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Neighbourhood accessibility and sustainable development in Nigeria

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Abstract

The concept of accessibility is fundamental to neighbourhood design, it is instrumental to location of services, spatial analysis and neighbourhood facilities. This study focused on Accessibility and its impact on safe access to public facilities. The research methodology followed a participatory process with the local community to identify main issues to be addressed. A priority list of actions is drafted to enhance accessibility on a neighbourhood scale: the special needs of the more vulnerable. Questionnaires were used to gather data from the respondents through a cross-sectional survey. The data were processed using inferential statistics. A proposed neighbourhood was finally designed for the respondents. The analysed data revealed that there is a significant relationship between social network and safe access to local facilities. The author advocates improved conditions for trekking, cycling and public-private participation.

Keywords: Neighbourhood Accessibility; Space Standard; Inclusive City; Nigeria

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1. Background to the study

The concept of Neighbourhood Accessibility Planning (NAP) aims at improving local conditions for walking and cycling as well as facilitating safe access to local facilities (e.g. schools, shops) and public transport. The special needs of more vulnerable groups such as the disabled, older people and children are particularly taken into account.

Neighbourhood accessibility improves conditions for walking and cycling and can contribute to better designed local bus services, create more lively neighbourhood and fosters better use of public space and social inclusion, reduce car use on short distances, enables better understanding of citizens' needs and better legitimate measures through a participatory process.

1.1. Aims of the study

The main aim of the study is to:

- Investigate impact of accessibility on safe access to local facilities and the use of public space;
- create more lively neighbourhood and foster use of public space and social inclusion;
- improve on conditions for walking and cycling.

1.2. Literature review and conceptual framework

1.2.1. Neighbourhood Accessibility

Accessibility could be used in a broad perspective as in Svensom (2007, p. 4) "since the design of our cities tends to constrain people with impairments from performing their daily activities, removing stairs and making public spaces accessible for every one is becoming a human right -issues". In this context accessibility would depend on several parameters (e.g. stairs, narrow passages and high pavement).

The concept of accessibility refers to the ease of reaching a destination. Accessibility is defined as the measured of the capacity of a location to be reached by or to reach different location. Therefore the capacity and the arrangement of transport infrastructure are key element in the determinant of accessibility. The concept of accessibility is fundamental to Neighbourhood Design. It is instrumental to location of services, spatial analysis and Neighbourhood facilities.

Space standard are land (space) specification employed to guide the use and the development of urban land for the purpose of providing adequate land for the various uses of urban land for the creation of balance urban land-use system. Space standard are of two types site and access standards, while site standards specify sizes (areas) of land, access standards specify walking or driving distance to facilities and services.

Public Bicycles are innovative schemes of rental or free bicycle in urban areas. They differ from traditional mostly leisure-oriented bicycle rental services as they provides fast and easy access and can be used for daily

mobility with one way use being possible. Public Bicycle can be seen as part of the public transport system and offer the user a highly flexible travel option for inner urban trip.

Well working Public Bicycle schemes exist in different formats and the ideas is catching up in many European countries, such as Germany, The Netherlands, France and Scandinavia countries. Recently they also started to be implemented in several cities in Nigeria. Technically simple but theft-sensitive schemes have already been implemented since the late sixties. Today's modern concepts are much more sophisticated and have diversified in organisational layout, business model and the technology applied toward "smart bikes" (rental process via smart card or mobile phone). NICHES – transport.org identified the following benefits of Public Bicycle scheme:

- it provides a fast convenient and flexible inner urban transport option;
- increase mobility choices, with low costs compare to other public transport measures;
- encourages inter-modal travelling in connection with public transport;
- it is a wise use of inner urban space e.g. when bicycle racks substitute parking places for cars;
- also makes sense in cities that have a good level of cycling as it adds a valuable element to existing mobility services;
- can be a "door opener" to increase the acceptance of cycling as a valuable urban transport mode in cities that still lack a good level of bicycle use.

1.3. Neighbourhood

A neighbourhood is the minimum unit desirable for the development of residential areas "--- it is the area within which residents may all share the common services, social activities and facilities required in the vicinity of the dwellings". The population of neighbourhood vary from 2000 to 5000 requiring land area of 20 to 100 hectares, the density of development being the primary determining factor. The maximum radii of centrally located facilities and services is 800 metres that is 0.8 kilometres. Table 1: Then the maximum land areas for the neighbourhood population of 8000 is 200 hectares (Obateru, 2003).

Table 1. Neighbourhood Area and its Service Radius

Approximate Area (hectares)	Service Radius (m)
200	800
155	700
115	600
80	500

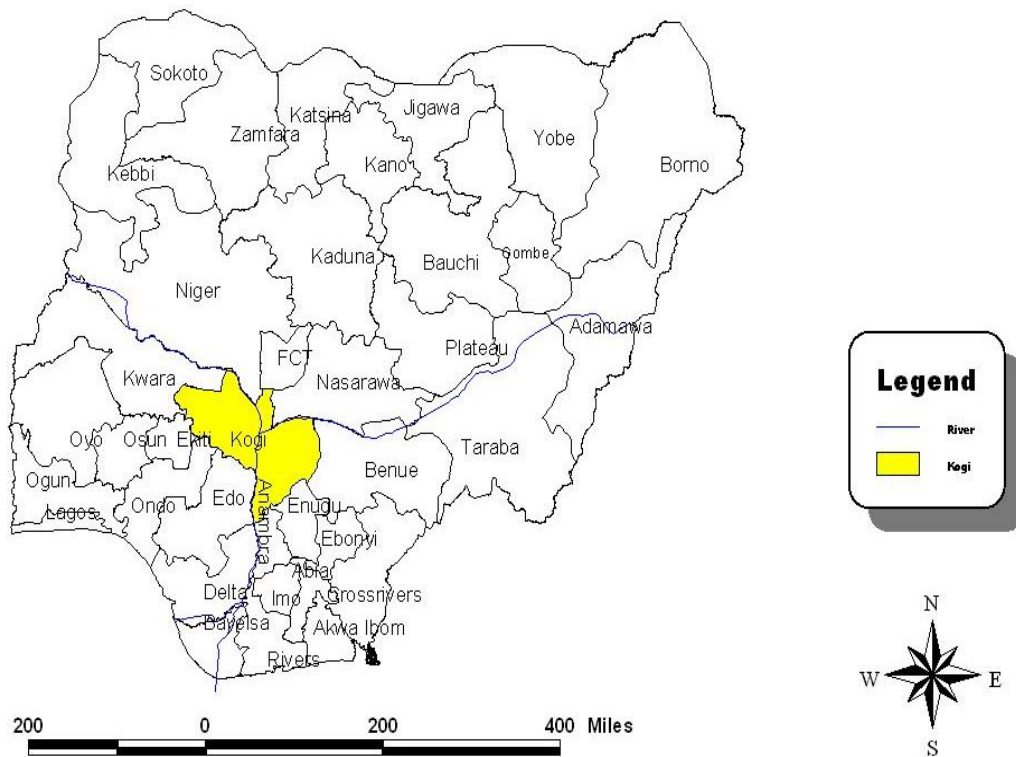
50	400
28	300
13	200
3	100

Source: Adapted from Obateru, O.I. (2003)

Because of the prime position of residential land use in the city, and the fact that “the existence of a unified neighbourhood is a strong force for the stability and development of individual and family life.

2. Study area

Lokoja the First British settlement in the Northern Part of Nigeria is situated at the meeting point of the River Niger and Benue where they form a confluence and make a Southward turn in their journey to the Atlantic Ocean about 547 kilometers.



Source: Kogi State Ministry of environment and Physical Development,2000.

Figure 1. Map of Nigeria Showing Kogi State

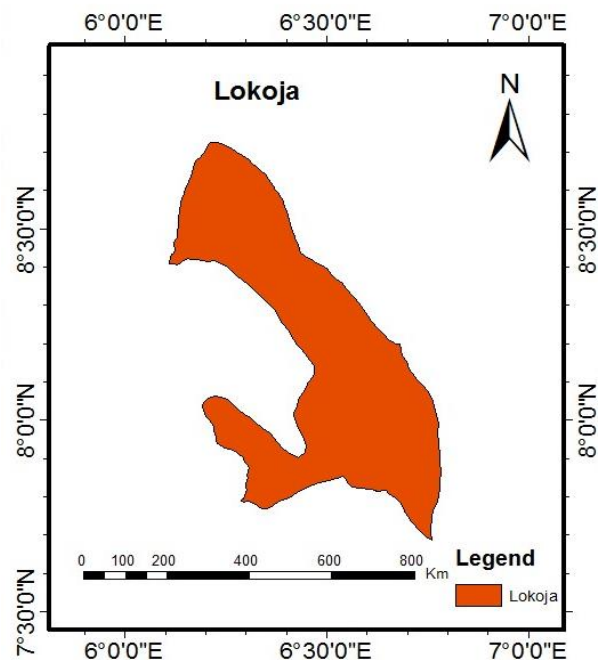


Figure 3. Map of Lokoja

3. Research methodology

The research methodology follows a participatory process with the local community to identify main issues to be addressed. A priority list of action is drafted to enhance accessibility on a neighbourhood scale. The special needs of more vulnerable groups such as the disabled, older people and children are particularly taken into account across sectional survey was adopted. Questionnaire instrument was used to gather data.

3.1. Sample frame and size

The population of the studies was a neighbourhood of 2000 people out of which two hundred people was sampled using systematic random sampling technique.

3.2. Data processing

The data was process using both descriptive statistics. Chi-square was used to test hypothesis.

4. Result and discussion

This chapter deals with the presentation and analysis of data that were collected from 200 respondents. The analysis is as presented below:

4.1. Presentation and analysis of data and test of hypotheses

Table 4.1. Frequency Distribution of the Sample of Responses Showing Gender of Participants

Responses	No. of Respondents	Percentage
Male	105	53%
Female	95	47%
Total	200	100

Source: Field Survey, 2017

Table 4.1 indicates that 105 (53 percent) of the respondents were male and the remaining 95 (47 percent) were female. This shows that majority of the respondents were male.

Table 4.2. Frequency Distribution of the Sample of Responses Showing Age of Respondents

Responses	No. of Respondents	Percentage
10 – 20 years	118	59%
21 – 30 years	43	22%
31 – 40 years	24	12%
41 years and above	15	7%
Total	200	100

Source: Field Survey, 2017

Table 4.2 indicates that 59 percent of the respondents were between the age of 10-20 years. 22 percent were between the age of 21-30 years. 12 percent were between the age of 31-40 years. 7 percent were between the age of 41 years and above.

Table 4.3. Frequency Distribution of the Sample of Responses Showing Status of Respondents

Status	No. of Respondents	Percentage
Married	154	77%

Single	33	17%
Divorce	6	3%
Widow	7	3%
Total	200	100

Source: Field Survey, 2017

Table 4.3 indicates that 77 percent of the respondents were married. 17 percent were single, 3 percent were divorce and the remaining 3 percent were widow.

Table 4.4. Frequency Distribution of the Sample of Responses Showing Remuneration or Income of Respondents

Remuneration	No. of Respondents	Percentage
Satisfactory	148	74
Not satisfactory	52	26
Total	200	100

Source: Field Survey, 2017

Table 4.4 indicates that 74 percent of the respondents were satisfactory with their remuneration and the remaining 26 percent were not satisfactory with their remuneration.

Table 4.5. Frequency Distribution of the Sample of Responses Showing Working Experience of Respondents

Working Experience	No. of Respondents	Percentage
1 - 5 years	140	70%
6 - 10 years	17	9%
11 - 15 years	13	6%
16 years and above	30	15%
Total	200	100

Source: Field Survey, 2017

Table 4.5 indicates that 70 percent of the respondents have 1-5 years working experience. 9 percent have 6-10 years working experience. 6 percent have 11-15 years working experience. 15 percent have 16 years and above working experience.

- Research Question 1: What are the priority needs in a neighbourhood accessibility?

Table 4.6. Participants Response on what is their priority need in a neighbourhood accessibility

S/N	ITEMS	SD	D	A	SA	MEAN	STD DEV	DECISION
		1	2	3	4			RULE (2.5)
1	Neighbourhood playground	17	27	74	82	3.1050	.93721	Accept
2	Neighbourhood shopping centre	16	31	72	79	3.3150	2.55508	Accept
3	Health centre	45	49	51	55	2.5000	2.55058	Accept
4	Accessible roads and good transportation system	20	21	90	60	3.3266	3.32405	Accept
5	Market shopping centres	25	24	75	76	3.0100	1.00246	Accept

Source Field Survey, 2018

Table 4.6 shows the mean rating of priority need in neighbourhood accessibility. The findings show the following mean rating 3.1, 3.3, 2.5, 3.3. Therefore from the analysis the researcher arrived at a priority needs in a neighbourhood and a proposed neighbourhood plan was prepared. (Figure 1)

Table 4.7. Participants Response on what is the level of extent road network does on safe access to local facilities

S/N	ITEMS	SD	D	A	SA	MEAN	STD DEV	REMARK
		1	2	3	4			
1	Accessible road network affect access to local facilities	14	23	35	28	3.1300	1.77900	

- Research Question 2: What is the relationship between the extents of road network does on safe access to local facilities?

Research question 2 has the following means score 3.1, 3.0, 3.0, 3.2 and 3.0 which shows that the respondents Agree that road network is a key determinant to neighbourhood accessibility.

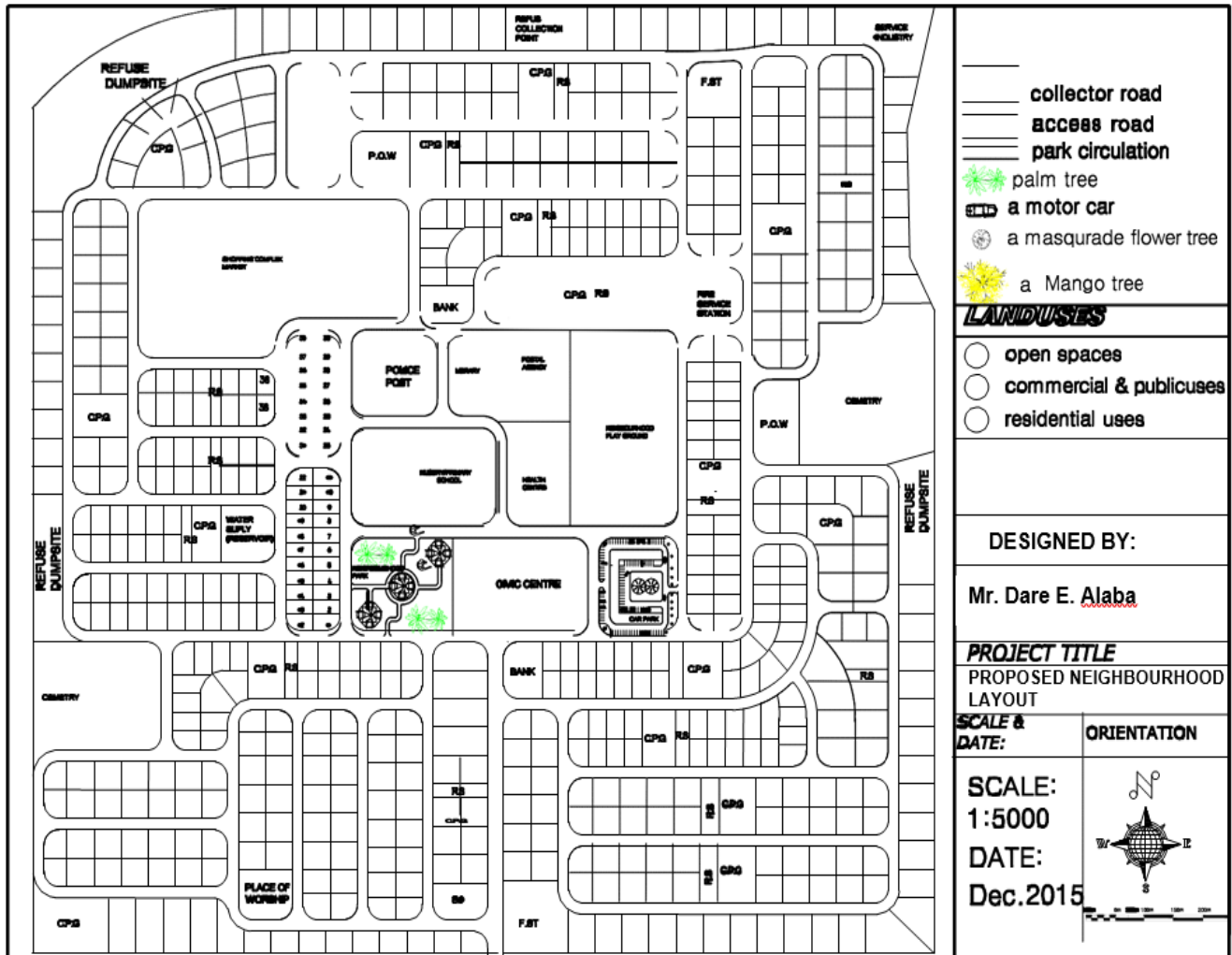
4.2. Research Hypothesis

Research hypothesis was formulated to guide study and will be tested at 0.05 level of significant.

Ho: There is no significant relationship between the accessibility and regular use of public facility.

Hi: There is a significant relationship between accessibility and regular use of public facility.

The Chi-Square Analysis of the Mean Response Score of road network and the safe access to local facilities.



4.3. Hypothesis Testing

In this section, the hypothesis associated with the study will be tested. The data already presented in this chapter will be used in testing the hypothesis.

4.4. Tools of Computation

$$\text{Using Chi-square } X^2 = \frac{\sum (O - E)^2}{E}$$

Where: O = Observed frequency

E = Expected frequency

Σ = Summation sign

Level of significance = 0.05 or 5%

Degree of freedom = (Row - 1) (Column - 1)

4.5. Decision Rule

The null hypothesis (Ho) will be rejected if the computed X^2_0 , is greater than the critical value X^2_0 , the null hypothesis (Ho) will be accepted and alternative hypothesis will be rejected.

ITEMS	SD		D		A		SA	
	O	E	O	E	O	E	O	E
1	14	12.2	23	18.2	35	32	28	37.4
2	10	12.2	28	18.2	31	32	31	37.4
3	10	12.2	15	18.2	25	32	50	37.4
4	15	12.2	13	18.2	34	32	38	37.4
5	12	12.2	12	18.2	35	32	40	37.4

Level of significance = 0.05 or 5%

Degree of freedom = (Row - 1) (Column - 1)

$$= (5 - 1) (4 - 1)$$

$$= (4) (3) = 12$$

At 12 degree of freedom. 0.05 level of significance

Tabulated chi-square (x^2) = 21.03

$$\text{Using } X^2 = \frac{\sum (O - E)^2}{E}$$

$$= 1.72 + 5.77 + 2.07 + 7.91$$

$$X^2 = 17.47$$

Since the computed X^2 of 17.47 is greater than the tabulated critical value (X^2) of 5.23, we reject the null hypothesis (H_0) and accepted the alternative hypothesis and conclude that accessibility impact positively on the use of public facilities. This corroborates NICHES – Transport.org that Neighbourhood accessibility facilitates safe access to public space.

5. Conclusion

An inclusive city with its emphasis on participatory democracy is a desirable outcome which local government must strive to attain in that effort to effectively manage rapidly growing cities all over Africa. Since the year 2000, the UN-Habitat as well as the UNDP and the World Bank have all joined in the campaign for good urban governance in both the transitional and the developing areas of the world. Fifteen years later, it is still true to say that very few African countries have committed themselves to the realization of these goals of urban governance where every citizen will have equal access to urban infrastructure and services, to better their lives in respect of gender or conditions of disabilities (Mabogunje 2005).

6. Recommendations

There should be emphasis on participatory democracy that encourages local government, to encourage various innovative strategies to ensure that they carry all their neighbourhood communities with them in major decision, about the development of the area. Such participatory is central to the City Development Strategy which each municipality is expected to initiate and implement.

Public- Private Partnership (PPP) is particularly helpful in improving efficiency in road infrastructure. There are quite a number of (PPP) schemes which are relevant to road development and maintenance. These include:

- i. Operate and maintain
- ii. Build operate and transfer
- iii. Build transfer and operate
- iv. Design and build.

Other PPP scheme that may be used in highway development include build own – operate – sell, build – lease – operate, build lease transfer, build – transfer immediately, rehabilitate – own – operate, lease – maintain – transfer and maintain/modernize – operate – own transfer.

If private participation of these type suggested is embraced, it will go a long way to save the ailing State of Nigerian roads. Pedestrian sidewalks should also be provided to guarantee smooth neighbourhood accessibility.

The major disadvantage with PPP schemes is that roads constructed and built under such scheme have to be tolled: else, the private partners cannot recover costs. It has however been shown that consumers are willing to pay for good roads conditions are directly linked to vehicle operating cost (Bhandari, 2002).

The use of technology of Geographical Information System (GIS) can also put a special spin on accessibility planning through optimal path or shortest route. This can also reduce trip.

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