



Spatial Analysis of the Distribution of Pre-Schools in Port Harcourt Municipality, Rivers State Nigeria

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DOI : <https://doi.org/10.55248/genepi.5.1224.250135>

ABSTRACT

Pre-primary education which is referred to as pre-school education comprises all forms of organized instruction given to children before they enroll for primary education. The distribution in relation to location tends to have significant impacts in accessibility especially in neighbourhoods in developing countries or regions. This study used the survey method with descriptive quantitative approach in collection, analysis and presentation of data.

Data were collected by primary and secondary means. Primary data were collected by the application of Global Positioning System (GPS) and were integrated in to the Geographic Information System (GIS) environment. A high resolution Satellite Imagery of the study area was acquired using Google Earth Pro and UTM Geo. Map engine. The image was imported in to QGIS environment then projected to Geographical Coordinate System by World Geodetic System (WGS 1984); Geo-referenced and subset. Information presented in tables and maps. Purposively, thematic 2kilometer radius map and nearest neighborhood index via spss to determine the distance between the pre-schools as well as pattern of the distribution were employed.

Key Words: Pre-school, Spatial, Analysis and Distribution

1.0 Introduction

Physical access to social facilities by households is directly related to locational factors such as distance, time and cost. These are the most important parameters in measuring the spatial accessibility. The best manipulation of these factors in turn optimizes the efficient and effective use of social facilities in relation to access. In this regards, educational infrastructure which are subsets of social infrastructure have been identified as a major indicators of human capital formation of a country or region leading to determination of its future rate of growth as a measure of development (Hanmer, 1998). United Nations Educational Scientific and Cultural Organization-UNESCO (2006) affirmed that the growth of education is essential to the development of economy around the world.

In implicit, developments in a developing country like Nigeria will be retarded without a well-articulated educational system that would eliminate illiteracy and in this direction human and material resources remain an effective tool to facilitation of development through education (Inobeme & Ayanwale, 2009). In assessment of this, Ikpasaja (2014) observed that the government has not taken into account inequalities existing among regions, social groups and geographical areas in the distribution of basic education schools in Nigeria. He emphasized the utmost importance of physical access to educational facilities as to strengthen the role of education in nation building. Poor access will have negative effects on students enrollment and otherwise; positive enrollment. It is in this regard (Obasi, 2019) asserted that proper spatial distribution of schools is vital to enhance access and increase school enrollment for national growth and development.

However, this study focuses on the spatial distribution of pre-school (crèche)/nursery education Port Harcourt Local Government Area (PHALGA). Pre-primary education which is also referred to as pre-school education comprises all forms of organized instruction given to children before they enroll for primary education. Mallinson (1975) identifies three basic divisions of early childhood education to include. Day-Care centers which takes care of children of working mothers who may be as young as less than 6 months, nursery which trains children to develop their manipulative audio, linguistic and aesthetic abilities through play and to become social beings by learning to interact with other children and kindergarten school which prepares children for entry and effective participating in primary education. Hence, there is the need for productive and well organized learning offered by good pre-primary school in the country.

1.1 Aim:

is to determine the spatial distribution of pre-school educational facilities in Port Harcourt Municipality as to enhance accessibility.

1.2 Objectives are:

- Determine the number of pre-schools in Port Harcourt Municipality
- Define the physical location of the pre-schools in Port Harcourt Municipality
- Determine the distance between existing pre-schools in Port Harcourt municipality
- Develop an analogue model for pre-school in Port Harcourt Municipality

2.0 Issues

Port Harcourt municipality is an urbanizing town with over 152, 000 people within Rumuparali, Elekahia, Nkpolu-Oroworokwo, Abuloma, Nkpogu, Fimie-Ama, Orogbum, Ogbunabali, Bundu, Borikiri, Orominke, Ochiri, Nembe Waterside, Ozuboko, Okuru-Ama, Azuabie-Ama, Orije, Old GRA, PH Township, Ishmael Orupabo, Mgbundukwu, Otumuonyo, Somiari-Ama, Ukukalama and Oromerezingbu communities (see, fig.1) and proper distribution of pre-schools will attach the right value its growth and development. However, pre-education facilities in municipality are indiscriminately located. Duze (2010) noted that many schools are situated around noisy areas and vulnerable to traffic accidents on the adjacent of main roads. Some of these schools are located on steep slope and rigid areas while others are concentrated only in the centre of the town outside residential clusters of students. Schools need good environment for effective learning outcomes. Hence, schools need to be located on fitting location; these fitting locations should also be the most advantageous and economical to the public in terms of accessibility. Observation depicts some pre-schools in the study area had been established without consideration to town planning standards and are mostly outside guaranteed access. Lack of map showing the distribution pattern of the schools in the study area has made it very difficult for town planners and policy makers to see at a glance how these schools are spread. Hence this study aimed to determine the spatial locations and distribution of daycares and pre-schools in the study area with a view to ascertain the locational standards of daycare and preschools in the study area and compare it with the planning standards and to determine the level of accessibility within existing schools.

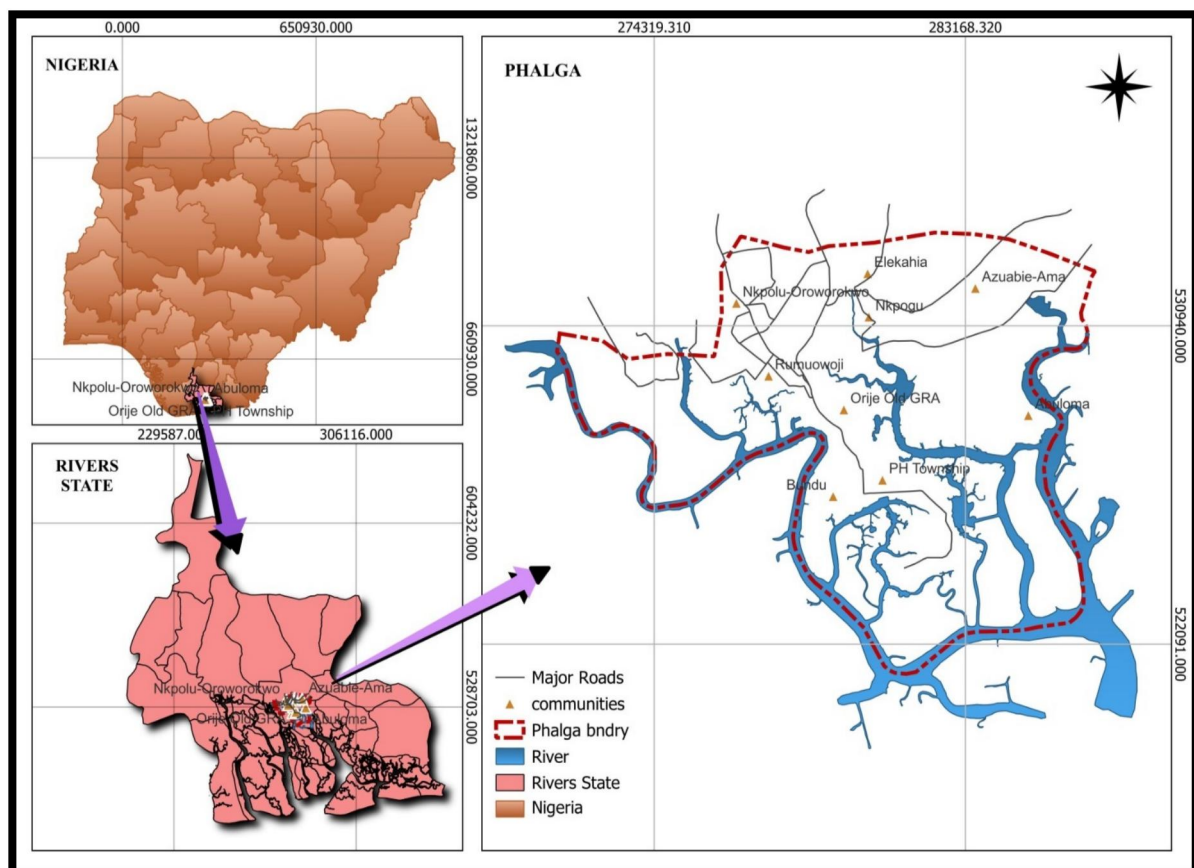


Fig. 1 map showing the study area

Source: Goggle Downloads Digitized by Researchers, 2024

3.0 Literature Review

Afe (1992) traced pre-primary education back to the colonial days. 'Such institutions were few and for the children of colonial officers. The expatriate staff in the then big colonial establishments in Nigeria opened nursery schools for their children' However, it was noted that Pre-primary schools came into existence much later in some major Nigerian cities like Lagos, Ibadan, Zaria and Aba in Abia State. In the case of Aba, the foremost was Prince Day Nursery school, Eziukwu established in 1964 to provide nursery education for the children (aged 3 – 5 years) of the emergent Nigerian cities Sule, Abdullahi and Bungwon (2012) found that private primary school locations in Kaduna metropolis were not evenly distributed as some areas have the schools concentrated at particular places while some areas have none and others have no excess. These findings were supported by Geographical Positioning System (GPS), thematic map, Nearest Neighbourhood and Buffer zone analysis. Aliyu (2013) depicted that in Adamawa state schools were randomly distributed exists within residential areas. In contrast, Ahmed et al (2013) asserted that the pattern of distribution of Police Stations in Kano Metropolis is generally random and uneven, with a little clustering at the center. One and two kilometre buffer zones were generated and the result shows that the old city of Kano and the eastern part of the metropolis were fully served while the west and southern part were underserved. Similarly, Kibon and Ahmed (2013) affirmed that distributions of Health facilities in Kano metropolis are in clustered pattern.

Olubadewo, Abdulkarim and Ahmed (2013) opined that the use of technology (GIS) for education planning have proved to be very important in the decision making, in Fagge L.G.A by providing the planners integrated geographic scenario of location of school. The Thematic map and Nearest Neighbourhood analysis shows that the distribution of primary schools in the area is more concentrated than other areas, while the buffer zones show that schools are closer to roads and Markets. The database shows there are 222 classrooms, 12,693 pupils and 558 teachers in the areas at which the result shows a perfect significant relationship between the number of teacher and pupils. The tool of the analysis (Nearest Neighbourhood) was used to analyze the pattern of the distribution and the result shows the schools are dispersed

Several studies have been conducted on the spatial distribution of schools. This section reviews empirical studies conducted on this field of studies. Tijjani Abdulaziz Mahmud (2014) conducted a study on Analysis on The Spatial Distribution of Public Primary Schools in Tarauni Local Government Area, Kano State, Nigeria. The study seeks to analyze the spatial distribution of public primary schools in Tarauni Local Government Area with a view to aid planning and decision making. The results from the study shows the disperse pattern of distribution (3.25) exist and service radius (catchment area) of 2km within the study area. All the public primary schools did not meet with the UNESCO standard (1996) in terms of location of education infrastructure. This implies that access to basic education facility has been identified as a major indicator of human capital formation of a country or region, which is an important determinant of its future rate of growth and as a measure of development. Even spatial distribution of schools is vital to enhance access.

4.0 Methodology:

This study used the survey method with descriptive quantitative approach in collection, analysis and presentation of data. Data were collected by primary and secondary means. Primary data were collected by the application of Global Positioning System (GPS) and were integrated in to the Geographic Information System (GIS) environment. A high resolution Satellite Imagery of the study area was acquired using Google Earth Pro and UTM Geo. Map engine. The image was imported in to QGIS environment; projected to Geographical Coordinate System by World Geodetic System (WGS 1984); Geo-referenced and subset. Information presented in tables and maps. Purposively, thematic 2kilometer radius map and nearest neighborhood index via spss to determine the distance between the pre-schools as well as pattern of the distribution were employed.

4.0 Data:

4.1 Attribute Data on the location of Existing Pre-schools in the Study Area

Table 1 shows the locations of existing pre-school in the study area based on the coordinates. It was found that a total of 17 pre-school exist in the three communities (see fig. 1 and 2).

Table 1: The Locations of Existing Pre-schools in the Study Area

S/N	SCHOOLS	LOCATION	PROJECTED COORDINATES	
1	Divine-Steps International School	Opp. Obaziolu st. Mile 3, diobu	44749.73	65926.97
2	Model Primary School	Nkpolu, Ikwere Road	44819.26	65926.97
3	Child-De-Excellence Group of Schools	Osina lane, Mile 3 diobu	44745.67	6593.17
4	Randolph Comprehensive College	Mile 2, Iloabuchi	44726.39	65920.6
5	Saint Anthony School	Sangana	44742.96	65958.72

6	Midtown Schools	Rumuwoji street	44729.15	65940.92
7	Faithful Model School	Brass street	4472.21	65931.15
8	Chokmah Internatinal Academy	Wogu street, D-line	44820.6	70009.2
9	Sure Foundation Group of Schools	Abel jumbo street, Mile 2	444747.8	65929
10	Ojims School	Ihuoma street	4.800282	7.002541
11	Rivers State University Staff School	Nkpolu Oroworukwo		
12	Sit-up International School	33 Egede Street, MILE II	4.799813	6.990045
13	Living Seed INTL School		4.790678	6.989063
14	Christ the King Nursery and Primary School	MILE II	4.791571	7,000,845
15	Jedon Heights School			
16	Immaculate Heart			
17	St. Thomas School			

Source: Researchers' Field Survey, (2024)

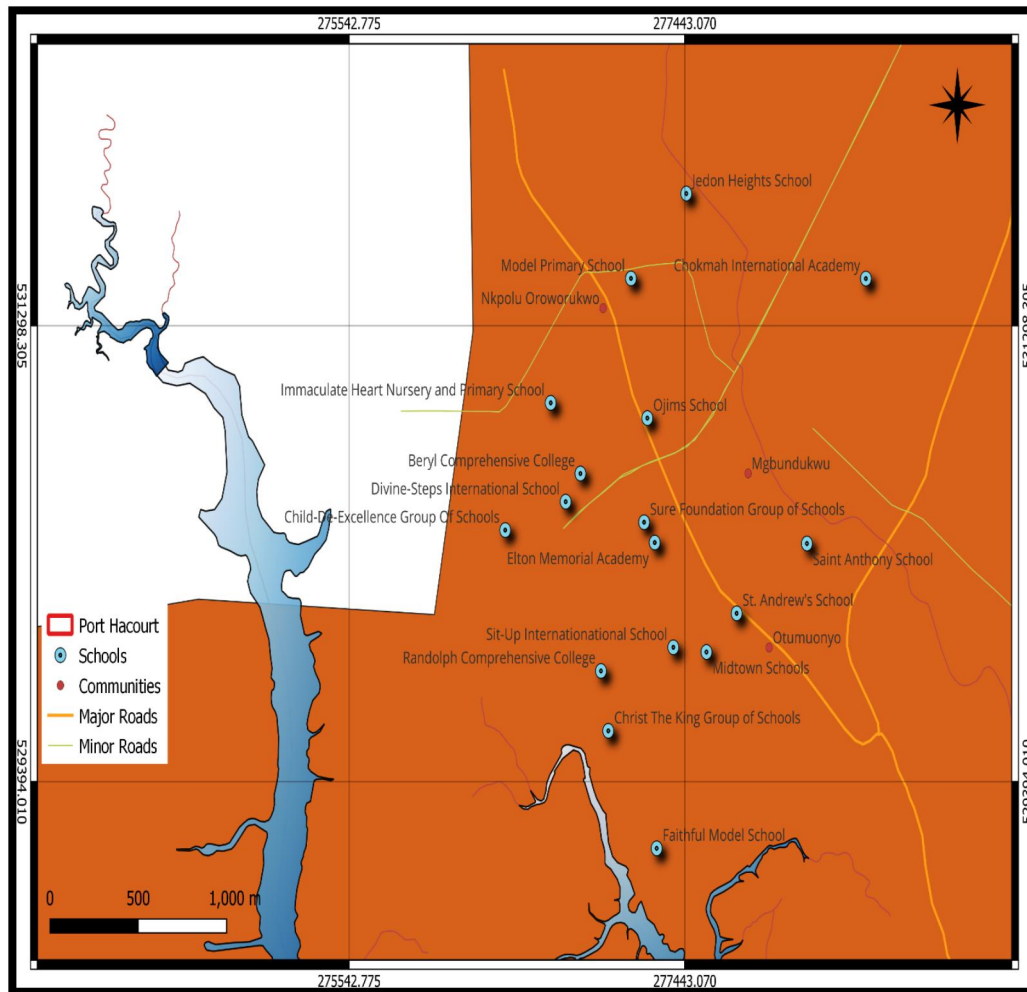


Fig. 2: The location and distribution of preschools within Community Boundaries Defined by Major Roads

Source: Researchers' Field Survey, 2024.

4.2 Determined Distances between Existing Preschools

The results from Average Nearest Neighbourhood Distance depicts the nearest neighbour as (1.34481737806), the observed mean distance to be (28775.26181863314), the expected mean distance to be (21397.1519766209), the number of points as (17) representing the number of schools and the Z-Score index (2.71984709076) is within the critical values (-1.65 to +1.65) the pattern does not appear to be significantly different than dispersed. As shown in table 3.

Table 3: Average Nearest Neighbourhood Analysis of Existing Preschools in Communities

Observed mean distance	28775.26181863314
Expected mean distance	21397.1519766209
Nearest Neighbor Index	1.34481737806
Number Of points	17
Z-score	2.71984709076

Source: Researchers' survey, 2023

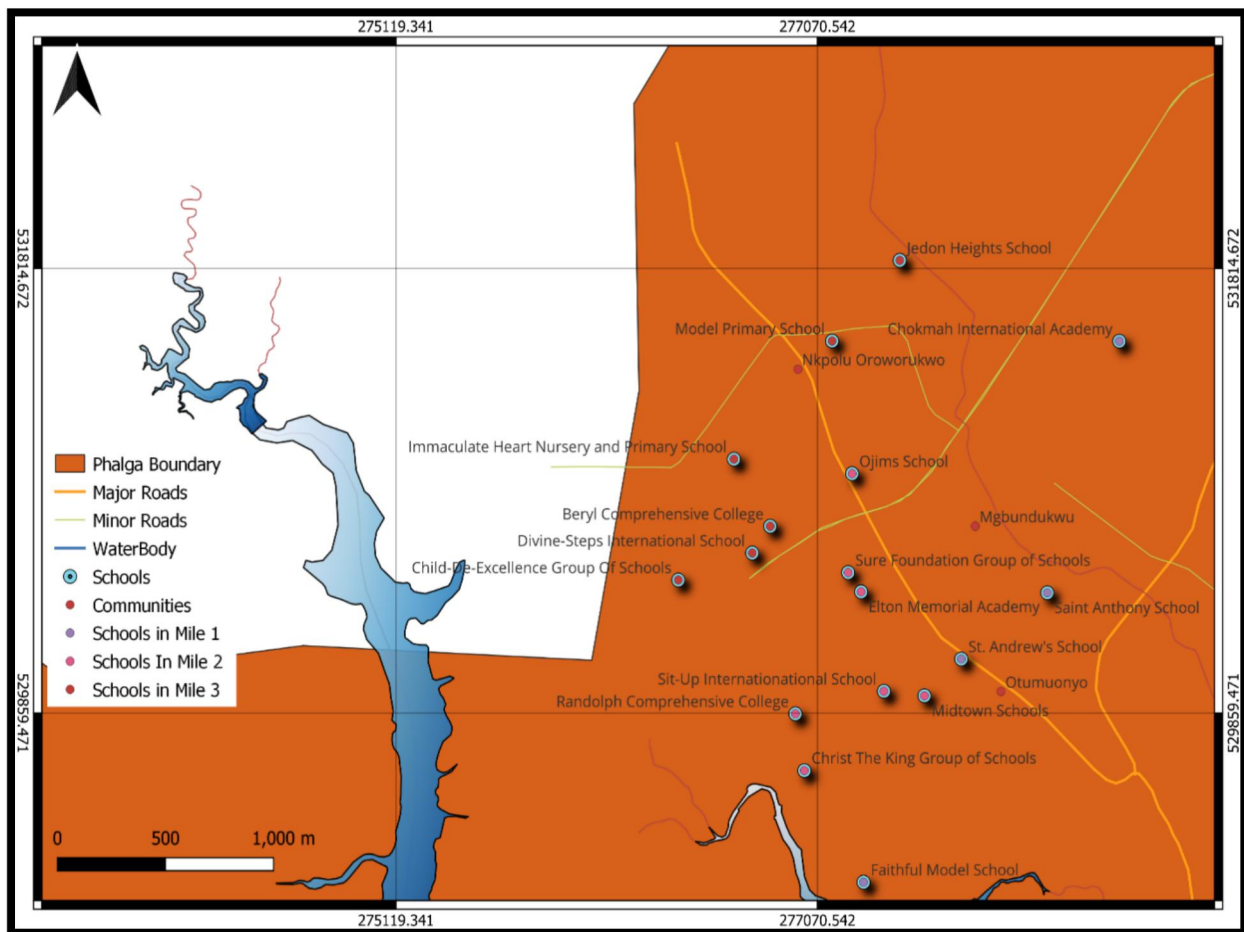


Fig. 3: The Location and Distribution of Pre-schools in the Study Area

Source: Researchers' Field survey, analysis and result 2024

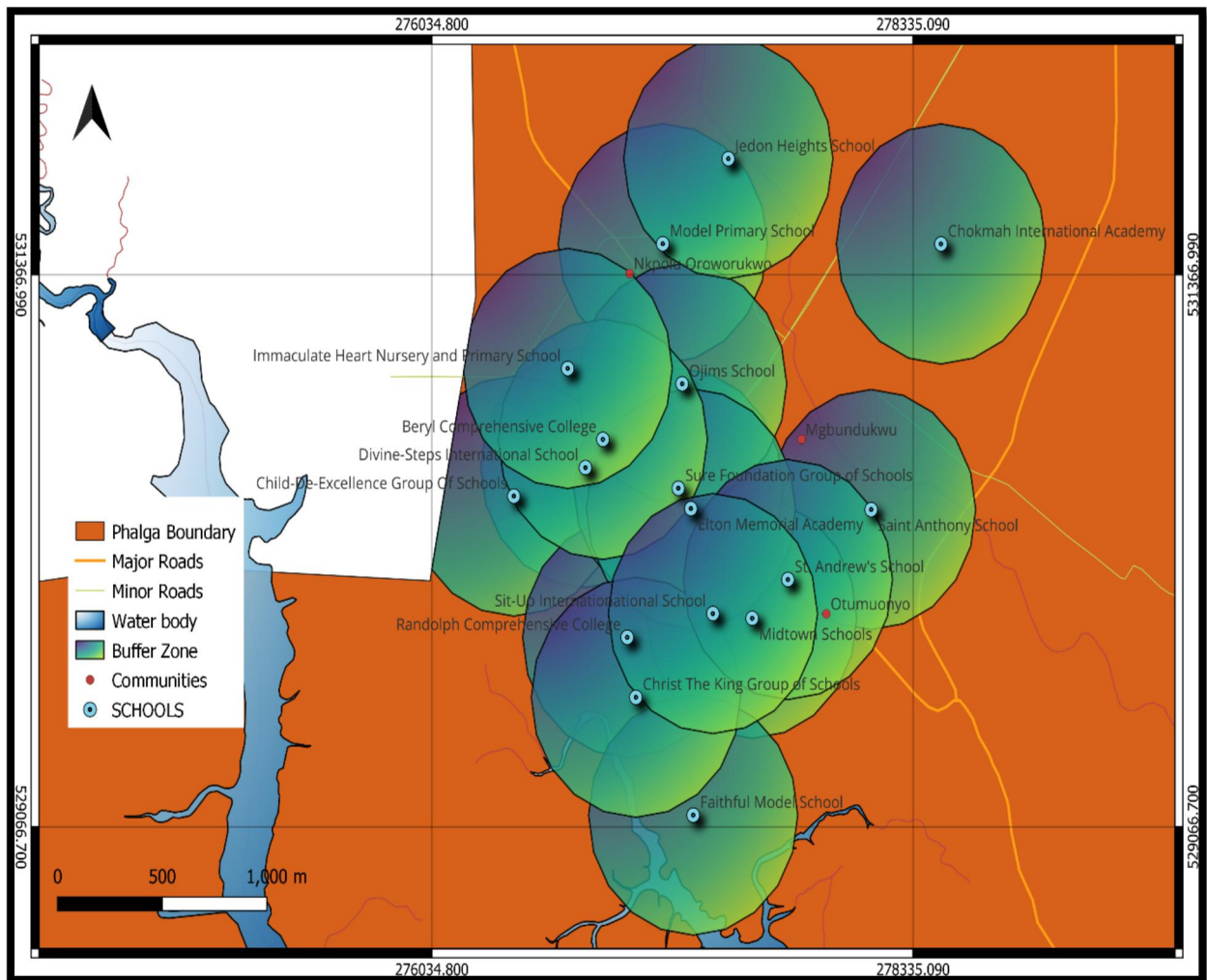


Fig. 4: observed location of pre-schools and their catchment areas based on standard

Source: Researchers' Field Survey, Analysis and Results, 2024

4.3 Observed Siting of Nursery and Pre-schools in the Study Area

Figure 4 shows the design of observed location of pre-schools in the study area based on standard of 500meters by UNESCO (1996). For areas within the study area that are not covered by the minimum radius of the above figure displaying the proportion of coverage by the buffer.

5.0 Findings and Discussions

It was found that the distribution of pre-schools pattern in the three sampled communities within the study area according to the Nearest Neighborhood Index (1.34481737806) is dispersed since the Nearest Neighborhood ratio is greater than 1. This could be due to the fact that the schools are built around human settlements (residential area) without consideration to planning standards. This is in tandem with Ikpasaja (2014) assertion that government has not taken into account inequalities existing among regions, social groups and geographical areas in the distribution of basic education schools in Nigeria.

In accordance, the proposed new locations for preschools with a radius serving less than 2km was presented to ensure an almost even distribution of schools in the study area (see fig. 5). Figure 5 explains buffers rings drawn around location of pre-school facilities at a specified 500 meters distance indicated the varying long and short distances between schools. This is in line with UNESCO standards (1996) the yardstick for the zoning of new schools across spaces. The physical assessment in this regard vividly certified disproportionate pattern of school facilities locations in the area.

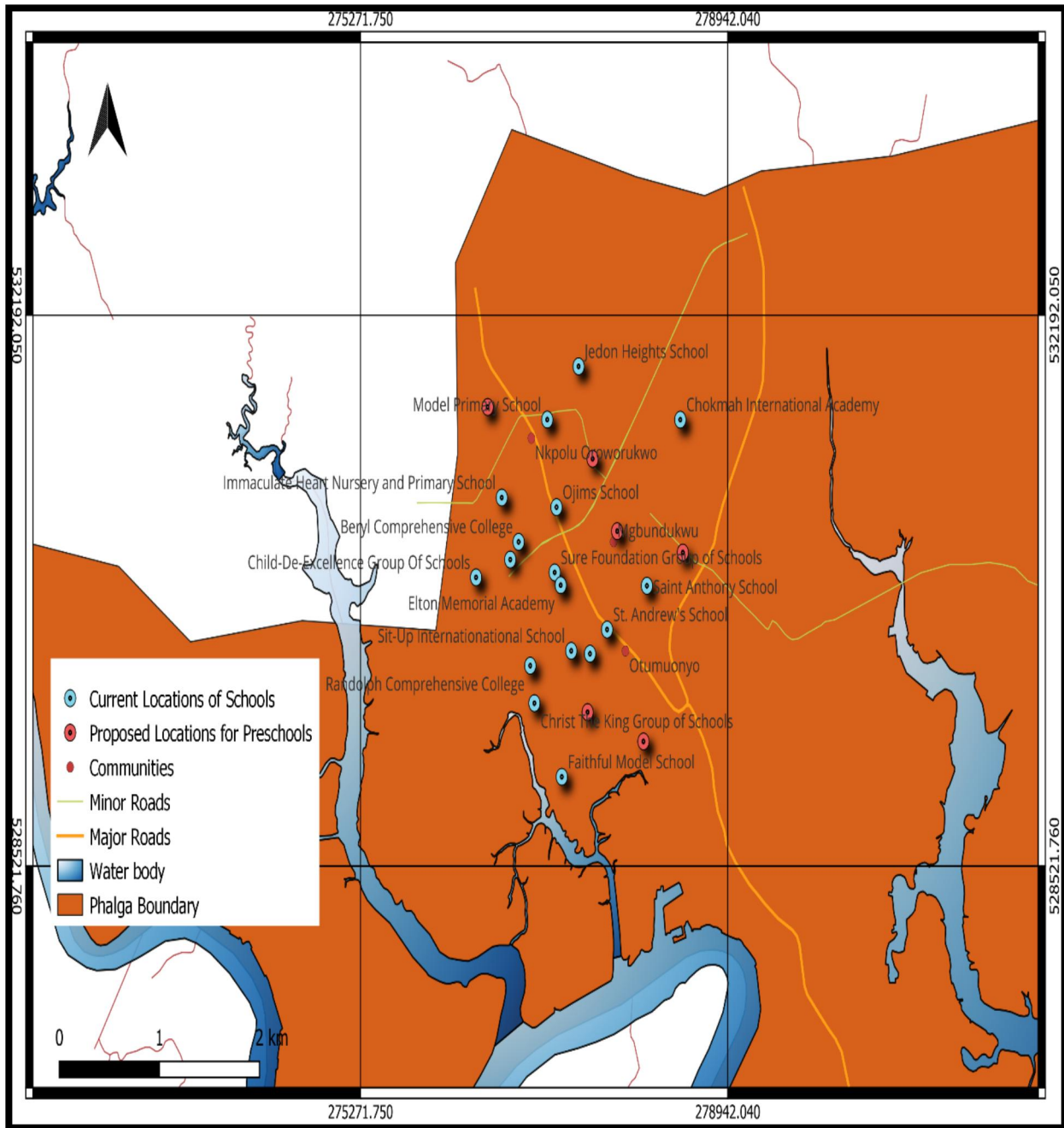


Fig.

5: Proposed Siting of Preschools in each community

Source: Researchers' Survey, 2024.

The figure 5 shows proposed locations for pre-schools in addition to the existing pre-schools in the study area.

6.0 Conclusion

The provision and the spatial distribution of preschools has been of vital importance in both developed and developing countries. The need to provide educational facilities and services for the purpose of promoting and sustaining growth and development is recognized worldwide. All over the world, pre-school education has been regarded as the most important as well as the most patronized by people. This perhaps may be due to the fact that it is the foundation of the whole educational pursuit, which is expected to provide literacy and enlightenment to the citizens. Furthermore, proper spatial distribution of schools is vital to enhance access. Distribution of schools has an effect on the participation rate and access to schools (Obasi, 2019). Ikpasaja (2014) observed that the government has not taken into account inequalities existing among regions, social groups and geographical areas in the distribution of basic education schools in Nigeria and the same inequality status with regards to access has been determined in Port Harcourt by this study.

7.0 Recommendations

Based on findings of this research, the following recommendations are suggested:

1. Government and private individuals should ensure that the construction of preschools be done with both national and international standards of school's placement.
2. Private schools should be monitored to prevent haphazard location of schools for young children in residential areas for maximum accessibility. This is a responsibility of development and plan approval agencies in the state which are mainly administered by Town planners. However, this process should be monitored by UBEC staff or consultants hired by the UBEC to ensure

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