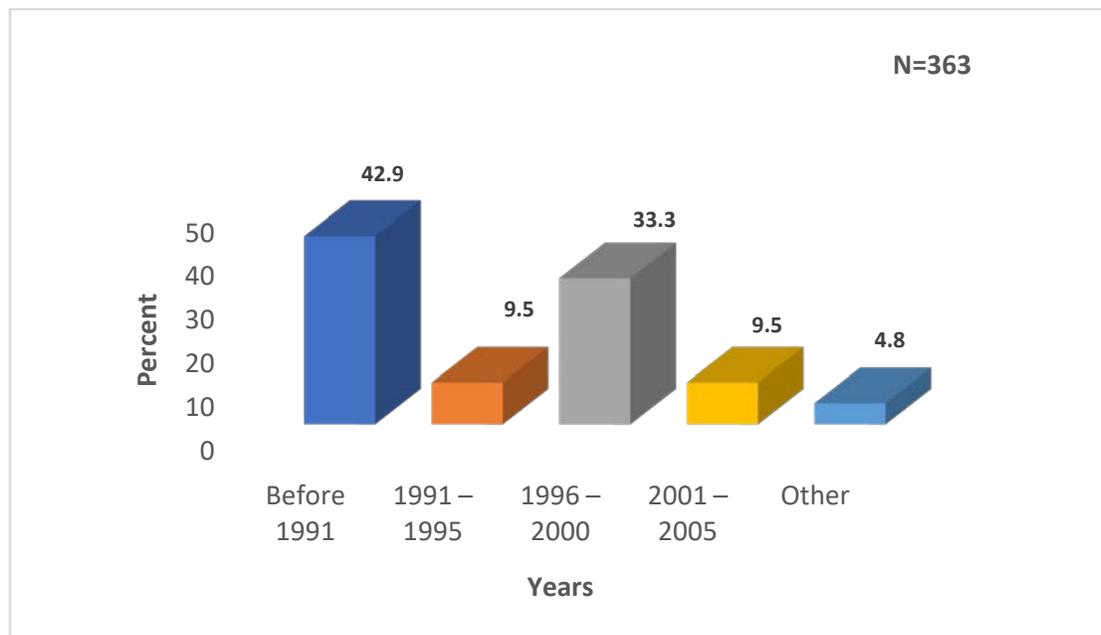
**Figure.3: Percentage Distribution of Monthly Income of Respondents**

Source: Researcher’s Field Survey, (April 2021)

### Piped Water Provision by Government

Respondents were asked if they had piped water provided by government. As shown in Fig 4.the overwhelming response was “No”, representing 97.5% of the distribution. The 2.5% that answered in the affirmative were asked to state the number of days they had water running, the modal response was 3 – 4 days a week (55.6%).

Furthermore, respondents were asked if they once had government water in the past. The modal response was “No”, accounting for 91.1%, while those who said “Yes”, accounted for 8.9% of the distribution. Those who said they once had government water supply were asked to state what period they had the supply, only 27 respondents answered this question. The modal response was “Before 1991” accounting for 42.9%, following next were those who said “1996-2000”, accounting for 33.3% (Fig. 4).

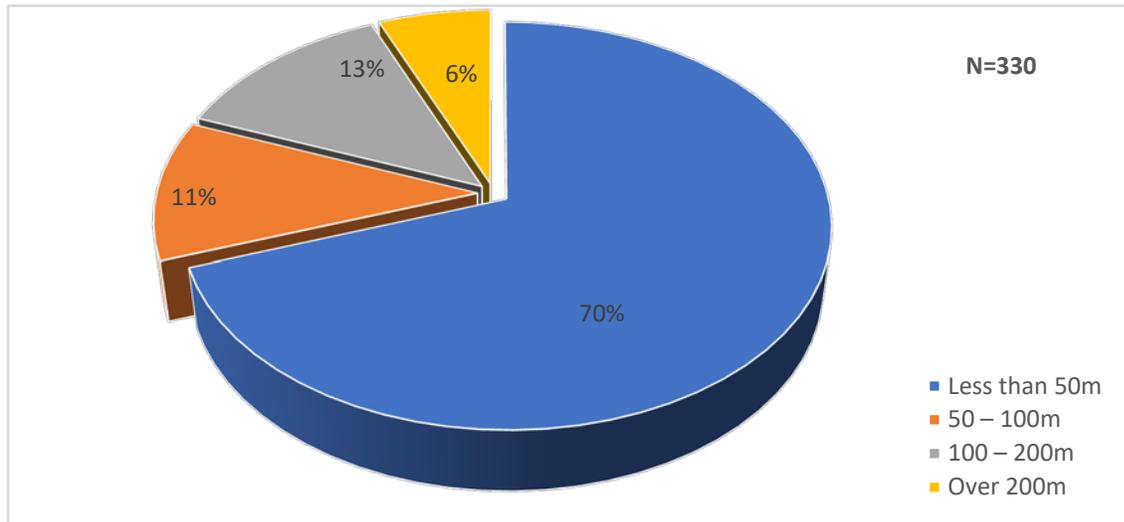


**Figure.4: Period of Public Water Supply as Reported by Respondents**  
 Source: Researcher’s Field Survey, (April 2021)

### Distance to Fetch Water

Figure 5 shows that most respondents reported the distance to where they fetched water to be “Less than 50 meters”, accounting for 70% of the distribution. This implies that they owned their private boreholes or got water around their premises. The average volume of water needed by households was 120 litres. Minimum and maximum quantity was 120 litres and 200 litres Cans respectively, as stated by the United Nations Organization.

Respondents were asked if they had sufficient water for their households. The modal response was “Yes”, accounting for 61.9%. Those who reported that they did not have sufficient water accounted for 38.1% of the distribution.



**Figure.5: Percentage Distribution of Distance to Water source**

Source: Researcher’s Field Survey, (April 2021)

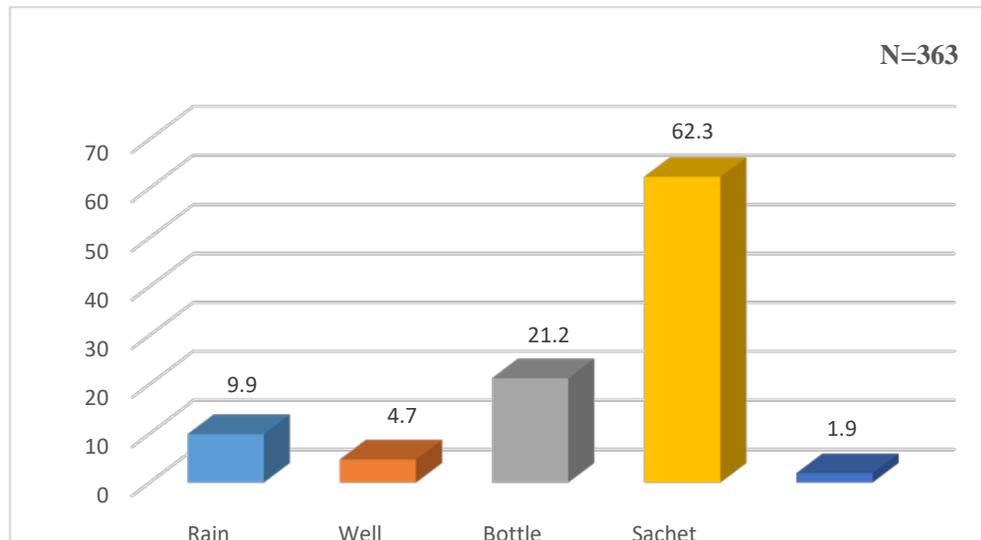
### Cost of Water Supply

On how much respondents spent on water supply from the year 2010 to 2020 the modal amount was ₦ 1,000 (42.9%), while the average expenditure on water across the locations was ₦ 1,857. The minimum and maximum were ₦ 500 and ₦ 7,000, respectively.

Respondents were also asked to state how much they spent on pumping water. The average cost was ₦ 5,776 per month. The modal expenditure on fuel was ₦ 1000 per month. Minimum was ₦ 1,000 and maximum was ₦ 70,000.

Alternative sources of water reported by respondents were Rain, Well, Bottle and Sachet, accounting for 10.1%, 4.8%, 21.6% and 63.5%, respectively (Fig.6).

Regarding affordability of water bills, most respondents (86.4%) said it was “Affordable”. Most respondents think there is problem with water supply across the study locations (73.9%).



**Fig.6: Percentage Distribution of Alternative Sources of Water**

Source: Researcher’s Field Survey,(April 2021)

**Perceived Causes of Water Problems in the Study Area**

Table 3 presents the perceived causes of water problems in the neighbourhoods. “Dilapidated water mains” was identified as a major cause (16.8%),” Unplanned township/neighbourhood” was also identified as a major cause (15.2%) and “Frequent breakdown of pipelines” (8.3%).

**Table 3: Causes of Water Problems in the Study Areas.**

S/No.	Cause	Major Cause	Minor Cause	Not a cause	Don’t Know	Non-response	Total
1	Government unwillingness (N=363)	11.0	6.1	12.7	10.7	59.5	100
2	Lack of technical expertise to handle pump (N=363)	5.5	11.8	6.9	7.7	68.0	100
3	Frequent breakdown of pipe lines (N=363)	8.3	7.2	5.0	9.1	70.0	100
4	Dilapidated water mains (N=363)	16.8	10.5	6.3	8.8	57.6	100
5	Unplanned township/community	15.2	6.1	6.6	10.2	62.0	100
6	Others	15.2	3.0	0	1.4	80.4	100

Source: Researcher’s Field Survey (April, 2021)

### Suggestions for Improving Water Supply in the City

Respondents were asked to suggest ways of improving potable water supply in the state. The modal response was “Adequate Planning to provide water reticulation for the city”, accounting for 22.9% of respondents. “Provision of electricity” and “Government should provide boreholes”, accounted for 15.7% and 12.1%, respectively (See Table 4).

There was no presence of government overhead tanks in the Oromenike neighbourhood as observed by the Researcher.

**Table 4: Suggestions to Improve Water Supply**

S/No.	Suggestion	N	%
1	Government should provide neighbourhood water scheme	8	2.2
2	Constant power supply	21	5.8
3	Government should provide boreholes	44	12.1
4	Adequate planning to provide water reticulation for the City	83	22.9
5	Provision of electricity	57	15.7
6	Non-response	150	58.7
	Total	363	100

Source: Researcher’s Field Survey, (April 2021)

### 6. Conclusion and Recommendation

Although WHO’s (2019) report indicates that 1.8 billion people have gained access to basic drinking water services since 2000, the report also indicated vast inequalities in the accessibility, availability and quality of these services in most countries of the world as greater percentage of people around the world continues to suffer from poor access to water, sanitation and hygiene. Poor access and inequality to water appears to be more precarious in most urban centers in the developing nations of the world.

Port Harcourt the capital city of Rivers state, Nigeria has and is still witnessing rapid population and urban expansion occasion by influx of firm and people into the area. Increased human population is accompanied by high demand for water to meet diverse human needs thus exacting more pressure on the ability of public water agencies to meet the overwhelming water needs of the populace.

Public water provision by public agencies in Port Harcourt is marred by factors such as political unwillingness/ adequate funding, ruptured water pipes, haphazard urban growth and encroachment of development on water pipeline right of way (ROW) amongst others.

In view of the importance of water to the socio-economic development of man, there is need for public water supply agencies in Port Harcourt to redouble their efforts in the provision of water to the residence in the area. This is the only the water supply in the municipality can meet the universal water access target by 2030

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