

Examination of the Typology of Public Open Spaces in Lafia Town, Nasarawa State, Nigeria

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Abstract

Public open space is one of the key components in urban land use that contribute to improving the quality of life of citizens but this seems to be inadequate in most developing countries. This paper seeks to establish the types and sizes of these public open spaces in Lafia town. The study adopted field observations and direct measurements to ascertain the sizes of the public open spaces and GPS was used to take coordinates of each public open spaces. LandSat satellite images of the study area were acquired from NASRDA. This satellite image was imported into the GIS environment to locate the types of the spaces. All the images were made to pass through processes of image enhancement, Geo-referencing, re sampling, image classification and digitizing. The study revealed that there are three categories of public open spaces (civic, green and quasi-access spaces) in Lafia town with total coverage of 474,851m² constituting about 2% of the urban land use which is inadequate and also public open space per inhabitant is 1.7m² which is below WHO standard. From this study, the present public open spaces revealed significant reduction in most areas of the different typology of public open space in Lafia town. Therefore, the study recommends that community members including other urban stakeholders who are not experts in planning projects should be educated on public open space management. The study concludes that there should be enforcement compliance of land use management legislation to reduce public open space conversion and encroachment.

Keywords: *Public open space, green spaces, typology, open space classification, recreational*

1.0 INTRODUCTION

Public open spaces are an integral part in urban land use planning that are critical to the environment and contributes to improving the quality of life of citizens. Public open spaces are considered to be recreational areas, where human beings develop social relationships (Aram, 2019). They are all form of spaces such as parks, green spaces, esplanades, plots with sports and leisure facilities, and other spaces that offer opportunities for recreational activities that are widely recognized as important in creating livable cities (Zhu, Wang & Qin, 2021; Jian, Chan, Xu, & Owusu, 2021). Public open spaces can help promote healthy living for people in urban areas by providing opportunities for physical activity practices and leisure activities (Femino, Rodrigo, Pedro, and José, 2013). Public open spaces are quite important in enhancing the quality of life and

urban environment while offering social, health, environmental and economic benefits to a city and its residents. These public open spaces provide mental refreshment as well as opportunities for physical activities, such as walking, physical exercise, and leisure. The services provided by public open space are central to the well-being of the user population, providing tangible and intangible benefits (Nsution & Zahrah, 2018).

The phenomenal rise in urban population and increasing size of cities over the years has led to major changes on the physical landscape and activity system (Abdullah & Ahmad, 2020). Rojina and Sudha (2022) reported that due to rapid growth of Kathmandu valley as one of the cities of Nepal revealed that public open spaces have changed dramatically, improper management policies and encroachment. The study further added that there is inadequate community utilisation of public open spaces which has impacted the urban life of the people residing in the valley.

The importance of these public open spaces in urban life has never been emphasized enough, especially for a developing country like Nigeria. Pressures of urbanization have resulted to piecemeal development of public open spaces and continued threat of converting public open space into other uses has made them inadequate in our cities. According to Daramola and Ibem (2010), that is an increase in the demand for higher levels of development by urbanization in developing countries like Nigeria. This has led, to a large extent, the inadequate and ineffective use of public open spaces. Alabi (2009) reported that the increased demand for land has led to misuse and conversion of open spaces to illegal uses such as refuse dumps, corner shops, artisan workshops, residential buildings, squatter homes and others. It could become a security problem to people around such public open spaces as criminals and hideout.

The observation has shown that available public open spaces in Lafia town are being affected due to rapid urban growth and expansion experiencing over the past few decades. The Greater Lafia Master Plan (1998) and Lafia Development Plan (2012) shows that the declining in sizes and number of public open spaces in Lafia town is on account of high population growth. Public open spaces are being lost as a result of change of their uses; for example government has changed a holiday ground known as “Filinhutu” which was used for communal interaction, relaxation and chatting to premises of Nasarawa State Fire Service station. Some of the public open spaces are also being encroached as a result of increased demand for land by the public for various human activities thereby reducing their sizes. Many of the public open spaces designated in Lafia town were converted into non-functional use (Lafia Development Plan, 2012). Therefore, urban planning and design should take into account the importance of preserving and maintaining these spaces.

Available literature shows that in West African countries such as Ghana, Senegal and Sierra Leone, public open spaces are declining in numbers and sizes due to rapid urbanisation (UN-Habitat, 2015; Azare et al, 2018). Fewer studies are available that provide insights into the character and use of public open spaces. Studies conducted of environmental impact of public open spaces in Chennai (Sundaram, 2011), and analysis of environmental attributes of public open spaces, Pune (Budruk, et al., 2009). Such studies have been conducted in Western countries and must be considered in South Asian countries with a different cultural context.

This study sought to establish the types and sizes of public open spaces in Lafia urban area. The study of this type is imperative to assist urban planners and managers in the management of public open spaces in urban areas. The outcomes of the study will also provide a systematic classification

of use for planners and policy makers in preparing public open space strategies and in setting development plan policies.

2.0 LITERATURE REVIEW

2.1 THE CONCEPT OF PUBLIC OPEN SPACES

Public open spaces are widely studied particularly in the field of urban design, urban planning, urban management, sociology, ecology, environment, economics, urban geography, political science, anthropology etc. Public open space is often referred to by urban planners and landscape architects by the acronym 'POS'. Public can mean owned by a national or local government body or owned by 'public' body, that is, a not-for-profit organization and held in trust for the public (Madanipour, 2010). The terms 'public open space', 'open space', 'urban open space', 'green space' are used interchangeably in planning. Different scholars used different terminologies to define public open spaces and the differentiation is in terms of the space, location, development and function.

Scholars explained public open space as an outdoor area which is open to freely chosen and use for social and recreational activities (Woolley, 2003). Public open space is "spaces within the urban environment that are readily and freely accessible to the public and are intended primarily for comfort or recreation purposes whether active or passive" (National Heart Foundation of Australia, 2014, p. 35). Jalaladdini and Oktay (2012) defined public open space as a space within the city area which is accessible to all people and is the ground for their activity. UN-Habitat (2015) also defined that public open spaces are all places publicly owned or of public use, accessible and enjoyable by all for free and without a profit motive. In this study, the researcher employs the term 'public open space' because it suits the description of the study that focuses on the space that allows all the people to have access to it and the activities within it, which is provided and managed by public agency.

2.2 TYPOLOGY AND STANDARDS OF PUBLIC OPEN SPACES

Type of public open space is classified according to different variables such as function, ownership, location and etc. According to Byrne and Sipe (2010), public open spaces can also be categorized in terms of the size, usage pattern, location and its intended function. The Scottish Executive Central Research Unit (2001) has classified public open space as encompassing two key types: civic spaces and green spaces. Civic spaces are predominantly paved areas, mainly in town and city centres, for example, urban squares, market places or any hard landscaped areas with civic functions. The green spaces on the other hand are a vegetated land or structure, water or geological features within urban areas; these include parks, gardens, green corridors, children's play areas etc. Public open spaces in cities include two categories: green spaces, and civic spaces such as public squares and streets (Swanwick et al., 2003). Green spaces, also referred to as landscaped open spaces, are the open spaces in the city that have vegetation as a dominating feature (Swanwick et al., 2003). They have different typologies, among them are "amenity green spaces" that can be further divided into several categories, one of them is "recreational green spaces." Nasarawa State Urban Development Board edict (2003) refers to public open spaces as any area within an urban or rural environment that contains natural and human made environment such as Nature reserves, public square, public Gardens, public parks, green open areas and other sport and recreational grounds, derelict and underdeveloped land and even road pavement as well as plazas and other paved concrete areas.

Un-Habitat (2015) distinguishes a variety of different types of public open space, which include civic spaces, active spaces, green spaces, community spaces and natural and semi-natural spaces. They are explaining thus: Natural and semi-natural spaces, Civic spaces, Community spaces, Active spaces and Green spaces.

Table 1: The typology of public open spaces

Main Type	Sub-types
Street	Residential streets, Commercial streets, Boulevards
Square	City square, Market square, Church square, Mosque square
Open space	Parks, Gardens, Camping ground, Picnic ground, Cemetery
Linear system	Paths, Rail corridors, Green corridors , Cycles path , Trails, Crossing
Sports and recreational facilities	Children play ground, Sport fields, Golf courses, Skate parks
Natural and semi-natural green areas	Water front, Forest areas, Grasslands, Wetlands, Channels, Water bodies and streams, Natural reserve

Source: Sandalack and Alanix and Uribe (2010)

Table 2: Guidelines for space standards for the United Kingdom

Level in hierarchy	Min. area (ha) absolute	Min. area (ha) desirable	Area (ha) per 1000 people	Total Population served
Playlot	0,020	0,060	0,060	1,000
Playground	1,500	2,500	0,600	3,000-5,000
Local park	1,000	15,000	0,500	3,000-10,000
Community park	15,000	45,000	0,600	10,000-50,000
Urban park	45,000	140,000	1,200	40,000
Regional park	450,00	2,250,000	4,500	City Wide

Source: Department of the interior, Bureau of outdoor recreation, (2001)

Public open spaces are public gathering spaces such as plazas, squares and parks. They are also, connecting spaces, such as sidewalks and streets, are also public open spaces. In the 21st century, some even consider the virtual spaces available through the internet as a new type of public open space that develops interaction and social mixing. Therefore, Public open spaces can generally be classified into two broad categories according to their use pattern- (a) for active recreation such as play lots, playing fields, sports grounds, stadium, etc. (b) for passive recreation such as gardens, parks, parkways, greenbelts, etc.

2.3 CATEGORIES OF PUBLIC OPEN SPACES IN NIGERIA

In most Nigeria urban centres, public open spaces are owned by Government with the exception of few which are privately owned. In Zaria city, northern Nigeria, identified public space and grouped them into ‘free accesses’ and ‘quasi’ spaces reflecting degree of control and access (Garba 2007 cited in Shaibu, 2012). These spaces are “Dandali” and Neighborhood Community spaces. The “Dandali” is an informal space in front of the Emirs palace surrounded by institutional buildings, while Neighborhoods community spaces are found in the interior of residential quarters,

loosely formed by houses at road intersections (Shaibu, 2012). Goomsu (2014) has identified other public spaces in central area of Abuja as central park, presidential gardens and National Square. Hussain (2009) in the study of Abuja reveals that out of 32 percent of land zoned for public spaces hardly was 15 per cent implemented as at 2013. The estimated open recreational spaces of Ibadan in 2012 were put at 4 per cent or 400 Ha in area which is inadequate for over a million people (Simon, 2015).

2.4 PUBLIC OPEN SPACES PER INHABITANT

The information in Tables 3 shows the standard for provision of public open space is a minimum of 3.8m² per 1000 persons to be apportioned for local and district open space. World Health Organization (WHO) has suggested a minimum limit for an ideal amount of public open space can be generously provided as 9 square meters per person. Minimum limit for the per capita green space has also been identified by the United Nations (UN) as 30m² per person and by European Union (EU) as 26m², but no specific limit for per capita public open spaces has been given by any agency (Khalil, 2014; Kurban, 2017). A study by Shahfahad *et al* (2019) analyses the availability of per capita public open spaces to assess the landscape quality. The public open space available per capita in Delhi is about 20m², and public open space is 30m². The per capita share of public open spaces in East Delhi is 7.01m² to its total area. Wards with high population density have a comparatively low proportion of public open spaces. It is seen that most of the wards did not match the criteria of WHO and UN for per capita availability of public open spaces.

Table 3: International standards for public open spaces

Organization	World Health Organization (WHO)	Public Health Bureau (PHB) USA	European Union	United Nation
Standard m ² Per capita	9 m ²	18 m ²	26 m ²	30 m ²

Source: Mohammad & Atiqur, (2019)

The Neighbourhood-wise per capita availability (percentages) of public open space has been calculated by using formula (Amin, 2012). The public open space per capita is calculated in a different way in each scenario. The following equation is used:

$$PC = \frac{TOS}{P}$$

Where, PC is the per capita (Sq.m), TOS is the total area of spaces, and P is the population.

3.0 RESEARCH METHODOLOGY

3.1 THE STUDY AREA

Nasarawa State is centrally located in the North Central geo-political zone of Nigeria. It lies between latitude 7° 45' and 9° 25' North of the equator and between longitude 7° 42' and 9° 37' East of the Greenwich meridian. Nasarawa State shares common boundaries with Benue State to the south and Kogi State to the West, the Federal Capital Territory (FCT), Abuja, to the North-West, Kaduna and Plateau States to the North-East, and Taraba State to the South-East. Nasarawa State is accessible by road and rail from different parts of the country (Figure 1).

In the same vein, Lafia Local Government which is the fourth largest with a land area of 2,797.5 sq. Km after Nassarawa Local Government Area (5,743.8 sq. Km), Karu (2810.4 sq. Km) and Awe

(2,800.0 sq. Km) are the first, second and third largest LGAs in that order. It is bounded by Doma, Obi, Nassarawa Eggon, Wamba and Kokona local Government in Nasarawa State and Quampan Local Government in Plateau State (Figure 2).

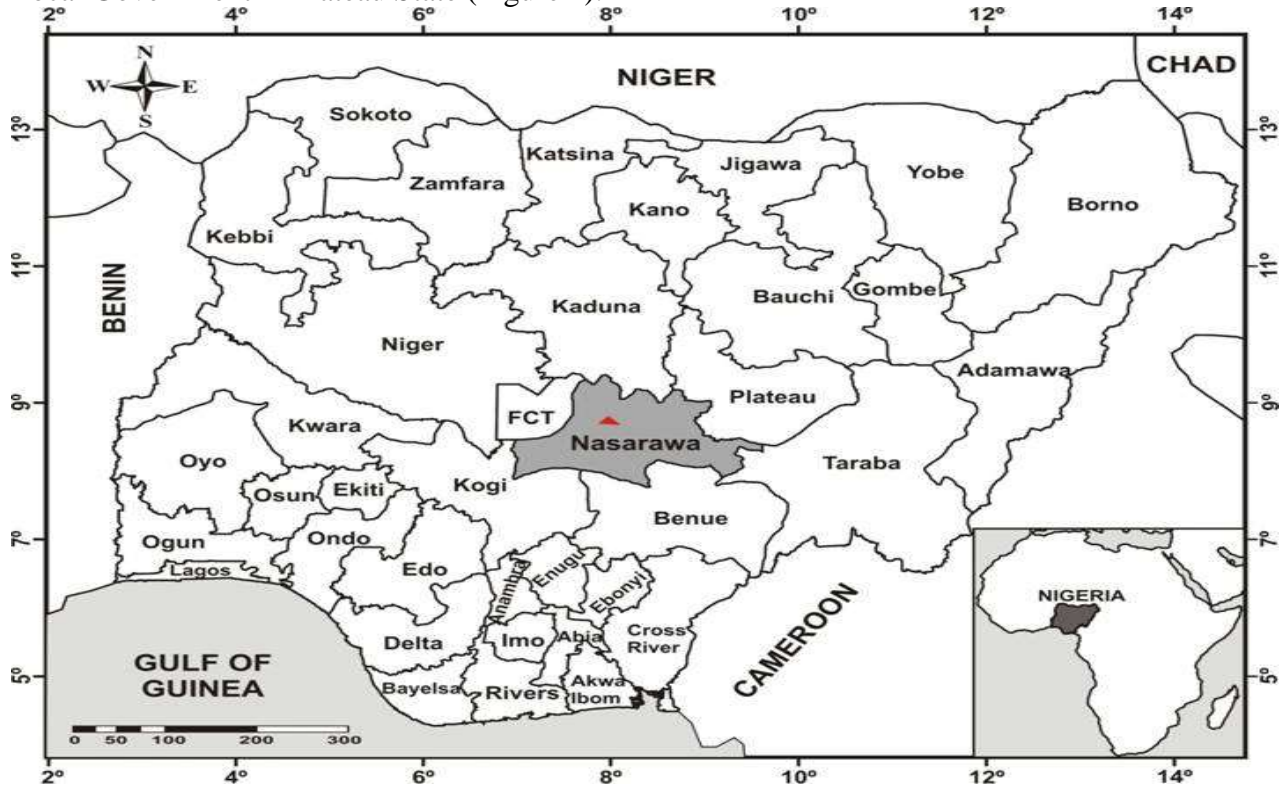


Figure 1: Map of Nigeria showing Nasarawa State

Source: Nasarawa State Ministry of Land Survey and Physical Planning, 2019



Figure 2: Map of Nasarawa State showing Lafia local government areas
Source: Nasarawa State Ministry of Land Survey and Physical Planning, 2019

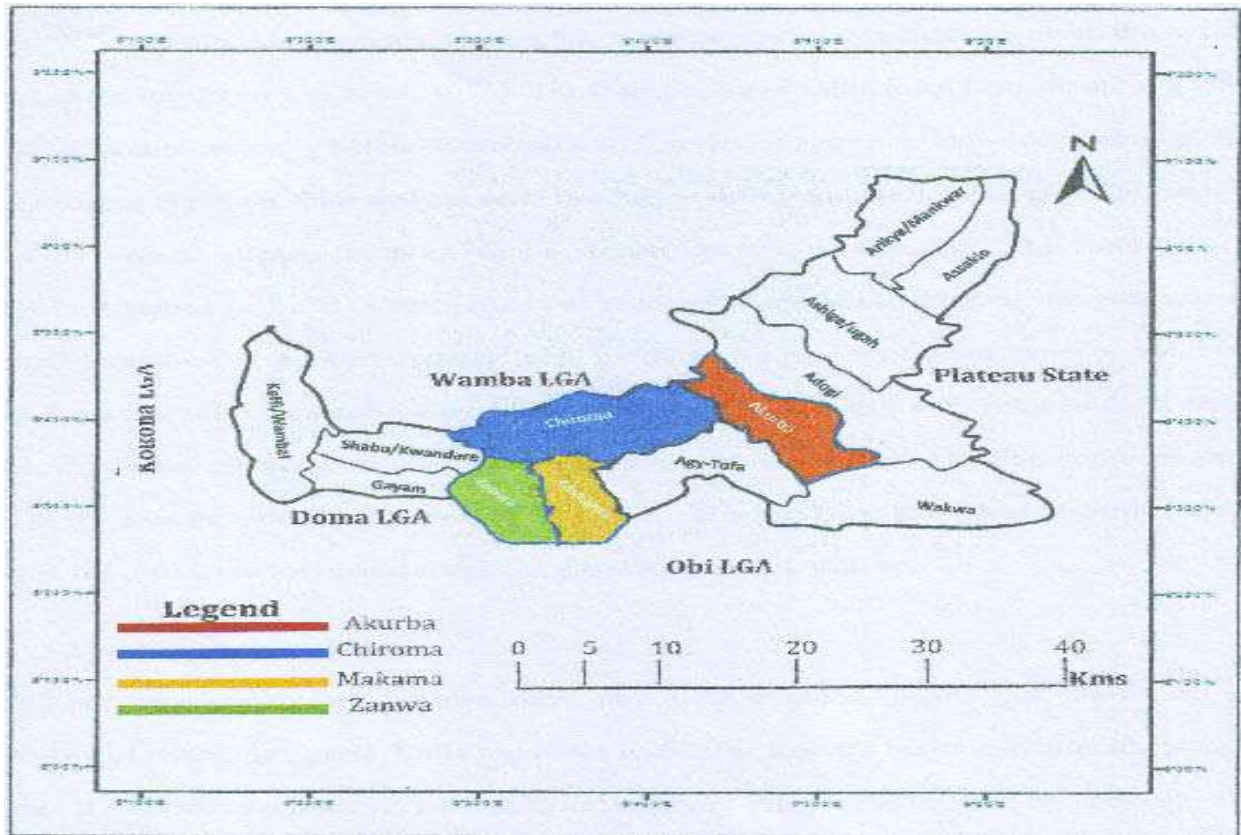


Figure 3: Map of Lafia showing wards
 Source: NAGIS, (2019)

Lafia is located at the south-western part of Nasarawa State, middle belt of Nigeria within latitudes $8^{\circ}25' N$ and $8^{\circ}35' N$ and longitudes $8^{\circ}28'E$ and $8^{\circ}34'E$. The Local Government Area covers an area of about 258Km², extending over an area of about 18km from North to south and 14km from East to West (Iliyasu & Garba, 2021) (Figure 3).

The Lafia local government area has a population of about 330,712 inhabitants (2006 census). Lafia town has experienced rapid population growth due to its designation and continuing functioning as the capital of both Nasarawa State and Lafia Local Government. There is no up to date population figure for any locality in Nigeria. The 2006 census result is disaggregated only up to local government level. National Population Commission population census in 1991 for Lafia town was 87,352 inhabitants and projected to 1998 to be 133,782 by Greater Lafia master plan. This population was then projected to 2006 by integrating the growth rate of 3% per annum observed for the 2006 census which stands at 169,471. This population was then projected to 2023 by integrating the growth rate of 3.5% per annum which stands at 304,150 with an average population density of 287 persons per square kilometers.

3.2 METHODS

A survey research design was employed to help collect data and establish the types of public open spaces in Lafia town. Field survey was by direct measurements carried out using linear tapes to ascertain the sizes of the public open spaces. Geographic Positioning System (GPS) was used to

take coordinates of each public open space. LandSat satellite images of the study area were acquired from NASRDA. This satellite image was imported into the GIS environment to locate the types of the spaces. All the images were made to pass through processes of image enhancement, Geo-referencing, re sampling, image classification and digitizing.

The study classified the current spaces in the city according to the geographical location, condition, and spatial arrangement of each site. To demonstrate the types, sizes and the changes in public open spaces from the creation of Lafia as capital of Nasarawa State to the present condition of public open spaces, the sizes of the different typologies of POS are analyzed. All public open spaces in Lafia urban area were drawn using a geographic information system (GIS). The data were presented in several tables to summarize the typology in Lafia town.

A field survey was conducted from March to May, 2021 to validate the present sizes and types of the different public open spaces of Lafia town through photo-documentation and to qualitatively assess the state of these different public open spaces by analyzing their present function and usage and management.

4.0 RESULTS AND DISCUSSIONS

4.1 TYPES AND SIZES OF PUBLIC OPEN SPACES IN LAFIA TOWN

The study in table 7 revealed that there are 26 numbers of public open spaces and 8 auxiliary spaces in Lafia town with coverage of 474,851m² and out of the total size of spaces, 75,976.16 m² constituting 16% were not properly developed. The public open spaces are categorised into civic spaces, green spaces and quasi-access spaces. The categorization reflects the degree of control and access to them. Some of the public open spaces are freely accessible to the public and are run and maintained by the Nasarawa state Urban Development Board, Ministry of Information, Culture and Tourism, Educational Institutions, Community as well as Religious bodies.

The study also identified some activities in the public open spaces and is grouped into four: social, economic, recreation and religion. Social activities performed include playing, reading or writing, sitting, chatting and gathering. Economic activities performed include food selling, buying and selling goods for daily needs. Recreational activities include sports and exercises. Religious activities related to faith performed in the spaces include religious sermons and concerts, Christmas carols and Quran recitation competition, etc. This result is similar to the study of Shaibu (2012). Public open spaces are critical components of life quality in Nasarawa state. This assertion is supported by Clos (2014).

4.1.1 THE CIVIC SPACES

The table 7 revealed that there are three (3) civic spaces found in different locations of Lafia town which are active space, community space and corridor spaces with the total area of 136,925m² and covers 28.8 percent (Table 5). The civic spaces are:

- 1) The Active Open Spaces: - They are three (3) in numbers in Lafia town with the total size of 44,812m² and covers 9.4 percent of the public open spaces use for civic functions. They comprise of:
 - i. Lafia stadium which is located at Bukan Sidi with the total size of 33,428. The stadium is owned by the State Government and is managed by the Ministry of Youths and Sports. The stadium is used for recreational activities such as football, basketball and volley ball. It is also used for political rallies and religious events.

- ii. Lafia Square which is located at central area, old parade ground with the total size of 6750m². This is owned by the State Government and is managed by the Ministry of Youths and Sports. The place is used for political rallies and religious events.
 - iii. Emir Palace Square which also located in front of Emir Palace at central area with the total size of 4635m². This is owned by the Local Government and is managed by the Emirate council. The space is used for Religious, i.e. EID celebrations, Quran recitation competition, traditional ceremonies, i.e. Turbaning, naming, weddings and funerals and trading activities.
- 2) Community Open Spaces: - They are three (3) in numbers in Lafia town with the total size of 93,112m² and covers 19.4 percent of the public open spaces. They comprise of:
- i. Golf Course which is located at Mararaba area of Lafia town with the total size of 44,652m². The area is owned by the State Government and is managed by the Ministry of Youths and Sports. The space is used for Golf shooting.
 - ii. ECDA Community Space which is located at Millionaire quarters with the total size for 3360m². The space is owned and managed by the ethnic community group. This is used for Cultural Events, i.e. festivities and Recreation, i.e. Football and Social interactions.
 - iii. Neighbourhood Playground which is located at Tudun Gwandara beside Government Science School, Lafia town with the total size of 44,100m². The space is owned by the State Government and is managed by Ministry Youths and Sports. This space is used for Recreation, i.e. Football and Religious events.
- 3) Corridor Open Spaces: - They are spaces that cover roads, streets, paths, green corridors, etc. They are located almost in every neighbourhood in Lafia town and have different dimensions of sizes which are not detailed here.

4.1.2 THE GREEN SPACES

The table 5 revealed that there are two (2) green spaces found in different locations of Lafia town with the total area of 102,537m² and covers 21.6 percent (Table 7). The green spaces are a vegetated land or structure, water or geological features (blue spaces) within urban areas; these include parks, gardens, green corridors, children's play areas, etc.

The green spaces are:

- 1). Recreational Green spaces: - They are five (5) in numbers in Lafia town with the total size of 84,297m² and covers 17.8 percent of the public open spaces. They comprise of:
 - i. Recreational Garden which is located at Shabu with the total size of 22326m². This is owned and managed by the Ministry of Information, Culture and Tourism. The space is used for Recreation, i.e. Leisure, social interactions and economic activities.
 - ii. Recreational Garden which is located at Bukan Sidi Stadium Junction with the total size of 4455m². This is owned by the State Government and is managed by Nasarawa State Urban Development Board. The place is used for Recreation (snooker and checker games), Social interactions and Religion preaching.
 - iii. Sixteen Mangoes Garden which is located at Tudun Gwandara with the total size of 1350m². This is owned by the Nigeria Railway Cooperation and managed by the community. The space is used for Economic activities, Relaxation and Social events i.e. Marriage programme and interactions.

- iv. Lafia East Neighbourhood Park which is located behind Government House with the total size of 32376m². This space is owned by the State Government and is managed by Ministry of Youths and Sports. The place is used for Recreation such Football, Volley ball and Children playground.
 - v. Recreational Garden which is located at Shandam Road beside Air base with the total size of 23790m². This space is owned by the Catholic Organization but is presently managed by Nasarawa State Urban Development Board. It is used for Economic activities, Leisure and social gatherings.
- 2). Natural Green spaces: - The natural green space is one (1) in number in Lafia town located along Kwandare Road, Kwanka with the total size of 18,240m² known as nature reserve and it cover 3.8 percent of the public open spaces. This space is owned by the Ministry of Environment and is managed by Nasarawa State Urban Development Board (Table 6).

4.1.3 THE QUASI-ACCESS SPACES

The study revealed that there are two (2) types of quasi-access spaces found in different locations of Lafia town. They are institutional open spaces and religious open spaces with the total area of 235,389m² and covers 50.2 percent of the public open spaces (Table 7). They are further divided into thirty (30) spaces. The quasi-access Space is a type of spaces in which some greater degree of control is exerted over when access is allowed. This agreed with the study conducted in Zaria city, northern Nigeria, where ten type of spaces are identified and further grouped into ‘civic free access’ and ‘quasi’ public spaces reflecting degree of control and access (Garba, 2007).

- 1). Institutional open spaces: - The largest spaces are the institutional open spaces which include playgrounds, convocation squares and other recreational spaces. They are mostly located in primary schools, secondary schools and tertiary institutions with an area of 196,885m² which constitutes 41.2 percent of the total public open spaces. The spaces are used of recreational, social and religious activities. Recreational activities are football, volleyball, handball, basketball, lawn tennis, badminton, etc.
- 2). Religious open spaces: - The remaining spaces are religious open spaces with area coverage of 43,904m² wide constituting 9.0 of the total public open spaces. The religious spaces are used for religious activities such as prayers, festivities, crusades, Quranic recitations and so on.

Table 4: Public open Spaces in Lafia town, 2022

Type of space	Number	(%) of Coverage	Example	Location	Size (m ²)	Coordinate	Space Usage
1. Civic Spaces							
Active Open Spaces	3	9.4	Lafia City Stadium	Bukan Sidi	33428	447772.39 m E 942010.81 m N	- Recreation (Football, Volley ball)
			Lafia Square	Central Area, Old Parade Ground	6750	446880.34 m E 939246.50 m N	- Political Rallies & Religious events
			Emir Palace Square (Dandali)	Kofar Pada, Core area	4635	446356.49 m E 938574.66 m N	- Religious, i.e. EID celebrations, Turbaning and Economic activities
Community Open Spaces	3	19.4	Golf Course	Mararaba	44652	453634.03 m E 936705.22 m N	- Golf shooting
			ECDA Community space	Millionaire quarters	3360	446457.01m E 940771.54m N	- Cultural Events. i.e. festivities and Recreation, i.e. Football and Social interactions
			Neighbourhood playground	Tudun Gwandara, Besides Science School	44100	445843.96 m E 940465.05 m N	- Recreation, i.e. Football and Religious events

Corridor	-	-	Roads, streets, paths, green corridors	In every neighbourhood	-	-	-
Open Spaces							
Total =	6	28.8			136,925		
2. Green Spaces							
Recreational green Spaces	5	17.8	Recreational Garden	Shabu	22326	450574.49 m E 947188.85 m N	- Recreation, i.e. Leisure and social interactions
			Recreational Garden	Stadium Junction Bukan Sidi	4455	447498.59 m E 942135.84 m N	- Recreation (volley ball, snookers and checkers) and Religion tapsil
			Sixteen Mangoes Garden	Tudun Gwandara	1350	445477.70 m E 939867.45 m N	- Social events (Marriage programme, interactions) and Economic activities
			Neighbourhood Park	Lafia East (Behind Govt House)	32376	449749.33m E 939074.86m N	- Recreation (Football, Volley ball)
			Recreational Garden	Beside Air force base, Shandam Road	23790	451716.71 m E 941590.15 m N	- Leisure and social gatherings
Natural Green space	1	3.8	Natural reserves	Kwandare Road	18240	445680.42 m E 942502.54 m N	- Picnic, Relaxation and Greening

Total =	6	21.6		102,537		-
3. Quasi-access Spaces						
Institutional	27	41.2	Primary Playground			Recreational activities
Public Spaces			Primary School	Shabu	6750	451352.20 m E
			Playing Field			947745.61 m N
			Primary School	Azuba	6300	451636.83 m E
			Playing Field			949740.47 m N
			Primary School	Sabo Pegi-	6300	451624.26 m E
			Playing Field	Shabu		949736.40 m N
			Primary School	Kwandare	6750	445154.87 m E
			Playing Field			947036.51 m N
			Primary School	Bukan Sidi	6750	447432.81 m E
			Playing Field			941714.60 m N
			Primary School	Tudun	6750	445824.70 m E
			Playing Field	Gwandara		940453.59 m N
			Primary School	St. James	5250	446536.17 m E
			Playing Field			939511.98 m N
			Primary School	St. William	6750	446432.71 m E
			Playing Field			939569.71 m N
			Primary School	Lafia south	6300	445558.13 m E
			Playing Field			938584.42 m N
			Primary School	Tudun Amba	5400	445240.59 m E
			Playing Field			937637.48 m N
			Primary School	Dunama	7200	447122.02 m E
			Playing Field			939330.17 m N
			Primary School	Lafia East	5400	448252.04 m E
			Playing Field			938782.69 m N
			Primary School	Mararaba	6750	454172.09 m E
			Playing Field			936683.60 m N
			Primary School	Akurba	6750	452518.32 m E
			Playing Field			942653.70 m N

Primary School	Kurikyo	6375	449783.68 m E	
Playing Field			942977.64 m N	
SubTotal =		95,775		
Secondary Playground				Recreational activities
Secondary School	Kwandare	6300	445144.36 m E	- Recreation
Playing Field			947037.18 m N	(Football,
Secondary School	Tudun	6375	445814.68 m E	Volleyball,
Playing Field	Gwandara		942648.75 m N	Handball,
Secondary School	Science	5400	446503.59 m E	Basketball,
Playing Field	School		939994.00 m N	Lawn tennis,
Secondary School	Ungwan	5400	445338.08 m E	Badminton)
Playing Field	Maina		939372.02 m N	
Secondary School	Tudun Amba	6375	445240.59 m E	
Playing Field			937637.48 m N	
Secondary School	Lafia East	5400	449160.00 m E	
Playing Field			938501.13 m N	
Secondary School	Akurba	6750	452518.32 m E	
Playing Field			942653.70 m N	
SubTotal =		42,200		
Tertiary institution Playground				Recreational activities
Tertiary School	College, Ombi	6750	449932.15 m E	- Recreation
Playing Field	2		945913.43 m N	(Football,
Tertiary School	Poly, Ombi 1	7600	449468.03 m E	Volleyball,
Playing Field			944533.56 m N	Handball,
Tertiary School	Federal Univ	28560	450855.59 m E	Basketball,
Playing Field			936993.11 m N	Lawn tennis,
Tertiary School	Nursing	6750	451358.23 m E	Badminton)
Playing Field	School		936878.38 m N	

			Convocation Square	Federal Univ	9450	451247.25 m E 941527.54 m N	
			SubTotal =		59,110		
Religious	3	9.0	Christians Camp	Ombi 2	27360	448632.41 m E 946206.39 m N	Religious Observance Religious (Christians crude,EID Prayers,)
Open			Ground				
Spaces			EID ground	Bukan Sidi	6400	448233.56 m E 942951.25 m N	
			EID ground	Shandam Road	10144	447078.11 m E 939559.78 m N	
			SubTotal =		43904		
Total =	30	50.2			239,462		
Grand	42	100			474,851		
Total =							

Source: Author, 2022

In summary, public open spaces can be green spaces, such as parks and gardens, play areas, sports facilities, and green corridors. Public open spaces can also be civil spaces such as pedestrian streets and sports facilities. In an urban area, public open space has a recreational effect for the community in the midst of the busy city life.

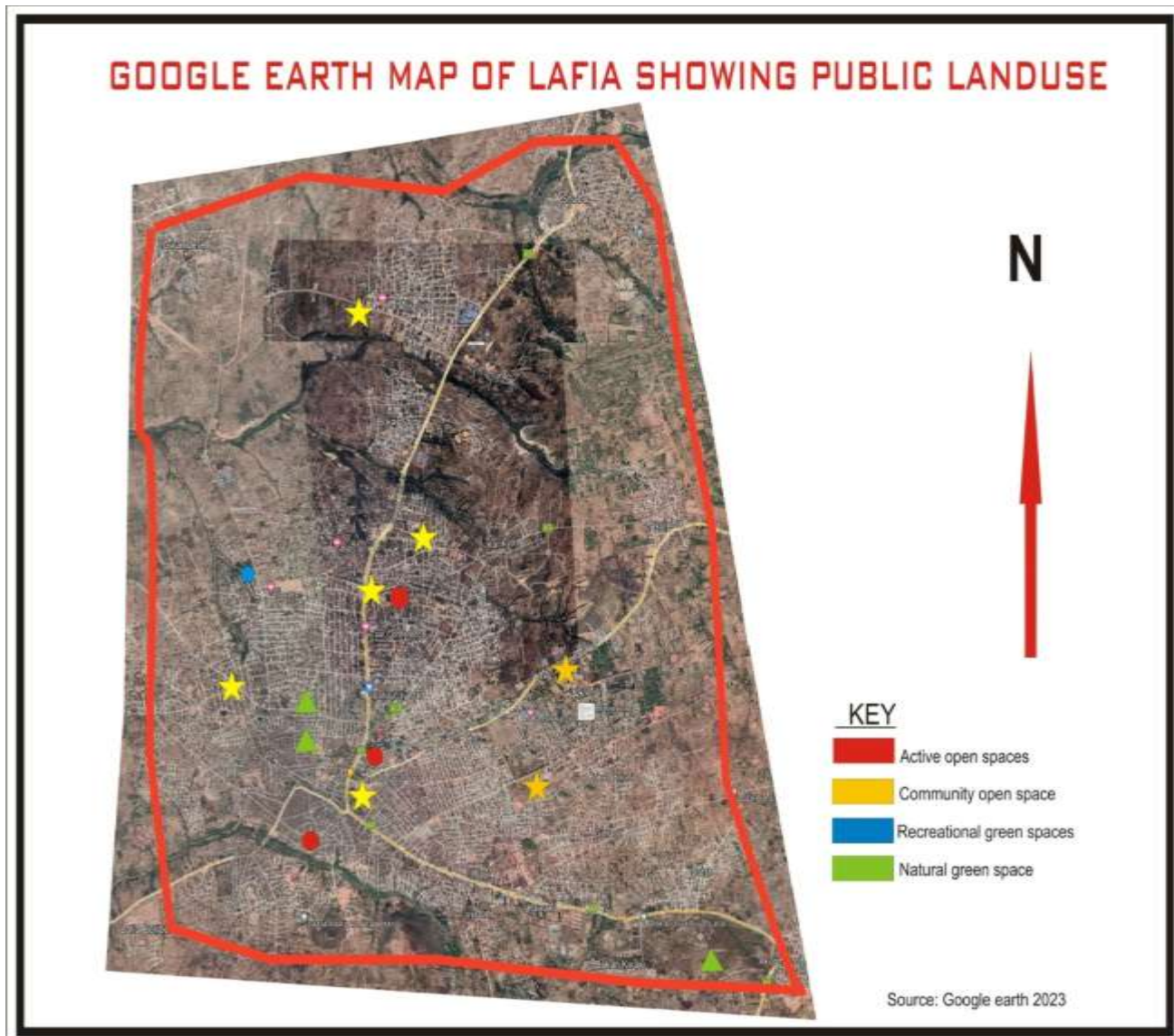


Figure 4: Google map showing public open spaces in Lafia town, 2021
Source: ArcGIS, 2016, ArchiCAD 16, 2023

4.2 CHANGES IN SIZES OF SOME SELECTED PUBLIC OPEN SPACES IN LAFIA TOWN FROM BETWEEN 1996-2021

The study revealed that there are eight identified public open spaces in Lafia town from between 1996-2021. The eight identified public open spaces are; Recreational Garden, Shabu, Recreational Garden, Bukan Sidi, Lafia City Stadium, Lafia town, Lafia Square, Old Parade Ground, Emir Palace Square, Kofar Pada, Sixteen Mangoes Garden, Tudun Gwandara, Lafia East

Neighbourhood Park, Behind Government house and Recreational Garden, Shandam road (Table 4).

It was reveals that public open spaces of Lafia town in 1996 accounted for 8.02 km² representing 9.7% of the urban area, in 2003 the space was 7.5km² representing 9.1% showing decrease, in 2010 it shows a decrease of 5.6km² with 6.9% while in 2017 and 2021 shows also a decrease of 4.2km² and 5.04 with percentages of 5.1% and 6.1% respectively. Majority of the spaces did not change in size from 1996-2021. Of the four spaces that exhibited change in their sizes, all of them show decreased in their sizes.

Table 5: Sizes of some selected public open spaces from 1996-2021

S/N	Year	1996	2003	2010	2017	2021	1996-2021
	Identified Space	Size (m ²)					% change
1	Recreational Garden, Shabu	24,456	24,456	23,721	23,012	22,326	8.7
2	Recreational Garden, Bukan Sidi	5,343	4,782	4,455	4,455	4,455	16.6
3	Lafia City Stadium, Lafia town	33,428	33,428	33,428	33,428	33,428	-
4	Lafia Square, Old Parade Ground	6,750	6,750	6,750	6,750	6,750	-
5	Emir Palace Square, Kofar Pada	4,635	4,635	4,635	4,635	4,635	-
6	Sixteen Mangoes Garden, Tudun Gwandara	3,522	3,120	2,324	1,512	1,350	61.7
7	Lafia East Neighbourhood Park, Behind Govt house	33,321	32,874	32,426	32,376	32,376	2.8
8	Recreational Garden, Shendam road	23,790	23,790	23,790	23,790	23,790	-
Total =		135,245				129,110	4.5

Source: Author, 2021

4.3 ASSESSMENT PER CAPITA PUBLIC OPEN SPACES IN LAFIA TOWN

The study in table 6 revealed that the per capita public open spaces in Lafia town is 1.66m² which has not met the criteria of 30m² per capita green space as recommended by UN neither has it met the criteria of 9m² per capita of public open spaces as recommended by WHO.

This shows that the provision of public open spaces in six planning zones of Lafia town. Population density is the main determinant factor of per capita public open space as an area with high population density and low public open space provision will show low per capita public open space, while Area with low population density and high public open space provision will show high per capita public open space as indicated in Table 11. The results revealed that zone 1 which is Lafia west has total space area of 62,380m² with population of 90,263 and has only 0.7m² per person and zone 6 which is Lafia North has total space area of 78,286m² with population of 22,084 and has 3.5m² per person which is the highest among other zones but inadequate.

Table 6: Per Capita Public Open Space in Lafia

Urban Planning Zones	Total Space area (m ²)	Population	Space per capita (m ²)	Remark
Zone -1 Lafia West Area	62,380	90,263	0.7	Grossly Inadequate
Zone – 2 Bukan Sidi Area	124,158	48,194	2.6	Inadequate
Zone – 3 Lafia Central Area	48,529	35,739	1.4	Inadequate
Zone – 4 Lafia East Area	93,896	60,664	1.5	Inadequate
Zone – 5 Tudun Kawari Area	67,602	28,611	2.4	Inadequate
Zone – 6 Lafia North Area	78,286	22,084	3.5	Inadequate
Total land area (m²)	474,851	285,555	1.66	Inadequate

Source: Author, 2021. Standard Space per capita (9m²) by WHO.

The study revealed that the existing public open spaces in Lafia town covered less than 2% of the urban land use which is grossly inadequate. According to Obateru (2003) 15 percent of the urban land should be allocated for public spaces. The provision of these public spaces in most developed countries usually takes 15-30 percent of an urban land (UN-habitat, 2015). However, this is not practiced in most developing countries. According to Clos (2016) that public spaces in some developing countries take less than 10 percent of the urban land use. The estimated open recreational spaces of Ibadan in 2012 were put at 4 per cent or 400 Ha in area which is inadequate for over a million people (Simon, 2015).

5.0 SUMMARY OF FINDINGS

The findings revealed that there are various types of public open spaces in Lafia urban area. The types include recreation garden, recreational parks, public squares, playgrounds, green spaces among other pockets of open spaces. Lafia people's recreational park is the most popular of these due to its large size, variety of landscape features and better maintenance. These public open spaces are mainly used for relaxation, meetings, physical exercise and are aesthetically appealing. The spaces are mainly used during weekend that is Saturdays and Sundays.

6.0 CONCLUSION AND RECOMMENDATIONS

This study examined the public open spaces types and sizes in Lafia town and found evidence of misguided planning practices resulting from a lack of understanding of the importance of these spaces, not only for residents but also for the town's different sectors. Therefore, this study concludes and recommends that:

- i. There should be proper planning and more precise approach to urban development in order to achieve efficient and effective use of public open spaces in Lafia town.
- i. Planners should enforce compliance as stipulated in the land use management legislation and this can hinder challenges of public open space encroachment.
- ii. The policymakers should consider creating a typology for the city with different categories of public open space in different residential neighbourhoods, this will go a long way of achieving national and international standards.
- iii. Urban Planning Board should adopt a systematic approach to enhancing the spatial planning of public open spaces to meet the international standard for the benefit of the town and its residents.

- iv. Urban planners and designers should develop public open spaces that are not only inclusive, user-friendly, attractive, and functional, but also socially, economically, and environmentally sustainable so they can serve the various facilities and services at their optimum level and contribute to improving the quality of life of users.
- v. Nasarawa State government should acquire more land for creation of more and sufficient public open spaces.
- vi. Ensure that all stakeholders are involved during the creation, implementation and maintenance of public open space in the town. In this case, public participation should be emphasized.
- vii. There should be education and involvement of community members, including other stakeholders in public open space management.
- viii. Restructuring of existing public open spaces to make them more usable and efficient.

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