WATER SCARCITY IN THE MIDST OF WATER: CHALLENGES AND PROSPECTS OF DOMESTIC WATER SUPPLY IN ASABA AND ENVIRONS

By

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Abstract

The study examines issues of water scarcity in Asaba, despite the abundance of water resources in the area. It investigates the cause-and-effect relationship through mixed-method approach using surveys, interviews of respondents and observational methods for data collection and analysis. The results showed that, the failure of government, institutions variability of climate, poor potable water and inaccessibility to sources of these water are key drivers of water scarcity in the area; thus, negatively affecting vulnerable population of Asaba, such as the low-income group, children, women and the rural communities, who travel long distances in search of potable water for domestic and other uses. The study recommends the need to address the failures on the part of government in. providing potable water for the people, good governance, equitable distribution of water through government owned -pipe-borne water, thus arresting water scarcity in Asaba. The study therefore is of importance to the discourse on water resource management and sustainable development for policymakers and all stark holder concerned with the management of water, today future generations to ensure reliable access to potable water in Asaba and environs.

Keywords: Water, Scarcity, Asaba, Potable, development Reliability, Sustainable

1.0 Introduction

The availability of potable water for domestic and other uses is one of the greatest issues facing mankind today - in some ways the greatest, because problems associated with water affect the lives of millions of people on the earth's surface (Mishra, 2023; Ushurhe et al., 2023). It has consequently attracted a wide scale international attention of United Nations agencies and related international and regional governmental and non- non-governmental organisations (Connor, 2015). The rapid growth of population coupled with steady increase in water requirements for domestic, agricultural and industrial development have imposed stress on the available freshwater resources in terms of both the quantity and quality, requiring consistent and careful assessment and management of surface and ground water for sustainable development (Sophocleous, 2004; Famous, 2024).

The importance of water for socio-economic development is well recognized the world over. But, with increasing population and industrialization and their demands for water for various uses, water scarcity is looming in most cities of the world (Israilova et al., 2023). In Asaba, and environs, water scarcity is characterized by population growth, climate change, poor water management practices and contamination of water courses, thus hampers development through constraining food production, health and industrial development.

The problem of water scarcity water scarcity in Asaba is a delicate issue. This can be attributed to poor management of water resources; increase in population, climate change, high evapotranspiration, poor agricultural practices and government failure is the management of water

resources (Akpovi, 2021). The increase in world population has led to increase in the demand for water, thus putting pressure on the available water resources (Fischer & Heilig, 1997).

The change in weather events affect the amount of rainfall and its availability. Asaba and environs are particularly vulnerable to climate change, which has led to flooding in many parts of Asaba and unpredictable precipitation patterns (Azagbaesuweli et al., 2025). This variability complicates water availability and makes it difficult for communities to access portable water m the midst of abundant water. Furthermore, poor water management practices coupled with inadequate systems in planning and regulating water usage, including inefficient allocation of resources, poor infrastructure, further exacerbate the scarcity of water in Asaba (Ushurhe et al., 2024a). Associated with the above, is the contamination of water courses from industrial discharges, agricultural run-off and untreated sewage, which find their way into water bodies. resulting in harmful pollutants in surface and underground water (Ushurhe et al., 2024b). There is therefore the need to assess the challenges and prospects of domestic water supply in Asaba and environs, in the midst of abundant water for today and future generations.
abundant

Asaba and its environs is served by rivers, streams and other water courses. Despite all these water resources, Asaba still suffers from the scarcity of potable water for domestic uses. The scarcity of water poses a threat to the live for the people and a challenge to their health and wellbeing thus retarding economic productivity and quality of life of the people. Lack of adequate infrastructure including treatment plants, storage tanks and pipelines for distribution hinders effective access of their resources to the people in spite of the availability of the river Niger at their doorstep (Ushurhe et al., 2024c).

Thus, there is the need to tackle this systemic failure through a comprehensive, integrated and sustainable approach, hence this research. In doing this, issues of water scarcity will be history in the area, thus enhancing equitable domestic water supply for the people of Asaba and environs. Therefore, the main purpose of the study is to examine the challenges and prospects of domestic water supply in Asaba in the midst of scarcity: Arising from the above, the following objectives suffices:

1. Assess the supply, management and service delivery of domestic water in Asaba and environs.
2. Ascertain the problems and challenges affecting the provision of potable and safe domestic water in the area.
3. Examine the effect of water scarcity on the lives of the people, such as health and socio-economic activities of the people in Asaba and environs.
4. Provide innovative solutions and technologies including management practices for improving domestic water supply in Asaba and environs.
5. Suggest practical recommendations for policy makers, water resource managers and stakeholders to ensuring sustainable domestic water supply in Asaba and environs.

2.0. Theoretical Framework

The study of water scarcity in Asaba in the midst of abundant water resources is hinged four interconnected theoretical frameworks, which collectively show the interplay of socio-economic, institutional and environmental factors revolving on water scarcity in the area.

2.1. Sustainable livelihoods Framework

This framework was developed in the Department for International Development (DFID, 2001) and emphasizes the dependence on five capitals.

1. The underutilization of natural resources such as rivers, rainfall and aquifers, due to poor infrastructure and climate change.
2. Hinderance of to water accessibility due to poor management of resources such as decaying pipelines, poor treatment plants and poor electricity supply.
3. Community cooperation and gender inequality in the search for potable water
4. Financial wellbeing in the search for water and alternative sources such as poverty and bottle water
5. The health status of the people, low education and water-borne diseases reduces productivity.

Thus, the scarcity of water in Asaba reflects the mismanagement of natural resources, and poor investment in human and physical capital, this retarding domestic water supply in the area.

2.2. Institutionalism

Douglass North's Institutionalism (1990) argues that formal and informal institutions shape human behaviour. Thus, in Asaba, weak formal Institutions such as the Delta State Water Supply Agencies' inefficiency, corruption and lack accountability are hindering the free flow of water in the area. Furthermore, informal norms such as bribery for connections and political interference coupled with historical underinvestment and mismanagement perpetuates crises in the water sector.

2.3. Environmental Justice

Environmental justice posits that marginalized groups bear disproportionate environmental burden (Peet & Watts, 2004). Thus, spatial inequality such as rural area accessibility to water and urban areas accessibility, gender impacts involving women walking 1 - 3 kilometres daily search of water and girls being absent from school during water shortages, including climate injustice, such as flood prone areas and pollution from industrial effluents, open defecation contaminate rivers and groundwater:

2.4. Intersectionality

Crenshaw (1989) examines how overlapping identities such as class, gender, location, compound disadvantage in the quest for domestic water supply. Poor women in rural areas fetch water from distant places, lack sanitation and earn little income from informal labour, including youth unemployment pour cultural practices contributes negatively to potable water availability.

Thus, the four frameworks converge on systematic failures, resource mismanagement, governance gaps, inequitable table distribution of resources and overlapping disadvantages in water resources distribution.

3.0. Materials and Methods

3.1. Study Area

Asaba is located within latitudes 6°20′ North and 6°18′ North of the Equator and longitudes 6" 73" East and 6° 75° East of the Greenwich Meridian (Figure 1).

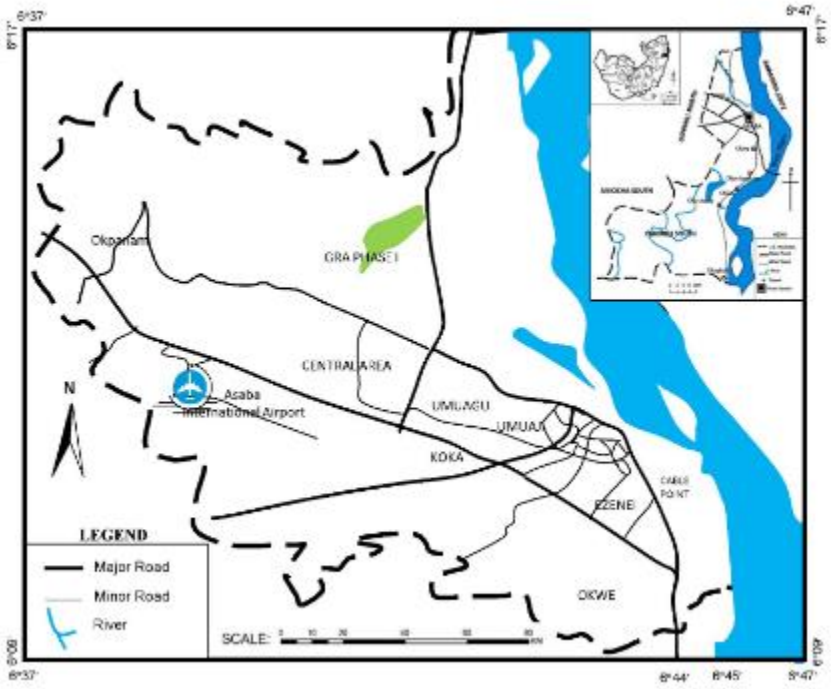

Figure 1: Map of Asaba showing water resources
Source: Adapted from Ministry of Land, Survey and Urban Development (2022)

Asaba is the capital city of Delta State of Nigeria, and is bounded in the west by River Niger, m, the north by Anambra state, east by Oshimili North Local Government Area and in the south by Oshimili South Local Government Area.

Asaba is situated in the Niger Delta region of Southern Nigeria, underlained by sedimentary rocks, made up of sand, silt and clay deposited during the tertiary and quaternary periods (Reyment, 1965, Short & Stauble, 1967). The relief and drainage of the area is one of low-lying plains, meandering rivers, streams and Swampy terrain. The area is drained by the River Niger and its tributaries, Anambra River and streams such as the Oshimili stream and Anwai creek.

The area is characterized by high temperatures and high levels of humidity throughout the year. The mean daily maximum temperature is about 32°C. Rainfall, intensity ranges between 2500 mm to 3000 mm (Ajayi, 2003). The hydrogeological context of the area is characterized by

an unconfined aquifer, which is recharged by rainfall and river water (Oladapo, Ojo & Adesina, 2015). The groundwater in the area is influenced by the River Niger and its tributaries that cut across the region; thus, serves as a major source of surface water in the area

3.2. Method

The study employed a mixed-method approach in this study on water scarcity in Asaba in the midst of abundance. The research made use of quantitative data and qualitative method in analysing socio-economic, infrastructural and environmental factors influencing water supply in the area.. Thus, the sustainable livelihood Framework and Integrated Water Resources. Management framework provided a holistic understand of the issue under investigation.

The causes, impacts and management of water scarcity in Asaba was carried out using the mixed-method approach. Quantitative surveys, qualitative interviews, focus group discussion and direct observations were used to gather empirical data for the study as discussed.

4.0. Data Presentation

A structured survey of 300 households in Asaba and environs were assessed for domestic water availability and usage. Data were collected using Kobo Tool box and analyzed using SPSS v 25. The data is presented and discussed.

Table 1: Demographic Profile of Respondents

Variable	Category	Frequency
Gender	Male	168
	Female	132
Total		300
Income Group	Low	120
	Middle	120
	High	60
Total		300
Location	Urban	150
	Peri-Urban	90
	Rural	60
Total		300
Household Size	1- 4	90
	5 – 8	150
	8	60
Total		300

Source: Field work, 2025

Table 2: Showing Water Sources and Accessibility of Respondents to Domestic Water Supply

Primary Source	Frequency	Percentage (%)
Piped/Tap	90	30
Borehole	120	40
Sachet Water	60	20
River/Stream	80	10

Source: Field work, 2025

Table 3: Showing Accessibility Frequency

Variable	Percentage (%)
Daily	40
2-3 Weeks	30
Weekly	20
Rarely	10
Total	100

Source: Field work, 2025

Table 4: Distance to Sources of Water Supply

Variable	Percentage (%)
< 100m	20
100 – 500m	50
> 500m	30
Total	100

Source: Field work, 2025

Table 5: Showing Perceived Water Quality and Health Crises

Perceived Quality	Frequency	Percentage (%)
Good	90	30
Fair	120	40
Poor	90	30
Total	300	100

Source: Field work, 2025

Table 6: Respondents on Waterborne Diseases

Variable	Percentages (%)
Yes	40
No	55
Undecided	5
Total	100

Source: Field work, 2025

Table 7: Treatment Methods Applied by Respondents

Variable	Percentages (%)
Boiling	50
Filtration	20
None	30
Total	100

Source: Field work, 2025

Table 8: Respondents Affordability to Domestic Water Supply

Monthly Cost (₦)	Percentage (%)
< 1000	40
1000 – 3000	40
➢ 3000	20
Total	100

Source: Field work, 2025

Table 9: Respondents Coping Mechanisms to Domestic Water Supply

Variable	Percentages (%)
Reduce Useage	50
Buy Sachet Water	30
Harvest Rain water	20
Total	100

Source: Field work, 2025

Table 10: Respondents view on water supplied by the Delta State Water Agency

Variable	Percentages (%)
Satisfied	20
Neutral	40
Dissatisfied	40
Total	100

Source: Field work, 2025

Table 11: Showing Interruptions to Water Supply

Variable	Percentages (%)
Daily	30
Weekly	50
Monthly	20
Total	100

Source: Field work, 2025

Table 12: Respondents Assessment of Corruption Leading to Water Scarcity

Variable	Percentages (%)
Bribery for connection	35
Leakage ignored	45
Lack of materials	20
total	100

Source: Field work, 2025

5.0. Discussion of Results

The problem of water scarcity in Asaba and environs reflects failure of government institutions, infrastructural decay and poor water distribution. Despite the abundance of underground and surface resources in the area, the people of Asaba still suffer from domestic water scarcity. Findings from household surveys attest to this, including existing literature highlighting inequality in income and climate change as key drivers of this scarcity.

In Table 2, 70 percent of the households rely on water from on pipe borne boreholes and sachet water. Those that depend on pipe borne water were 30 percent, 40 percent on borehole, while sachet water was 20 percent. 10 percent depend on water from streams and rivers. Thus, urban areas have access to pipe borne water, while the rural areas are deprived of pipe bore water. This assertion is in line with Amartya Sen's concept of development (2000) where minimalized groups are denied access to essential services. In table 1, gender disparities showed that women are primary water fetchers and spend most of their time in search of water, thus affecting their education, and economic opportunities (UNDP, 2015). In a related development, studies by Adeniyi-Oloukoi (2013) affirmed urban bias in resource allocator, thus negatively affecting the rural poor.

In order to access potable water, over 60 percent of households spend between ₦1000 - ₦3000 monthly water (Table 8). This has forced 80 percent of the households to adopt cost-saving measures (Table 9). This has made profit driven measure rather them a public good (Bakker, 2007). The inefficiency of government owned am supply water system has made, people to rely on unregulated vendors who sell water at a very high cost to them, thus deepening inequality among the populace.

Thus, 80 percent of the respondents (Table 10) are not satisfied with the water supplied by the Delta State Government as a result of bribery (35%), leaks (4.5%) (Table (2). These challenges can be attributed to underfunding, lack of transparency, and poor governance. This is evidenced by the world bank report on poor water service delivery (2018). Also Peet and Watts (2004) attributed this to seasonal shortages and untreated water usage.

Therefore, in the absence of potable, 45 percent of the respondents reported water borne diseases (Table 6) which is linked to poor access and untreated water. WHO (2010) identified water as a social determinant of health, hence potable is ideal for good health.

6.0. Conclusion and recommendations

Asaba and its environs is blessed with abundant Water resources, such as rivers, streams and aquifers, yet scarce in water supply for domestic uses. The following findings emerged from the study:

The study discovered that majority of the households rely non-piped sources (70%) such as boreholes, sachet water and river water for their domestic user. Rural areas (20%) and low-income households (40%) are mostly affected. This group of households have limited access to safe and potable water. In terms of water collections, women and girls travel long distances to fetch water, spending most of their time in searching for water.

The study also discovered that 30 percent of the respondent reported poor water quality with 45 percent been affected by waterborne diseases Industrial effluents, and poor sanitation are major factors responsible for this poor water quality. Thus, lack of adequate water treatment, and poor infrastructure further exacerbate the issue, posing health risks to the people.

Findings also emerged citing corruption (80%), mismanagement and inadequate infrastructure as major cause of poor water supply in the area. This has led to lack of trust and confidence in providing safe, reliable and potable water for the people.

The study equally discovered that flooding, pollution and seasonal shortages are responsible for water scarcity is Ababa. Thus, the impact of climate change on sources of water is a pressing issue, accounting for seasonal shortages and shortfalls in water supply in the area.

Discovery from the study further showed that water scarcity has significant socio-economic implications on the lives of the people. Sixty percent of the households spend as much as ₦1000 - ₦3000 per month on sachet water. This expenditure falls mostly on low-income people, thus exacerbating poverty and inequality. The equally impact negatively on the health, education and livelihoods of the low-income group is the area.

Finally, the findings are grounded in the four theoretical frameworks as enumerated above, which collectively highlights the complex interplay between socio-economic, Institutional and environmental factors driving water resources in Asaba and environs Conclusion problem

The problem of water scarcity in Asaba is a pressing issue that requires immediate attention. Despite the abundance of water resources, residents in Asaba face acute water scarcity, poor water quality and inadequate access to reliable water. The findings of this research shows the complex interplay of socio-economic institution and environmental factors diving this short-falls in water supply.

Thus, there is need to reform the Delta State water Agency by investing in green infrastructure and promoting climate friendly infrastructure. The prospects for promoting good substance for community engagement through innovative financing and supporting is deal towards sustainable water supply

Stakeholders, policymakers and government agencies including the private sector should work together to address issues of water scarcity in Asaba. By adopting holistic approach, the residents of Asaba can overcome the challenges of water scarcity and achieve a better future for the citizens

Based on the findings of this study, the following recommendations are made:

1. There should be improved service delivery in water supply through community participations, decentralization and increased transparency.
2. There should be an upgrade of infrastructure, fix leaks and expand coverage of water supply to the people of the area.
3. There should be promotion of rainwater harvesting through household encouragement to reduce reliance on water supply from the Delta state government
4. Government should invest in green energy infrastructure in order to solve issue of poor water quality.
5. There should be regular water quality monitoring. Surface water should be tested regularly to ensure safety of the water consumed by residents.
6. Communities should be supported in water-led management initiatives in order to address issues of water pollution and contamination.
7. Public awareness campaign be embarked upon to educate the populace on the need to maintain and safeguard the sources of water supply, such as rivers and streams.
8. Institutions should be strengthened, especially those concerned with water supply, capacity building to ensure effective water governance.
9. In terms of water supply, there should be public- private partnership in order to leverage resource and expertise.
10. Monitoring and evaluations of water resources be carried out from time to time to address impacts and track progress made in water supply to residents and communities in the area.

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