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An Evaluation of Water Accessibility by Inhabitants of Awka Metropolis of Anambra State, Nigeria

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Abstract:

Water is a major source of life. However, people have been diagnosed of various waterborne related diseases due to lack of or low access to potable drinking water in their area of residence. Studies abound that looked into provision of drinkable water, but none to my knowledge has looked into water accessibility in Anambra State hitherto. To cover this gap, this study looks at water provision in the various neighbourhoods of Awka, the capital city of Anambra State of Nigeria. The aim is to evaluate the level of water accessibility in line with the globally recommended best practices, and also in line with sixth target of the Sustainable Development Goals (SDGs). The objectives of the study are fivefold:(a) ascertain the sources of water available to the residents of the various neighbourhoods; (b) determine the time in minute spent by the residents of the various neighbourhoods to access water from a facility; (c) ascertain the distance travelled by the residents of the various neighbourhoods to fetch water at the nearest facility, (d) ascertain the quantity of water consumed by the residents of the various neighbourhoods of the study area; and (e) recommend institutional arrangement needed to improve water supply in the study area. The methodology adopted to achieve the stated objectives was the administration of questionnaires to 10% of the households in 10 neighbourhoods chosen from both formal and informal settlements. In all, 533 households were sampled. The data obtained were analysed using tables, percentages and charts. The results of the variables examined showed a remarkable improvement in water provision within the city as over 80% of the respondents reported sourcing water from sources considered to be safe. The result also showed that the residents have good collection time as 90% reported collecting water within the globally recommended timeline. On distance travelled to collect water and the quantity of water consumed per capita per day, the result showed that 96% of the respondents travelled less than one kilometre, which is globally acceptable, to access water, while 92% of the respondents reported consuming water at the level of service considered to be safe. Overall, the study holds that water accessibility in the neighbourhoods of the study area is in line with what the WHO (2003) considers to be good access. The study discovers that the various player (mainly non-sate actors) who contribute to water provision in the city lack coordination as the state water board whose duty it is to provide the roadmap at policy and operational levels appears not to be living up to its responsibility.

Keywords: Water, Access, Climate, Temperature, Vegetation, Sustainable Development Goals (SDGs)

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1.1 Background to the study

Un Habitat (2003) observes that the supply of clean water is absolutely necessary for life, health and general well-being of man, and yet almost 2 billion people worldwide lack access to adequate water supply.

Globally, access to water can be categorized into four levels of supply, namely: no access, basic access, intermediate access and optimal access (WHO 2003). Under the no access level of water supply, quantity of water consumed is below five litres per capita per day and the distance travelled to collect water is more than 1000m or 30 minutes total collection time. On the basic access level, the quantity of water consumed should not exceed 20l/c/d and the distance is between 100 and 1000m or 5 to 30 minutes total collection time. The third level, which is the intermediate access, entails that the quantity of water consumed should not exceed 50l/c/d and water delivered through one tap on-plot or within 100m of 5 minutes total collection time. While the optimal access level emphasizes that the quantity of water consumed should be 100l/c/d and supplied through multiple taps continuously to the household.

According to WHO (2008), almost half of the urban population in Nigeria suffer from at least one disease attributable to lack of safe water and adequate sanitation. Contaminated water spreads diarrhea, typhoid fever, cholera/water borne worm infections and other diseases. Lack of water creates difficulties in carrying out basic hygiene around the house. In addition, lack of convenient access to drinking water means that many hours each day may be wasted on carrying water from distant sources, especially by women and girls.

Access to potable drinking water is posing a serious challenge for the inhabitants of Third World cities especially those living in the informal settlements. Water is an important resource that plays a vital role in the existence of human being as it helps in the effective functioning of human metabolic system. This is due to the fact that it is a basic necessity for humans and non-substitutable resource on which the health of ecosystems depends (Gupta, 2004).

Accessibility to safe drinking water therefore, is of fundamental significance to lowering the faecal risk and frequency of associated diseases and its association with other socioeconomic characteristics like education, income, household size makes it a good universal indicator of human development. When broken down by neighbourhood, social or demographic or economic criteria, it provides useful data on inequity. It has close links to other water indicators such as time, distance, quantity consumed and quality (WHO, 1996).

Against the backdrop of the above, the paper examines water provision in the various neighbourhoods of Awka, the capital city of Anambra state of Nigeria with a view to ascertaining whether the inhabitants of the capital city have access to water in line with international standards for access to such vital commodity.

1.2 The Statement of the problem

Anambra State is one of the most densely populated states in Nigeria with a density of 869 persons per square kilometre and a total population of 4,182,032. The population growth rate of 2.99%/year is also very rapid and the land area is just 4,815 square kilometre (National Population Commission, 2006).

This rapid increase puts serious pressure on available resources and facilities. As a consequence of the rapid urbanization process in Anambra state, the provision of critical infrastructure such as good road network, electricity, stable water supply and such other things that add value to human life becomes a herculean task.

The reasons for the rapid urbanization of Awka relate to its current status as the capital of Anambra state. Prior to the creation of Anambra state, Awka was a zonal headquarters with skeletal civil service activities and institutions of higher learning dominated the landscape. Before the creation of Anambra state, the town had played different roles as administrative/zonal headquarters at different times. In these roles, the city had remained more rural than urban in scope and essence. This had to change as soon as it became a state capital.

However, with the creation of Anambra state in August 1991 with Awka as its capital, the status of the town changed with civil servants who were hitherto living in Enugu, which was the capital of old Anambra state now residing in the new state capital.

The influx of population made up mainly of returnee civil servants from Enugu, employees of federal ministries and parastatals as well as student population of Nnamdi Azikiwe University and others have brought about tremendous pressure on existing infrastructure and services.

People from the various local governments in the new state started trooping to Awka in search of greener pasture. There is equally natural increase in population and urban-urban migration of people from different cities across Nigeria. This rapid population growth has led to serious pressure on the available basic amenities, prominent among which is water supply.

As population of the city continues to grow rapidly, more pressure is placed on the available water sources thus making water a scarce commodity and this necessitated this study.

Access to water which is defined by WHO/UNICEF(2000) as "the availability of 20litres per capita per day at a distance no longer than 1000metres," appears to be a mirage to the inhabitants of the capital city.

1.3 Aim and objectives of the study

1.3.1 Aim of the study

The study is carried out to evaluate the level of water provision in the capital city of Anambra State. This is with a view to ascertaining whether the residents of the neighbourhoods of the city enjoy water supply at the basic access level, which the World Health Organization (2003) established as the minimum threshold which citizens of any nation can attain to be classified as having improved access to water supply. This "basic service level" is also the primary objective of the Sustainable Development Goals target 6, which aims at ensuring improved access to water supply by the year 2030.

1.3.2 Objectives of the study:

The major objective of the study is to determine the current level of water provision in Awka, Anambra State, while the specific objectives are:

a.ascertain the sources of water available to the residents of the various neighbourhoods of city;

b.determine the time in minute spent by the residents of the various neighbourhoods of the city to access water from a facility;

c. ascertain the distance travelled by the residents of the various neighbourhoods of the city to fetch water at the nearest facility;

d.ascertain the quantity of water consumed by the residents of the various neighbourhoods of the city; and

e. recommend institutional arrangement needed to improve water supply in the study area.

1 .4 Research questions

Four pertinent questions relating to water accessibility are formulated to guide the study. They include:

1. What are the sources of water available to the residents of the different neighbourhoods in Awka?

2. What is the time spent to source water at the nearest facility by the residents of the various neighbourhoods in Awka?

3. What is the distance travelled to source water at the nearest facility by the residents of the different neighbourhoods in Awka?

4. What is the quantity of water consumed per capita per day by the residents of the different neighbourhoods in Awka?

2. Brief literature review

A review of literature both locally and universally reveals wide variation of what constitutes the definition of access to water.

There appears to be no universal consensus on what constitutes access to water and sanitation. To some authors, access to safe water is measured by the proportion of population with access to an adequate amount of safe drinking water located within a convenient distance from the users' dwelling.

The most frequently used definition is that of the United Nations Development Programme, UNDP (2002) which states that those with access comprise: "The proportion of the population using any piped water, public tap, borehole with pump, protected well and springs or rainwater". The World Bank (1997) provides various definitions dependent on the type of residential area being assessed: "In urban areas such a source (of safe water) may be a public fountain or standpoint located not more than 200metres away and in rural areas, access implies that members of the household do not have to spend a disproportionate part of the day fetching water". However, there appears to be no global consensus on the criteria used to calculate "the proportion of population with access" or what constitutes "a disproportionate part of the day fetching water".

In their Global Water Supply and Sanitation Assessment 2000 Report, WHO, UNICEF and the Water Supply and Sanitation Collaborative Council do not provide clear definition of what level constitutes access. This goes to point to the fact that there is no internationally standardized clear definition of access to safe water, thereby making meaningful comparisons between countries difficult.

The Global Water Supply and Sanitation Assessment Report (2000) which is based upon national estimates of the rural and urban households says reasonable access to improved water supplies means that at least 20litres of water per person per day are available from a piped water connection, public standpipe, borehole, protected dug well, protected spring or rain water collection within a distance of one kilometre from home.

What is noticeable, however is that definition of access varies from country to country depending on the level of urbanization. Even within a country what is obtainable in one city may not be feasible in another city as the level of urban growth can never be the same.

Access to water is further defined by the World Health Organization as "the availability of 20litres per capita per day at a distance no longer than 1,000metres" (WHO/UNICEF, 2000).

From WHO's definition, various countries adopt their own definition. Manda (2009), for instance, cited (MIWD, 2006) as having defined access to safe water for Malawi as "the number of people with minimum quantity of 27litres of potable water per capita per day obtained within a maximum one-way walking distance of 500metres. He defines potable water as "water safe from disease causing organisms, dangerous chemicals or objectionable colour or odour."

At the country level, several governments modify the definitions provided by the UNDP and the World Bank to apply to their population.

In their study of water security of three cities in the arid Americas (Hermosillo, Mexico; Mendoza, Argentina; and Tucson, USA), Diaz-Caravantes et al (2020) used the urban water security framework to examine five domains of water management: socio-demographic, economic, technological, ecological and governance (SETEG). Their analysis indicates that, in spite of water scarcity, urban growth has been promoted in the three cities. They argue that this expansion, although encouraged for economic development, is not sustainable in the long term. They opined that groundwater plays a major role in water supply in the three cities, but growth has negatively affected riparian ecosystems, the health of the aquifers and access to domestic water. In order to pursue water scarcity, the paper recommends among other things, the reduction of urban growth as a way of improving access to water.

In a related study, Nastiti et al (2017) explore the daily risks of households with respect to dimensions of inadequate water access and supply. The paper describes how perceptions of risk are shaped and how households seek to reduce possible health impacts and potential economic losses through aversion behaviours. The paper analysed households' activities relating to water

storage, treatment and usage, together with water source preference using a qualitative approach, and through this, the authors developed a framework that describes actual risk, risk perceptions and aversion behaviours. The paper makes recommendations aimed at improving future approaches to the study of aversion behaviours.

Nigerian Institute for Social and Economic Research, NISER (1988) observes that most households' daily water consumption varies greatly. Majority of the households, who are low income earners use about 32-80litres and middle income earners, 80-125litres daily, while others range between 120-240litres per day for high income earners.

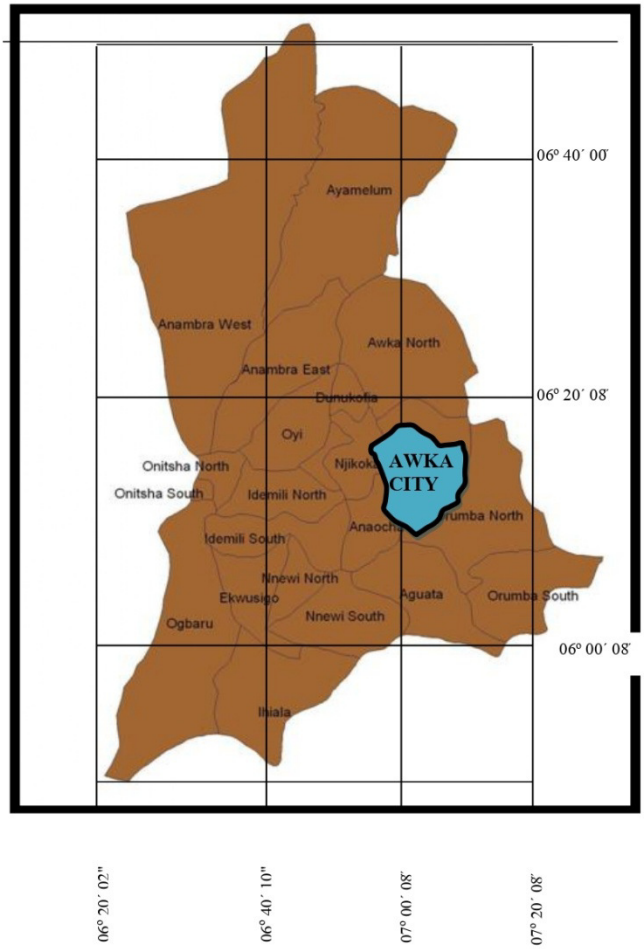
It is a widely held view that long distance to water supply is a deterrent to the use of water in desirable quantities and of the alternative sources such as hand-dug wells, streams, ponds and water from water vendors are prone to easy contamination; consumers are readily exposed to water-borne diseases such as typhoid, dysentery, cholera and guinea worm.

In formulating country-specific definitions, such factors as quantity, time, distance, reliability and potentially cost are taken into consideration.

3. Study methodology

3.1 The study area

The study on which this paper is based was conducted in the capital city of Anambra state of Nigeria, which is referred to as Awka metropolis. For ease of reference, Awka metropolis comprises of Awka and Amawbia towns, both of which are in Awka South Local Government Area.The two towns are so interwoven to such extent that it will be quite difficult to define their real boundaries. For example, if you are moving westwards from Awka, you will pass through Amawbia before entering another village in Awka called Umuokpu. It is, however, instructive to note that Awka as the capital of Anambra state is made up of five local government areas and extends to fifteen kilometre radius, which is commonly referred to as Awka Capital Territory, but the study is limited to Awka metropolis (Map 1).



Map1: Map of Anambra State showing the study area
Source: Ministry of Lands Survey and Town Planning, Awka

3.1.2 Geographical settings:

i. Climate

The area under discussion lies within the tropical wet climate zone with clear-cut wet and dry seasons. Nearly eight out of the twelve months of the year enjoy rains, while the four remaining months fall within the dry season.

These two seasons are brought about by the two predominant winds that pervade the area: the south western monsoon winds from the Atlantic Ocean and the north eastern dry winds from across the Sahara desert. The harmattan – a particularly dry and dusty wind occurs for about two weeks within the dry season usually between November and February (Iloeje, 1980).

ii. Temperature

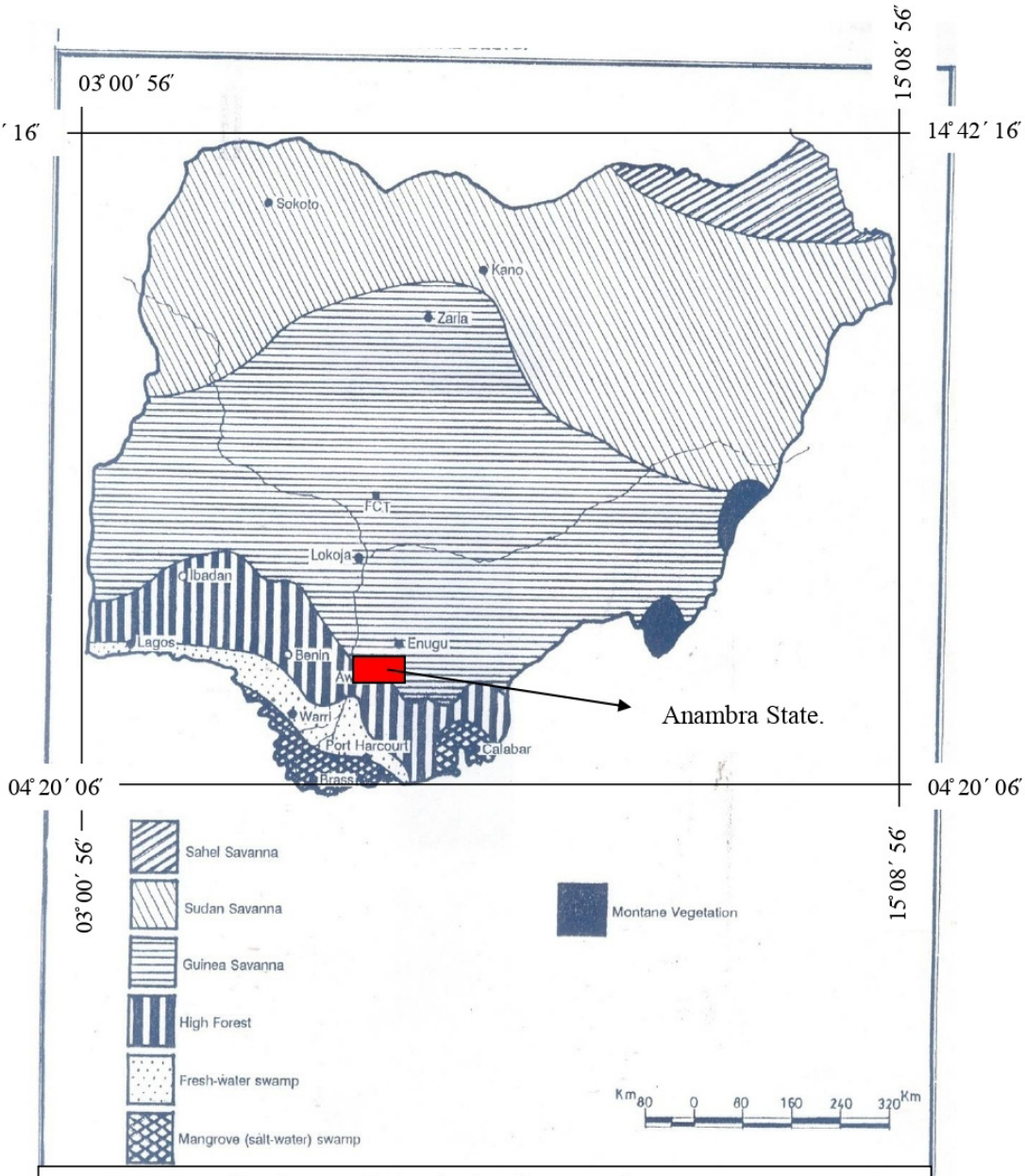
High temperatures in the range of (27-28^{0}C) are the routine in Awka Capital Territory. This increases to about 35^{o}C between February and April which is the hottest period (Ofomata, 1975, p.16). The coolest periods occur about mid July and late December to early January – the middle of the rainy season and the harmattan respectively.

iii. Rainfall and humidity

High humidity and rainfall characterize the Awka region. These produce considerable discomfort. The mean annual rainfall recorded is 1,485.2mm with mean monthly figure of 50mm and an absolute daily maximum of over 200mm is recorded between June and August in the area.

iv. Vegetation

Ordinarily, Awka and its environs fall within the rain forest belt of Nigeria, but pressure on land from both agricultural and commercial activities has largely reduced the vegetation here to mixed savanna. Only along stream courses and in few preserved areas can one find some rain forest trees such as iroko, soft wood, domesticated species like oranges, mangoes etc. Palm trees and coconut trees are quite common in residential areas for their economic value. However, the predominant vegetation here is mixed savanna (Map 2).



Map 2 : Vegetational map of Nigeria showing Anambra state
Source: N.P Iloeje A New Geography of Nigeria, 1980

v. Topography

Most parts of the territory lie below 300metres above sea level on the plain of the Mamu River. This portion is fairly flat and tilts very gently towards the Mamu River. Two ridges or cuestas both lying in a north-south direction form the major topographical features of the area.

The higher ridge reaches its highest point at Agulu outside the Capital Territory. About six kilometers east of this, the minor cuestas peak at about 150metres above sea level at Ifite-Awka. The valley or plain surrounding this portion hosts Awka, Amawbia, Umuokpu, Nibo, Mbaukwu and Umuawulu towns.

3.1.3 Settlement pattern:

Awka town comprises two distinct sectors- the built up portion, over-crowded and unplanned with poor road system and the land with little housing. The open area is north of the Enugu – Onitsha expressway and has been primarily used for agriculture.

3.1.4 Water Supply in Awka:

For many years the water taps in the area have remained dry. There appears to be a complete break-down in this sector. The residents depend largely on borehole water hawked by water tankers for their domestic uses. While sachet and bottled water have mercifully aided the residents for their drinking needs.

The Water Board, which is charged to provide potable water, is epileptic at the moment. The water mains are not only old, but are inadequate (Awka Structure Plan 2008).

3.2 Study Population

The population for the study refers to the universe from which the sample for the study was drawn. The population figure of Awka as projected in 2020 was 138,683 using Malthusian Population Projection formula. This was projected from 2006 population census of Awka which stood at 92,951 (NPC, 2006). The projection was based on the National Population Commission's recommended annual exponential population growth rate of 2.9.

Since the neighbourhood by neighbourhood population figures of the 2006 census results were not available, a pilot study was conducted using the available city figure as baseline to generate

the unit by unit population figures of the neighbourhoods as shown on Tables 3a and the national average household size of 6 as recommended by the National Demographic and Health Survey (NPC, 2008).

3.2.1Sampling frame of household

For the purpose of this study, the household size was put into consideration. Here, household refers to people occupying one dwelling unit and feeding from one pot (NPC, 2006). The average household size of 6 as recommended by the NPC was used. See Table 3a.

Table 3a: Neighbourhood population of Awka urban core

S/N (a)	Neighbourhoods (b)	2006 Base population (c)	2020 Projected population (d)	National household size (e)	Sample frame of households (f) (d/e)
1	Enuifite Awka	4,666	6,962	6	1,160
2	Ezinato Ifite Awka	1,555	2,320	6	387
3	Agbani Ifite Awka	778	1,161	6	194
4	Umuzuocha Amenyi Awka	7,776	11,602	6	1,934
5	Amaudo Amenyi Awka	4,666	6,962	6	1,160
6	Amachala Amenyi Awka	4,665	6,960	6	1,160
7	Umuayom Amenyi Awka	1,555	2,320	6	387
8	Umuoramma Amenyi Awka	2,333	3,481	6	580
9	Umunneoke Amenyi Awka	3,110	4,640	6	773
10	Nkwele Amaenyi Awka	1,555	2,320	6	387
11	Umunenagu Agulu Awka	3,110	4,640	6	773

12	Umuogbu Agulu Awka	1,555	2,320	6	387
13	Unnamed	1,555	2,320	6	387
14	Umunedin Agulu Awka	788	1,176	6	196
15	Umuike Agulu Awka	2,333	3,481	6	580
16	Umudioka Ezi-Awka	10,109	15,081	6	2,513
17	Umuogbunu Ezi-Awka	1,555	2,320	6	387
18	Umukwa Ezi-Awka	1,555	2,320	6	387
19	Umuogwali Ezi- Awka	778	1,161	6	194
20	Umueri Ezi-Awka	788	1,176	6	196
21	Omuko Ezi-Awka	778	1,161	6	194
22	Obinagu Amikwo Awka	1,555	2,320	6	387
23	Iyiagu Amikwo Awka	3,110	4,640	6	773
24	Isiagu Amikwo Awka	6,221	9,282	6	1,547
25	Okpaeri Amikwo Awka	3,110	4,640	6	773
26	Igwe Ogige Amikwo Awka	3,110	4,640	6	773
27	Umuokpu Awka	3,110	4,640	6	773
28	Omuorji Amawbia	910	1,358	6	226
29	Umueze Amawbia	3,944	5,885	6	981
30	Ngene Amawbia	4,553	6,793	6	1,132
31	Adaebebe Amawbia	2,276	3,396	6	566
32	Ezimezi Amawbia	1,517	2,263	6	377
33	Umukaba Amawbia	1,517	2,263	6	377
34	Old Govt. Station	455	679	6	113

Total		**92,951**	**138,683**		**23,114**

Source: Researcher's calculation, 2022

3.2.2 Sample size and sampling technique

The study was conducted using household questionnaires as the means of gathering data. Out of a total of thirty four neighbourhoods, ten were randomly selected and this represents both the formal and informal settlements. The names of the selected neighbourhoods are as contained in Table 3b.

Having earlier stated that Awka metropolis is made up of Awka town and Amawbia town, the proportion of the households sampled was based on the size and population of each town. This implies that Awka with larger population size constituted more of the sampled households studied. Ten percent of each of the neighbourhoods selected was sampled through stratified random sampling technique.

Table 3b: Sample frame of the selected households in the two towns

Neighbourhoods **(a)**	**Population** **2020** **(b)**	**Sample frame of Households** **(c)**	**10% of total Households sampled per neighbourhood** **(d)**
Adabebe Amawbia	3,396	566	57 -10%
Umueze Amawbia	5,885	981	98
Ezimezi Amawbia	2,263	377	38
Old Govt. Station Amawbia Umunedin Agulu Awka	679 1,176	113 196	11 20
Agbani Ifite Awka	1,161	194	19

Umuogbu Agulu Awka	2,320	387	39
Enuifite Awka	6,962	1,160	116
Umuike Agulu Awka	3,481	580	58
Umuokpu Awka	4,640	773	77
Total	**31,963**	**5,327**	**533**

Source: Researcher's calculation, 2022

From Table 3b above, 'A' represents the neighbourhoods from which the samples were drawn from the two towns; 'B' represents the projected 2020 population at 2.9 per cent growth rate; 'C' represents the sample frame of households obtained by dividing 'B' with the national average household size of 6; and 'D' represents the percentage of the household sampled.In this way, the 533 households that constituted the sample for the study were proportionately sampled from the different selected neighbourhoods in the study area.

The questionnaire was administered to the housewife or female head of each household. The womenfolk was used because the women usually stay at home more than the men, take care of the children when they are sick, carryout domestic chores etc. In cases where this was not applicable, the breadwinner was administered as household head. Data for the study was obtained through structured interview (questionnaire administration) with the residents of the study area.

Both qualitative and quantitative data collected were coded and analysed using the SPSS computer software package. Percentages, graphs and charts were used to present the outcome.

It is, however, noted that the study was hampered by a lack of up-to-date data as the last census was conducted in 2006, and the projected population figures cannot be said to be foolproof as many factors do affect population distribution either positively or negatively.

4Data presentation and discussion of finding

4.1 socioeconomic characteristics of the respondents

4.1.1 Occupation

Majority of the households surveyed were civil servants (74.1%). The survey shows that 19.3% of the respondents were self-employed or traders. Less than one tenth (4.5%) of the interviewees were unemployed, while 2.1% of the respondents were apprentices (Table 4a). The findings appear to be in line with the generally held view that majority of the people living in Awka metropolis are civil servants. The predominance of civil service over other occupations is graphically presented in Figure 1.

Table 4a: Occupation of respondents

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Civil servant	395	74.1	74.1	74.1
	Self employed	103	19.3	19.3	93.4
	Apprentice	11	2.1	2.1	95.5
	Unemployed	24	4.5	4.5	100.0
	Total	533	100.0	100.0	

Source: Author's survey, 2022

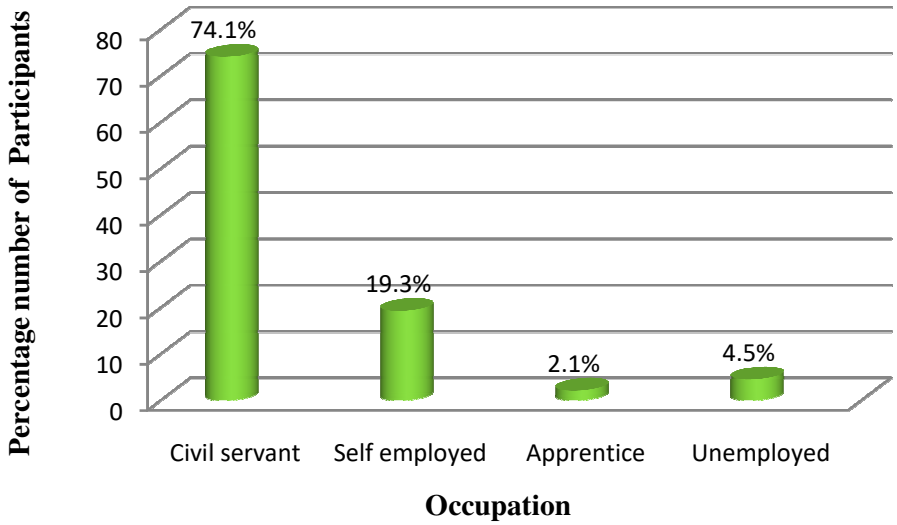


Figure 1: Percentage frequency distribution of participants categorized by their occupations.

4.1.2 Household size

The study also looked into tenure arrangements and occupancy ratio as well as the extent to which residents liked their neighbourhoods. As can be seen from Table 4b, one hundred and twenty six families representing 23.7% of the respondents had 5 members living together. It was equally observed that 30.9% of surveyed households had 6 or more members, while 24.3% of the households had 4 members living together. In the same vein, 20.9% of the respondents had between 1 and 3 members as households. One household refused to respond to this question. The graphic representation is as shown in Figure2.

Table 4b: Number of people per household

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	12	2.3	2.3	2.3
	2	38	7.2	7.2	9.6
	3	61	11.4	11.4	21.0
	4	130	24.3	24.3	45.3
	5	126	23.7	23.7	69.0
	6+	165	30.9	31.0	100.0
	Total	532	99.9	100.0	
Missing	system	1	.1		
Total		533	100.0		

Source: Author's survey, 2022

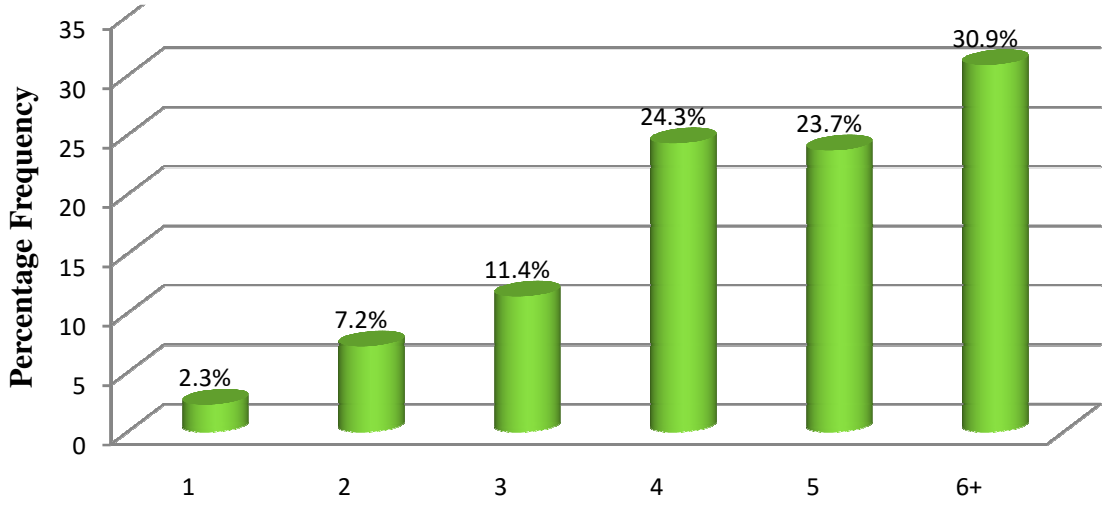


Figure 2. Percentage frequency of Household size within the Neighborhoods of the Study Area as Reported by Participants

4.1 Water supply and access

4.1.1 Sources of water

The study found that 250 households representing 46.9% of the respondents reported getting water from boreholes within their neighbourhoods, 12% reported sourcing water from wells in their compounds. Those who rely on rain harvesting as their source of water supply represent 6.9% of the respondents, while 6.6% of the respondents source their water from rivers/streams. No respondent reported sourcing water from water board communal standpipes.

Meanwhile, a total of 147 respondents representing 27.6% obtain water from other sources such as water vendors (i.e., water tanker drivers). See Table 4c.

Findings from the household survey show that water supply in the study area is dominated by borehole system. Sources of water supply in the neighbourhoods of the study area can be categorized as safe since over 60% of the respondents source their water from facilities (boreholes and protected dug wells) which Global Water Supply and Sanitation Assessment Report (2000) and UNDP (2002) consider to be improved sources of water supply. Other sources such tanker truck water, rivers/streams and rainwater harvesting, which the WHO and UNICEF (2010) defined as unimproved water sources represent negligible number of respondents.

Table 4c: Primary sources of drinking water within the study area

Variable	Neighbourhoods										Total	Percentage
Source of water	Adabebe Amawbia	Umueze Amawbia	Ezimezi Amawbia	Old Govt. Station	Umunedin Agulu	Agbani Ifite Awka	Umuogbu Agulu	Enuifite Awka	Umuike Agulu	Umuokpu Awka		
Rainwater harvesting	6	4	4	0	2	1	6	5	6	3	37	6.9
River/stream	3	5	4	0	2	2	4	6	4	5	35	6.6
Borehole	25	44	14	7	9	10	15	61	24	41	250	46.9
Own well on plot	8	11	6	1	2	2	4	14	6	10	64	12
Water board stand pipe	0	0	0	0	0	0	0	0	0	0	0	0
Others e.g. water vendor	15	34	10	3	5	4	10	30	18	18	147	27.6
Total	57	98	38	11	20	19	39	116	58	77	**533**	**100**

Source: Author's survey, 2022

4.1.2Time spent to access water

The result of the questionnaire survey on time taken to collect water, which includes time travelling to and from the water point and queuing as presented in Table 4d, shows that the residents of the study area have good access time as 365 households representing 68.4 per cent of the total respondents claimed that they collect their water within the WHO (2003) recommended time of 5 to 30 minutes. 23.6% of the respondents reported taking less than 5 minutes collection time to access water, even 2.8% reported having continuous supply of water in their compounds. However, 8 respondents, which representing 4.2% of those sampled, claimed that they spent more than 30 minutes to collect water at the nearest facility.

From the above, the proportion of people accessing water within the WHO (2003) recommended collection time is more than 90%, which cuts across basic, intermediate and optimal service

delivery, and this shows a good collection time on the part of the residents of the study area. Figure 3 shows the graphic presentation of time.

Table 4d: Time spent to collect water at the nearest facility within the study area

Variable	Neighbourhoods										Total	Percentage
Time in minute	Adabebe Amawbia	Umueze Amawbia	Ezimezi Amawbia	Old Govt. Station	Umunedin Agulu	Agbani Ifite Awka	Umuogbu Agulu	Enuifite Awka	Umuike Agulu	Umuokpu Awka		
0 min	0	1	0	5	2	2	1	2	1	1	15	2.8
Less than 5 min	16	27	5	3	4	3	7	28	9	9	111	20.8
Within 5-9 min	29	41	12	7	9	11	12	46	19	21	207	38.8
Within 10-30 min	10	23	18	1	5	4	16	28	20	33	158	29.6
30 min +	2	4	2	0	2	0	3	10	8	11	42	8
Total	57	96	37	16	22	20	39	114	57	75	**533**	**100**

Source: Author's survey, 2022

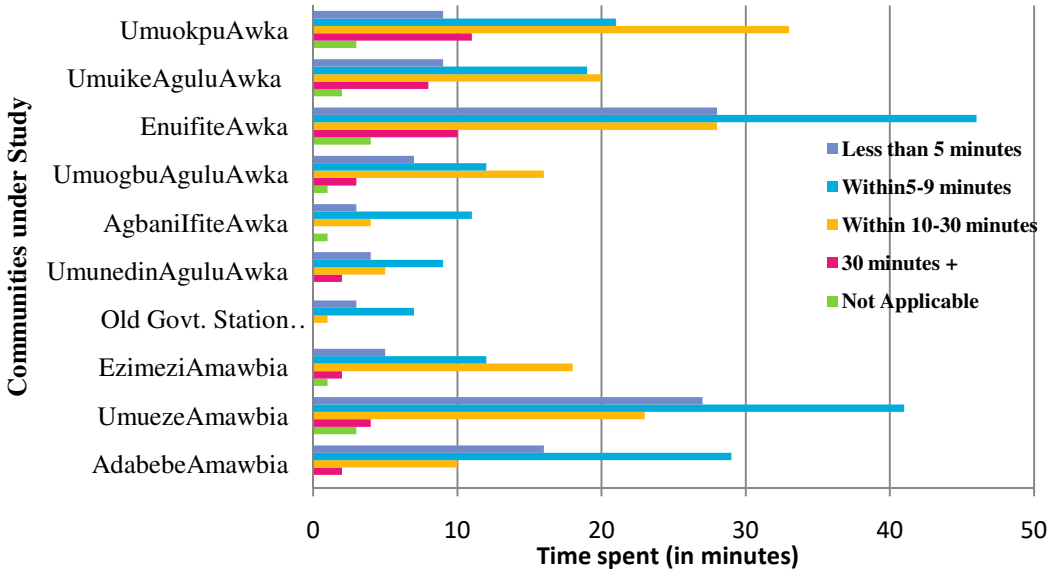


Figure 3. Frequency of Time Spent Collecting Water at the Nearest Facility in the Study Area

4.1.3Distance travelled to access water

On the distance trekked to fetch water at the nearest facility, the questionnaire survey result as presented in Table 4e shows that 510 respondents, who represent 96 % of the total respondents, travel less than 1km to fetch their water. Out of this, a whopping figure of 359 or 67.4% respondents collect their water within a distance of 10 meters and 99 respondents out of this figure reported having water supplied to their households continuously. Only23 respondents representing 4 % could be said to have no access to water as they reported travelling beyond the WHO (2003) recommended distance of 1000metres to collect water at the nearest facility. Relying on the WHO/UNICEF (2000) definition which states that access to water is "the availability of 20litres per capita per day at a distance no longer than 1,000metres", one can rightly conclude that the residents of the study area have good access to water, and this goes to prove that the study area is on track in meeting the Sustainable Development Goal on water as far as distance travelled to collect water is concerned. The preponderance of boreholes and water vendors in the neighbourhoods of the study area as witnessed during field survey may have greatly contributed to this easy access.

Table 4e: Distance traveled to collect water at the nearest facility within the study area

Variable	Neighbourhoods										Total	Percentage
Distance in metres	Adabebe Amawbia	Umueze Amawbia	Ezimezi Amawbia	Old Govt. Station	Umunedin Agulu	Agbani Ifite Awka	Umuogbu Agulu	Enuifite Awka	Umuike Agulu	Umuokpu Awka		
0	2	4	5	28	10	12	14	10	8	6	99	18.6
10-99	36	25	22	12	30	28	22	28	33	24	260	48.8
100-200	26	28	20	1	10	7	8	6	4	5	115	21.6
210-999	9	8	4	0	4	2	4	1	2	2	36	7
1000+	7	8	3	0	0	2	0	2	1	0	23	4
Total	80	73	54	41	54	51	48	47	48	37	**533**	**100**

Source: Author's survey, 2022

4.1.3Quantity of water consumed

The result of the survey on the quantity of water consumed by various households in the neighbourhoods of the study area, which is presented in Table 4f shows that 490 respondents, which stand for 92 % consume 20l/c/d and above - a level of service which WHO (2003) certifies as good access. The breakdown of this figure shows that 203 households or 18.1 %, which represents basic access, reported that they consume between 20 and 49l/c/d; 262 households (49.2 %), which represents intermediate access, reported 50-99l/c/d; 25 households (4.7 %), which represents optimal access, reported 100l/c/d and above, while 7 households (1.3%)reported consuming above 150l/c/d of water per day. Only 43 respondents or eight per cent of the entire responses can be classified as having no access as they consume below the globally recommended threshold, whichis less than 20litres per capita per day.

Table 4f: Quantity of water consumed per household within the study

Variable	Neighbourhoods										Total	Percentage
Quantity in litres (l/c/d)	Adabebe Amawbia	Umueze Amawbia	Ezimezi Amawbia	Old Govt. Station	Umunedin Agulu	Agbani Ifite Awka	Umuogbu Agulu	Enuifite Awka	Umuike Agulu	Umuokpu Awka		
5-19	7	9	5	0	3	1	4	7	3	4	43	8
20-49	17	41	15	2	7	4	14	49	23	31	203	38.1
50-99	30	45	17	6	10	11	19	54	30	40	262	49.2
100-149	1	1	0	7	2	2	1	2	2	0	18	3,4
150+	0	1	0	3	1	1	0	0	1	0	7	1.3
Total	55	97	37	18	23	19	38	112	59	75	**533**	**100**

Source: Author's survey, 2022

4. Summary of findings, conclusion and recommendations

This study was undertaken to evaluate the level of water provision in the capital of city of Anambra state of Nigeria with a view to ascertaining whether the residents of the various neighbourhoods of the city are accessing water in line with the tenets of the Sustainable Development Goal target on water, which seeks to improve access to water by the year 2030.

The findings of the study conducted in ten neighborhoods', which involved formal and informal settlements indicate considerable improvements in water provision. It was discovered that this improvement was greatly enhanced by the efforts of non-state actors in water service delivery. The state water board whose primary responsibility it is to make water available to the residents of the city is not living up to its responsibility as none of the households sampled reported collecting water from the communal standpipes owned by the state water board.

The combined results of the analysis in Tables 4c, 4d, 4e and 4f, which sought to answer the earlier stated research questions concerning water provision to the residents of the neighbourhoods of the study area revealed great improvements in access to water with respect to sources of water, time spent to collect water, distance travelled to collect water and quantity of water consumed per capita per day.

The findings also revealed that a greater number of the peopled interviewed lacked access to public water supply in the form of house connections to tap as lack of access to publicly subsidized water can greatly enhance poverty among the residents of the city since large amount of money and valuable time is spent in accessing water outside one's compound.

Non-functioning of the state agency responsible for water management makes the respondents to rely heavily on borehole, which alone accounts for 46.9% of water source. It was equally discovered that many of the well-to-do respondents have either their own boreholes or dug wells with which they meet their daily water needs. Those who have boreholes in their compounds, apart from satisfying their own water needs, sell water to other residents within the neighbourhoods, while some dug boreholes purely for commercial purposes.

The findings showed that access to water in the city is affected by a variety of factors, prominent among which are facility availability (storage facility), cost and distance travelled to collect water atthe nearest facility and waiting time. However, it remains to be ascertained whether these sources of water constitute what WHO/UNICEF (2010) defines as safe sources of water since no laboratory test was carried out to ascertain the quality of water obtained from the various sources.

Although there are various players contributing significantly towards water provision in the city, their activities are, however, greatly hampered by inadequate coordination at policy and operational levels.

Consequently, it is recommended that the state water board (Anambra State Water Corporation), which is the agency primarily vested with the task of water provision in the city in particular and the state in general, should be rejigged to live up to its responsibility by ensuring that water provided to the residents of the state is safe for human consumption.

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