Water Supply as an Index for Assessing Sustainable Rural Development in Imo State

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Article Info

Abstract

This study explores water supply as an index for assessing rural development in Imo State. The objective of the study is to investigate the sources of water supply, distances travelled in search of water, Household rating of water supply, amount spent on water and the contribution of water supply to the development of rural communities in Imo State. Primary data were generated using structured questionnaire, oral interview and field observations while secondary data were obtained from published and unpublished documents. The data were analyzed using percentages, person's product, moment correlation co-efficient and student-t-test model. The results show that there is a statistically significant relationship between water supply and development among the LGAs studied. Also, the pipe-borne water found in a few sampled communities is grossly inadequate. Finally, private boreholes and hand pumps remain the most common sources of water for residents. This study recommends for immediate proactive interventions through planning, funding, implementation and monitoring of rural water supply by the government and donor agencies for effective actualization of clean, safe water and sanitation agenda of the sustainable development goal. Also, community efforts should be intensified in rural areas in the provision of safe, accessible, and secure water supply.

1. Introduction

One of the cardinal targets of the United Nations' (UN) Sustainable Development Goals (UNSDGs) objective 6 sets access to safe drinking water as a priority for human development [1, 2]. In the sub-Saharan region of West Africa and allied water-stressed communities in the humid Tropics, a progressive decline in good water quality supply and upsurge in water demands have made planning and management of water resources a difficult task in such locations. In exploring the vitality of water, it is established that 'water quenches our thirst, grows food, produces energy, and sustains the earth's ecosystems' [3]. Discounting the perceived values, the quality and quantity of water across distinct geographical spaces differ [4], thereby constraining or facilitating the level of safety, access and utilization by humans and ecosystems.

In another dimension, achieving the sustainable development agenda of "ending hunger, equitable hygiene and sanitation, and sustainability of agricultural production requires access to adequate, safe, and good quality water [1, 2, 5]. The viewpoints suggest that water is a nucleus and catalyst for actualizing sustainable rural development. Yet, the dynamics in water sources (such as rain, wells, boreholes, underground, springs, rivers, and Oceans) and the corresponding differences in

peoples' capacities have created a disequilibrium in water quality, quantity, and users' satisfactions. The perceived disconnects coupled with the multiplier impacts of climate change, rapid population growth, and socioeconomic issues [6], tend to exert much pressure and suffering to diverse water users in the rural areas with high decay or eclipse in nature of infrastructural and amenities development [7].

Prior to and after 1960, rural water demand and supply in Nigeria has remained inconsistent given the protracted national population growth rate and uncertainties in the socio-economic development. It suffered from poor coordination, lack of clear policy direction, lack of focus in terms of goals and objectives which have resulted in the country's inability to achieve full coverage of the rural population with safe water and improved sanitation services [8]. In another dimension, it is reported 'water supply services, where they exist, are unreliable and of low quality and are not sustainable because of inefficient management, poor operation and pricing and failure to recover costs' [9]. Currently, the existing institutional structure at the Federal, State and Local levels of Government would not be optimal for accelerated access [9]. The identified perspectives suggest serious potential threats to the successful actualization of United Nation Agenda on sustainable provision of clean and safe water in most Nigerian communities, which can invariably impaired rural development.

Within the context of literature, Bolkin and Keller [10] opine that water is necessary for sustenance of human and organisms' life. Thus, the functionality of ecosystems, human body weight as well as plants and animals depend on the quality of water available. Indeed, the perspective attest for Chorley cited in Umo [11] notion that 'water is the blood of the Earth'. It is also perceived as one of the catalysts for geographical, social, cultural, economic, and political development of any society [4].

National Bureau of Statistics [12] observed that less than 28 percent of the households in Nigeria use improved water sources for drinking and basic sanitation. Similarly, the United Nation Development Programme [13] reported that many households in Nigeria today have access to less than 25 litres of water per person that is required to meet the basic human needs. Furthermore, it is observed that apart from having water to drink, people require it for food production, industrial processes, recreation and mostly sanitation (WHO, cited in Umo et al. [14]. In context of Imo State, the Otamiri regional Water Scheme in conjunction with the Anambra-Imo River Basin Development Authority had made some remarkable achievements in qualitative and quantitative rural and urban water supply prior to the 21st Century 14].

Despite the past efforts to boost quality water supply by individuals, government, and donor agencies, there still exists a wide gap in coverage among rural communities in Nigeria. The persistent fiddling of the role of River Basin Development Authorities in providing, supervising, monitoring quality and quantity of water demand/ supply especially by low-income individuals have compel most rural residents to over relied on the river and/ or rainwater, often with poor quality, for drinking and domestic purposes [15]. Hence, Okereke [15] observes that households trek long distances to collect water from shallow wells, ponds, streams and springs, many of which are in difficult terrains.

Within the context of constraining variables, is obvious that many water projects are operating below their designed levels, thereby affecting equitable service distributions to the rising population of end-users. Okereke [15] opines that most water supply schemes are mainly boreholes with installed hand pumps that are too complex and beyond the technological know-how of the benefiting communities. In effect, the distributions of water projects across geopolitical zones and communities remain uneven, leaving large densely populated communities out-of-reached. This affirms Federal Republic of Nigeria [16] report that access to water supply and sanitation in Nigeria has remained inadequate arising from years of neglect in the country.

Contextually, apathy or unwillingness to invest or execute functional public water projects by community representatives and government tend to hamper sustainability in water and allied

infrastructural development in some rural communities. Hence, this study is instituted to determine whether access to improved water supply is pivotal to sustainable development of the rural as well as to establish the level of relationships between water supply and development of rural communities in Local Government Areas of Imo State. Such findings hold high potential to give policy perspectives that can aid in the actualization of sustainable development in rural areas.

The main purpose of this study is to assess water supply as a determinant for sustainable rural development in Imo State. The four specific objectives that were investigated are:

1. To identify and compare the focal sources of water supply in the rural communities within the three geopolitical zones of Imo State.

2. Determine and assess the distances travelled by rural dwellers to access water in the three geopolitical zones of Imo State.

3. To evaluate the daily amount of money spent in purchasing water by household in the three geopolitical zones of Imo State.

4. Examine the contributions of water to the sustainable rural development of Imo State.

1.1. The Study Area

Imo State is located between Latitudes $4^0 4^1$ and $7^0 15^1$ North of Equator and Longitudes $6^0 5^1$ and $7^0 25^1$ East of Greenwich Meridian [9]. Relatively, it is bounded by Anambra State in the East, by Abia State in the West, and Rivers State in the South [9]. The State has a total land area of 5,100 km². It consists of 27 Local Government Areas and is divided into three senatorial zones (Okigwe, Owerri and Orlu). Imo State has 360 autonomous communities, but later increase to over 640 in 2016. The geological formations of the area comprise cretaceous, Paleocene, Eocene, Pleistocene for Okiwe and Orlu zones, while Owerri zone is dominated by the Coastal Plains Sand Deposits of Tertiary Times [9].
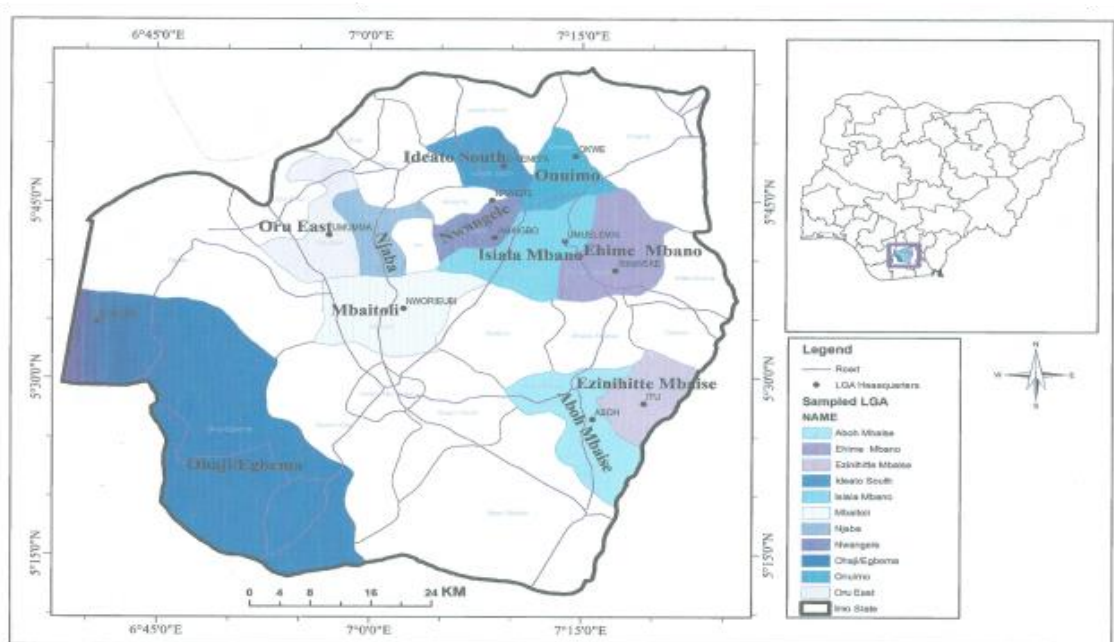

Figure 1: Imo State showing Sampled Locations

The climate of the study area is classified into four climatic seasons (i.e. peak rainy, early rainy, peak dry and early dry seasons) [11]. The mean annual rainfall is over 2250 mm with a mean

temperature above 26.7^0 Celsius [17]. The relative humidity varies within the range of between 75 percent for dry season and 90 percent for rainy seasons. Recently, there are marked evidences of rising temperature and rainfall in the area due to global warming [18]. The state lies within the rainforest belt of Nigeria with the varying forest patterns enrich with high proportion of humus contents soils induced by decayed of vegetation materials.

2.0. Materials and Methods

This study is empirical in nature with survey design. The secondary data for this study were generated from published and unpublished documents, while primary data were generated through structure questionnaire, oral interview, and direct field observations. Multi-stage samplings were used in sampling techniques. First, selection of Local Government Areas through stratified sampling. Second, selection of communities for study based on random sampling and; third, selection of respondents from households using systematic sampling.

In the selection of the LGAs, the urbanized and peri-urbanized LGAs were excluded because of the availability of strategic infrastructure facilities and amenities as reported in Enwereuzor and Umo [7] and Charles-Akalonu, Umo, and Enwereuzor [19] will negatively affect respondents' level of objectivity and the aim of this study [20]. Finally, 11 LGAs are selected from the 22 rural LGAs by choosing the ones that fall under odd numbers in the alphabetical order of their names. The LGAs selected are Ehime Mbano (Eh), Isiala Mbano (IM) and Onuimo (ON) from Okigwe zone. From Orlu zone, the LGAs include Ideato South (IS), Njaba (NJ), Nwangele (NW), Ohaji/Egbema (EG) and Oru East (OE). While from Owerri zone, Aboh Mbaise (AM), Ezinihitte Mbaise (Em) and Mbaitoli (MB) LGAs are selected.

The communities are selected by random sampling called "hat and draw" method. The names of the communities in the sampled LGAs are written on pieces of paper, rolled into balls, shuffled thoroughly in a black polythene bag and four communities are, by lucky dip strategy, drawn from each of the sampled LGAs. The procedure is used for 4 communities per LGA as a base stem from the fact that one of the sampled LGAs, Onuimo, has four communities. Therefore, to maintain the principle of equality among the LGAs, four communities are drawn from each of the Local Government Areas.

3.0. Results and Discussion

The demographic characteristics of 44 communities covered in this study have the information from them collated according to their respective LGAs and the following acronyms are used in all the tables in this research.

3.1. Assessments of the Rural Water Sources in Imo State

To assess the situation of water supply in Imo State, the respondents were asked to indicate their sources of water supply. The results of their perceptions summarized in Table 1 differ based on the political zones and Local Government Areas. Contextually, a total of 271 respondents, which represent 43.2 percent identified borehole as the main source of water supply in their communities. Furthermore, streams and rivers as sources of water supply attracted 93 respondents, accounting for 14.8 percent, while tankers as a source of water supply is supported by 74 respondents, representing 11.8 percent in the study area. Roof catch is supported by 53 (8.5 percent) of the respondents. More so, wells constitute 59 respondents (9.4 percent).; pipe borne water is indicated only by 41 or 6.5 percent of the respondents, hand pump 33 or 5.3 percent while pond as source of water supply is indicated by 0.5 percent.

Table 1: Descriptive Assessments of Sources of Water Supply

Water Supply	Frequency												
	Okigwe Zone			Orlu Zone					Owerri Zone				
Sources	Eh	IM	ON	IS	NJ	NW	EG	OE	AM	EM	Mb	Total	%
Hand pump	0	0	1	0	0	0	29	0	0	0	3	33	5.3
Pipe borne water	1	3	5	1	3	2	0	9	9	2	6	41	6.5
Streams/ Rivers	7	4	22	14	4	18	7	9	3	2	3	93	14.8
Wells	2	3	3	19	4	9	0	8	2	0	9	59	9.4
Water tankers	8	31	3	5	0	9	1	7	2	0	8	74	11.8
Boreholes	5	20	3	4	19	39	22	32	54	13	27	271	43.2
Roof catch	6	4	1	12	0	7	4	6	5	4	4	53	8.5
Pond	0	0	0	0	0	0	0	1	0	2	0	3	0.5
Total	29	65	71	55	30	84	63	72	75	23	60	627	100

Source: Authors' Analysis (2024).

In Isiala Mbano LGA, 31 out of 65 respondents representing 47.7 percent say their source of water supply is the water tankers while 20 out of 65 representing 30.8 percent say boreholes are the source of water supply in their communities. In Ideato South, 25.5 percent indicated streams/rivers while 34.5 percent says they get water supply from wells. 46 percent of respondents in Ohaji/ Egbema indicated hand pump as source of water supply while 34.9 percent says water supply in the communities comes from boreholes. In Aboh Mbaise 12 percent indicated pipe borne water while 72 percent indicated boreholes as source of water supply in each of the sampled communities.

A look at Table 1, shows that Ohaji/Egbema LGA has its highest frequency of 29, representing 46 percent for handpump as their source of water supply; Ideato South has its highest frequency of 19 or 34.5 percent for wells as source of water supply while Isiala Mbano records its highest frequency of 31 or 47.7 percent for water tankers as source of water supply and Ehime Mbano 8 or 27.6 percent also indicated water tanker as the main source of water supply in their communities, thereby supporting Onyebande [9] report that water supply services, where they exist, are unreliable and of low quality and are not sustainable because of inefficient management, poor operation and pricing and failure to recover costs. The remaining seven local government areas have their highest frequencies on boreholes as source of water supply. These LGAs are Onuimo 36 or 50.7 percent; Njaba 19 or 63.3 percent Nwangele 46.4 percent; Aboh Mbaise 54 or 72 percent; Ezinihitte 13 or 56.5 percent; Mbaitoli 27 or 45 percent and Oru East 32 or 44 percent.

From the data, boreholes appear to be the main source of water supply in the sampled communities. Other sources as indicated by the respondents are water tankers, streams/rivers, hand-pump and wells. Hand pump and boreholes as source of water supply are captured on Plates 4.6 and 4.7. It is worrisome to discover that there is no functional pipe borne water schemes in all the sampled communities as only 6.5 percent of the respondents indicated pipe borne water as source of water supply. The presence of potable (pipe borne) water scheme is a measure of the level of development and their absence is the main cause of rural-urban migration [21, 22].

3.2. Distances Travelled, Accessibility, and Adequacy of Rural Water Supply

To explore the dynamics in distances rural dwellers, travel to access water for domestic uses, data generated during fieldwork are analyzed descriptively and the results are summarized in Table 2 for comparisons. From the results, zero to one kilometer is recorded by 54.4 percent of the respondents as the distance covered in search of water in their communities as shown in Table 2,

two to three kilometers are covered by 193 or 31.4 percent of the respondents while 57 or 9.3 percent travel four to five kilometers to fetch water for domestic purposes in the study area. The rest 2.9 percent of the respondents travel for over six kilometers to fetch water.

The highest frequency for zero to one kilometer is recorded in the sampled local government areas as distances travelled to fetch water for domestic purpose except in Ideato South where 28 and 15 respondents out of 51 say they cover as much as two to five kilometers in search of water for domestic uses. From the results, it appears that the presence of boreholes in the sampled communities has reduced the distances travelled by households in search of water as indicated by respondents in Table 2. The result show strong affirmation of National Bureau of Statistics [12] report that less than 28 percent of the households in Nigeria use improved water sources for drinking and basic sanitation. Therefore, a juxtaposition of the distinct distant travelled by the respondents to suggest that there is fair access to water supply in the sampled communities. However, it is better to allow the respondents to do the assessment

Table 2: Distance Dynamics to Access Water for Domestic Purposes

| Access Distant | Frequency | | | | | | | | | | | Grand Total | Percent | Rank |
| | Okigwe Zone | | | Orlu Zone | | | | | Owerri Zone | | | | | |
	Eh	Is	On	Ids	Nj	Ng	Oh	Ou	Ab	Ez	Mb			
0 – 1km	11	45	34	7	13	38	49	44	54	19	33	347	54.4	1st
2 – 3km	8	18	29	28	2	35	9	25	17	3	19	193	31.4	2nd
4 – 5km	3	1	6	15	8	9	4	2	1	1	7	57	9.3	3rd
6 – 8km	5	0	0	1	2	0	0	0	2	0	1	11	1.8	4th
9 – 10km	1	2	0	0	1	0	0	0	0	0	0	4	0.6	5th
Above 10	0	0	0	0	3	0	0	0	0	0	0	3	0.5	6th
Total	28	66	69	51	29	82	62	71	74	23	60	615	100	

Source: **A**uthors' Analysis (2024).

The results presented in Table 3 show that water supply in the sampled communities is inadequate as recorded by 361 representing 58.3 percent of the respondents. 156 or 25.2 percent say it is adequate while 76 or 12.3 percent of the respondents are of the opinion that water supply in their community is moderately adequate. Those that say it is highly adequate account for the lowest proportion of 4.2 percent of the respondents in the series.

Viewing the data from each LGA, 52.1 percent of the respondents in Onuimo LGA reported that the water supply is inadequate in their communities while 29.6 percent says it is adequate. In Nwangele LGA, 55.9 percent say the water supply is inadequate and 28.6 percent say it is fairly adequate. 47.8 percent of the respondents in Ezinihitte say the water supply is inadequate while 34.8 percent say it is fairly adequate. It is very clear from the foregoing that water supply in the sampled communities in the study area is inadequate as affirmed by a highest frequency for inadequacy recorded in all the sampled LGAs. What this means is that, with water as an index of rural development, all communities in rural areas of Imo State have a low score.

Table 3: Rating of Water Supply Adequacy in the Sampled LGAs, Imo State

| Rating | Frequency | | | | | | | | | | | Total | % |
| | Okigwe Zone | | | Orlu Zone | | | | | Owerri Zone | | | | |
	Eh	Is	On	Id	Nj	Ng	Oh	Ou	Ab	Ez	Mb		
Inadequate	9	44	37	49	15	47	23	60	32	11	34	361	58.3
Fairly adequate	4	17	21	2	10	24	21	6	20	8	23	156	25.2
Moderately adequate	9	3	11	0	5	9	16	4	15	3	1	76	12.3
Highly adequate	2	2	2	0	0	4	4	1	8	1	2	26	4.2
Total	24	66	71	51	30	84	64	71	75	23	60	619	100

Source: **A**uthors' Analysis (2024).

3.3. Assessments of the Amount of Money Spent on Rural Water Supply

The perceived amounts of money spent by respondents on household water supply are descriptively explored and the results presented in Table 4 show variations across LGAs and geopolitical zones. Contextually, the results reveal that 107 out of 617 respondents representing 17.3 percent pay nothing for water in a day. A total of 298 or 48.3 percent spends ₦50 – ₦100 for water in a day. Those that spend ₦150 – ₦200 account for 22.7 percent of the respondents while 7.0 percent of the respondents agree that they pay ₦250 – ₦300 for water in a day, while 4.7 percent of the respondents spend more than ₦350 on water supply in a day.

Table 4: Analyses of Daily Amount of Money Spent on Household Water Supply

Amount (₦)	Frequency											Total	%	Rank
	Okigwe Zone			Orlu Zone					Owerri Zone					
	Eh	Is	On	Id	Nj	Ng	Oh	Ou	Ab	Ez	Mb			
Free	0	7	11	5	6	19	35	6	11	0	7	107	17	2nd
50 – 100	18	45	43	15	14	33	17	32	38	17	26	298	48	1st
150 – 200	4	8	12	25	5	21	5	17	16	5	22	140	23	3rd
250 – 300	0	0	1	6	2	7	3	13	7	0	4	43	7	4th
350 – 400	2	1	1	0	0	3	1	2	2	0	1	13	2	6th
above 400	5	3	0	0	3	1	1	1	1	1	0	16	3	5th
Total	29	64	68	51	30	84	62	71	75	23	60	617	100	

Source: **A**uthors' Analysis (2024).

In Ehime Mbano 62.1 percent of the respondents spend ₦50 – ₦100 while 17.2 percent spend more than ₦450 for water in a day. In Ideato South, 29.4 percent claims to pay ₦50 – ₦100 and 49 percent of the respondents opine that they pay ₦150 – ₦200 for water in a day. A total of 35 out of 62 respondents, representing 56.5 percent in Ohaji/ Egbema pay nothing for water in a day. The possible explanation for this could be the presence of hand pumps in each sampled community in the LGA. However, 43.3 percent of the respondents in Mbaitoli pays ₦50 – ₦100 for water in a day while 36.7 percent pay ₦150 – ₦200 for water in a day.

From the result, the amount spent on water in each sampled community ranges from ₦50 – ₦200 in a day. The 17.3 percent respondents that pay nothing for water, could be from communities that have functional hand pumps/or boreholes in their environs. The disparities in the amount of money spent on rural water supply affirmed Onyebande [9] notion that water supply services, where they exist, are unreliable and of low quality and are not sustainable because of inefficient management, poor operation and pricing and failure to recover costs. Thus, the amount spent on water supply in a day could be said to be on the high side and this may affect the quantity of water that the respondents use for domestic purposes.

3.4. Examination of the Contributions of Water Supply to Sustainable Rural Development

In elucidating the contributions of water supply to sustainable of rural communities in Imo State, data were analyzed and the results presented in Table 5 and Table 6 depicts disparities across the sampled Local Government Areas of Imo State. The greatest contribution of water supply to the development of communities in the sampled LGAs is that water supply has helped to improve the standard of living of the people by enhancing the quality of water supply for their domestic purposes as indicated by 187 or 30.7 percent of the respondents in the series.

On the contrary, 162 respondents representing 26.6 percent say the presence of improved source of water such as boreholes and hand pumps has helped in reducing the incidence of water borne diseases such as cholera and dysentery. Only 0.8 percent of the respondents indicated attraction of

manufacturing industries to the area as the contribution of water supply to the development of communities in the study areas. The patterns in the results collaborated Umo et al. [4] report that the quality and quantity of water across distinct geographical spaces differ. Such situation can play a constraining role in people safety, water access and utilizations.

In Onuimo LGA 34.3 percent of the respondents indicated reduction in water borne diseases, while 25.4 percent says the provision of good source of water for domestic purposes is the main contribution of water supply to the development of the communities. A total of 15 out of 62 or 24.2 percent of respondents in Ohaji/ Egbema indicated reduction of water borne diseases and 41.9 percent says it also provides good source of water for domestic purposes.

The Ideato South is the only local government area where 72 percent of the respondents reported that water supply has not made any impact on the development of their communities. From the data, it is clear that improved source of water for domestic purposes, which consequently leads to reduction in water borne disease, is the main contribution of water supply to rural development.

Table 5: Contributions of water supply to Sustainable Rural Development

Contribution Of Water	Frequency												
	Okigwe Zone			Orlu Zone					Owerri Zone				
	Eh	Is	On	Id	Nj	Ng	Oh	Ou	Ab	Ez	Mb	Tot	%
reducing water-borne diseases	9	17	23	2	6	24	15	14	21	8	23	162	26.6
Attracting industries	0	1	1	0	0	0	1	1	1	0	0	5	0.8
good water for domestic uses	9	24	17	4	13	24	26	25	23	10	12	187	30.7
All of the above	3	17	10	8	7	16	11	11	20	4	6	113	18.6
None of the above	7	5	16	36	4	19	9	19	9	1	17	142	23.3
Total	28	64	67	50	30	83	62	70	74	23	58	609	100

Source: Authors' Analysis (2024).

To determine the interrelationship between rural water supply and infrastructure that stimulate rural development, data generated were analyzed in Table 6 using correlation model. From the results, the contribution of water supply gives a high positive correlation coefficient of 0.901 which symbolizing that the level of rural development increases as the independent variable (water supply) increases. Therefore, to facilitate rapid and sustainable rural development, adequate and people-oriented strategies must be adopted to accelerate the provision of potable water supply in three geopolitical zones of the State.

Table 6: Correlation Model of Relationships between Water Supply and Rural Infrastructure

Pearson Correlation Model	Water Supply	Power Supply	Road Network	Industries	Security
Level of Development	0.901	0.835	0.849	0.925	0.843
Condition of Primary Schools	0.733	0.606	0.784	0.824	0.790
Condition of Secondary Schools	0.762	0.674	0.850	0.881	0.855
Condition of Community Schools	0.798	0.706	0.913	0.877	0.903
Condition of Private Schools	0.748	0.645	0.852	0.865	0.854
Condition of Health Facilities	0.771	0.646	0.887	0.795	0.892
Contribution of Water Supply	1.000	0.824	0.827	0.858	0.866
Effect of Power Supply	0.824	1.000	0.643	0.740	0.704
Effect of Road Infrastructure	0.827	0.643	1.000	0.909	0.928
Contribution of Industries	0.858	0.740	0.909	1.000	0.892

Source: **A**uthors' Analysis (2024).

The student's test was used to test whether there is no significant relationship between water supply and development among communities in the LGAs of Imo State. The calculated T-statistic gives a very high value of 367.696 at 95 percent significance level, while the critical value was found to be 1.645. Since the statistic is greater than the critical value, the null hypothesis was rejected. It was therefore affirmed that there is a significant relationship between development and water supply among rural communities in the study area. This finding is in line with the works of Gana [21] and Omofonwan [22] observations that the presence of portable (pipe born) water scheme is a measure of level of development and their absence is one of the main causes of rural-urban migration.

4.0. Conclusion and Recommendations

In the preceding discourses, this study establishes that most rural communities in Imo State do not have access to portable public water supply, they depend on water from hand pumps and mainly boreholes built by private individual. Other sources indicated by the respondents are tankers, streams/rivers and wells which are susceptible to water borne diseases. In context of space-distant-accessibility, this indicates that most households cover more than 3 kilometers in search of water for domestic uses.

In a perspective, the household expenditure on daily water supplies varies on the range of between ₦50 and ₦200 in a day, but generally adjudged as very high. The perceived high cost affected both the quality and quantity of water that the respondents use for domestic purposes. This study establishes that there are inadequate functional pipe-born water schemes in all the sampled communities which are indicator of low level of rural development. The established scarcity is a direct constraint to sustainable development of rural communities, especially when considering the central importance of water for sanitation and hygiene to the actualization of the United Nation Sustainable Development Goal.

In another dimension, this study found that though few rural communities still have relict of public water facilities that dates back to over forty (40) years, the level of maintenance culture are generally very low, almost at the zero. The poor maintenance culture also act as a factor constraining government, communities, and individuals efforts in supplying clean, safe, and hygienic water to serve as a catalyst to the sustainable development of the rural areas.

The inferential model of the contribution of rural water supply to sustainability in the development of distinct infrastructure offers the generalized positive high correlation coefficients at 95 percent confidence level each. The positive high correlation coefficients symbolize that level of sustainable rural development increases with increase in water supply. The exhibited patterns justify the need to adopt accelerated and sustainable rural people-oriented strategies in the provision of potable public water supply in the three geopolitical zones of the State.

This study recommends for:
(a) the immediate collaborative efforts by government, non-profit organizations, donor agencies, community, and individual to intensify the sustainable supply of clean, safe, and hygienic water to rural residents in Imo State to ameliorate their sufferings.
(b) proactive steps should be taken to install appropriate water storage and supply facilities and well as appropriate maintenance of the available water infrastructure by government and other stakeholders. Such action will boost the multiplier effect of distinct sectorial development of the rural communities in Imo State and aid the actualization of the water, hygiene, sanitation and agricultural components of the United Nation Sustainable development goal.

Competing Interest
The authors had declared that no conflicting interest existed regarding this paper.

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