Green Spaces in the Context of Spatial Urban Development: Interrogating the Case of Federal Capital City of Nigeria

Oluwaseun Morenike Olukoya[1] and Obafemi Olukoya[1]

[1]Affiliation not available

September 20, 2018

Abstract

This study addresses the challenge of disappearing green space within the Federal Capital City (FCC) of Nigeria. The study investigates the multiplicity of factors which contribute to the disappearance of the green spaces and conclusively suggests an approach to conserving the green spaces with the surging urbanization in view.

Title: Green Spaces in the Context of Spatial Urban Development: Interrogating the Case of Federal Capital City of Nigeria

Authors: Olukoya Obafemi A.P[1] (M.Arch) and Olukoya Oluwaseun. M[2] (M.Arch)

Affiliations: [1] Doctoral Researcher, Faculty of Architecture, Civil Engineering and Urban Planning. IGS: Heritage Studies PhD Program. Brandenburg Technical University, Cottbus-Senftenberg, Germany

[2] Principal Architect, Olukoya Obafemi Consult (OOC), Area 1, Garki, Abuja, Nigeria.

Email: Olukoyaobafemi@yahoo.com[1]

Serioun@gmail.com[2]

Abstract

Generally, green spaces play an irreducible role in the sustainability of urban areas. Such roles include social, economic, cultural and environmental aspects. Thus, preserving urban green spaces has stimulated diverse positions in both researches and international debates overtime. In spite of the abundance of positions however, preserving green spaces in growing cities of developing countries with changing urbanization conditions has not been given comparative attention. Against this background, this paper makes a case of the Federal Capital City (FCC) of Nigeria as a typical city in its development phase in a developing countries with surging urbanization condition. In this case, over the last few years, there has been an alarming disappearance of designated green spaces in the city, against what was planned for in the Master Plan in 1979. In spite of the enactment of land use policies, there is nevertheless a consistent disappearance of green spaces in this city. As a point of departure therefore, this research argues that there is an urgent need for scientific study which investigates and document the status quo of green space in the city using the Master Plan as a reference point. To achieve this aim, gathering and interpretation of data which lead to the arguments and descriptions are presented methodologically based on a triangulated research approach. Conclusively, this paper posit that demonstrating the impacts of rapid spatial development on green spaces in developing cities such as the FCC, Abuja can be a cautionary case for the future of cities in developing countries.

Keywords: Urban Green Space; Spatial Development; FCC, Abuja; Developing Countries; Nigeria

1. Introduction

Generally, cities are the physical reality of the grip of man upon nature (Le Corbusier, 1929). They are human-made artefacts and are often opposed to nature (MacHarg 1971). Thus, in the history of urban development, urban planners have tried to create urban spaces that also incorporate elements from nature (Ibid). Nevertheless, green space is under permanent pressure today due to a complex of reasons which revolves around spatial developments in urban areas (Rodenburg, et al, 2001). In this regard, most developed countries have focused on the pursuit of more rational schemes on environmental management and land use planning to achieve sustainable urban land use and protect green spaces. In developing countries however, the reality is different. This is due to the changing socio-economic situation, growing population, surging urbanization rates and lack of political will to implement land use policies, just to mention a few.

Against this backdrop, this research makes a case of the Federal Capital City (FCC) of Nigeria as a typical example of city in its development phase in Africa's most populous country. Today, the urbanization rate in Abuja is at an alarming rate of 8.32% per annum and this makes it the fastest growing city in Africa (Myers, 2011). The initial Master Plan of the city developed by the International Planning Associates (IPA) in 1979 (IPA, 1979) provided for a foreseen population of 3 million people (Ibid; Jubril, 2006) and provided for such green spaces to sustain such population. However, today, its day-time population often reaches up to 7 million (Iro, 2007; Abubakar, 2014). As a result of this explosive and unforeseen population influx, the city has been confronted with a complex of challenges. Such challenges includes, acute shortage of housing (Abdullahi, 2010; Umoh, 2012), the multiplying informal settlements (Amba, 2010; Jibril, 2006), water scarcity (Abubakar, 2012), dilapidated sewer systems (Ilesanmi, 2006; Ojo, 2011) and traffic congestion (Benna Associates, 2009).

To respond to the mentioned challenges in the context of spatial development, it has been accompanied by an alarming disappearance of designated green spaces in the city, against what was planned for in the Master Plan in 1979. In spite of the enactment of a continuum of land use policies such as the 1978 Land Use Act, the 1992 Urban Development Policy, the 1992 Urban Regional Planning Act, the 2002 Housing and Urban Development (Alabi & Akinbode, 2010; Olajuyigbe & Rotawa, 2011), there is nevertheless a consistent disappearance of green spaces in this city as demonstrated in figure 1.

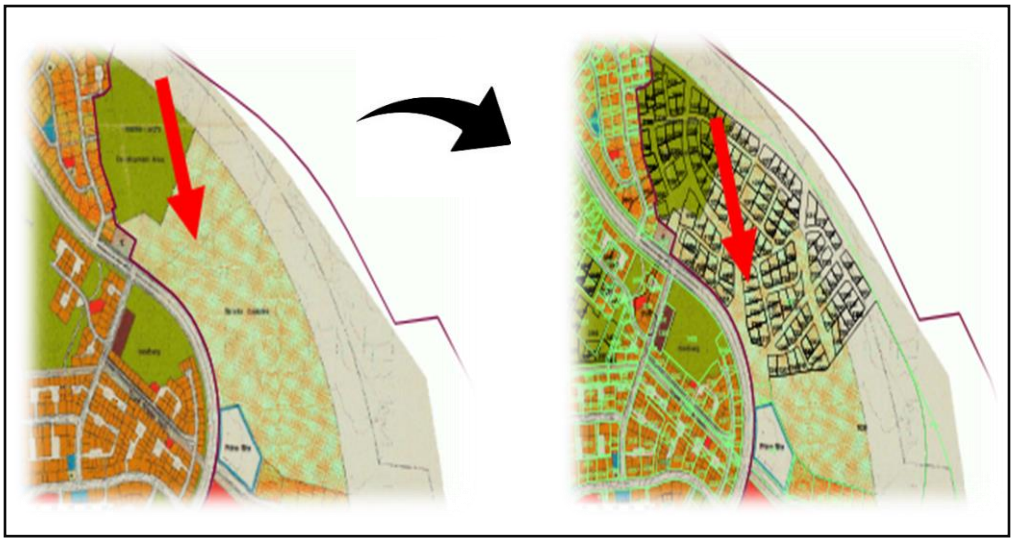


Figure 1. Showing an example of the current utilization of green space in Abuja (Jibril, 2006)

As a point of departure therefore, this research argues that there is an urgent need for scientific study which investigates and document the status quo with the Master Plan of the capital city as a reference point. To drive the arguments for the aim, this research adopts and adapts the widely used framework "Pressure–State–Response" (PSR) of the Organization for Economic Co-operation and Development (OECD 1993, 1998). This framework is based on three kinds of indicator: pressure, state and response indicators (figure 2).

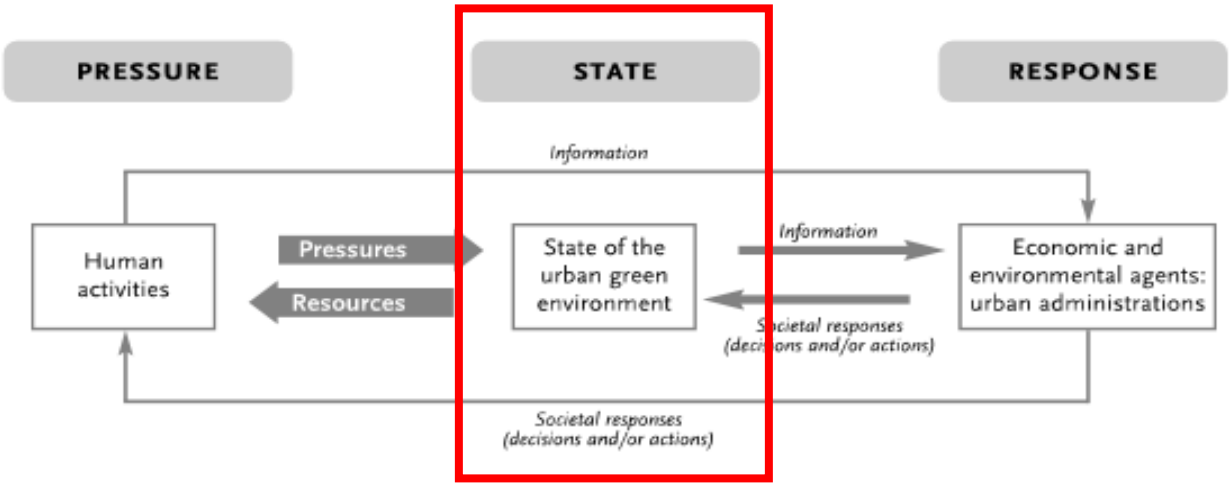


Figure 2. PSR (pressure–state–response) framework (Source: OECD 1993). The focus of this paper is on the encircled portion.

According to figure 2 and in the context of this paper, the following are the definitions of the mentioned indicators are adapted from Boyd, 1997; van Delft, 1997 and Rotmans, 1997. Pressure indicators refers to the forces behind the development (e.g. construction of infrastructure) and utilization of urban green. However, they can also represent social, economic and ecological driving forces stimulating the development and utilization of urban green. State indicators are defined as the current state-of-the- art of urban green space and the quality in the case. Lastly, Response indicators refers to the human intervention in response to the loss of green spaces. This represents the policy decisions on the part of the responsible authorities

Based on this approach, the focus of this research is therefore on the State indicators. Today, there are a very scant literature which interrogates the state of the green spaces in this city. Therefore, this paper posit that investigating and documenting the impacts of rapid infrastructural development on green spaces in developing cities such as the FCC, Abuja can be a cautionary case for the future of cities in developing countries. Furthermore, this is an obligatory ingredient for achieving the evidence based argument for developing a plural framework which brings quest for spatial development within cities and preservation of green spaces into a common framework. Against this background, this paper is organized as follows. In the next section, the concept of green spaces and its roles in urban areas is briefly discussed. The subsequent sections focuses on the Abuja city case study. The historical and current situation are adumbrated. The other sections focuses on the methodology, discussion, recommendations and conclusion.

2. Green Space in Urban Areas: A Review

Urban green spaces can come in numerous distinctive shapes and sizes. They can incorporate expansive territories like parks, fairways, zoos, the distance down to empty parts, medians on side boulevards and indeed grower hanging off of a window in a rear way (Kuti, 2015). By definition, a green space is a land that consists predominantly of unsealed, permeable, soft surfaces such as soil, grass, shrubs and trees. This

emphasis is the predominant character due to the fact that green spaces may include buildings and hard surfaced areas. Therefore, it is the umbrella term for all such areas whether or not they are publicly accessible or privately managed (Dunnett et al., 2002). Generally, the term green space is often used interchangeably with open space. However, open space is an area of undeveloped land which is normally held as horticultural, recreational or characteristic area utilization. In any case, under recreational land use, green spaces also exists which are changed over to open spaces in numerous urban areas (Valk & Dijk, 2009). Furthermore, green spaces could be public or private in urban areas and could be easily differentiated as those directly (e.g. active or passive recreation) or indirectly (e.g. positive influence on the urban environment) available for the users (Tuzin et al, 2002). Thus, green spaces represent an important environmental component of urban areas that covers all open spaces primarily covered by vegetation which are directly or indirectly available for use (URGE Team, 2004).

As a concept, however, the conception of green space in urban areas is not new in research. It has been thoroughly discussed from classical research to contemporary times. It has taken diverse forms over time as regards the related conceptions within the urban context. In early nineteenth (19th) century of the mid-European bourgeois, the creation of urban green spaces was regarded as a candid trend within their culture. Initially during the early times, such green spaces were to exhibit the grandeur as well as the supremacy of any existing constitutional system (Poëte, 1913). As an appellation however, green space is a more recent term and its inception can be traced to the urban nature conservation movement and the European contemplating the planning of green space which began in United Kingdom (Dunnett et al., 2002). In recent literature, urban green spaces has been worked out in similar definitions and assembled as indicated by the capacities they perform in three domains which include economic, social and environmental (Tuzin et al., 2002; Dunnett et al., 2002; URGE Team, 2004; Alberti, 2008; DeWolf, 2009).

2.1 Classification of Urban Green Spaces

Generally, green spaces are classified according to the primary uses which includes recreational purposes, exploratory, social and also natural green space (Brinkyte, 2013). They can include large areas like parks, golf courses, zoos and also vacant lots, medians on side streets, and even planters hanging off of a window and in road lanes (DeWolf, 2009). Green space may also be informally created through communities using derelict urban spaces. Community gardens constitute one of such forms of informal green space (Kellett and Rofe, 2009). However, Dunnett et al. (2002) produced a typology of urban green space comprising of four main classifications, namely; amenity green space, functional green space, semi-natural habitats and linear green space. These illustrations have been represented respectively in the Table 1 below.

Table 1. Typology of urban green space according to Dunnet et al. (2002)

Typology of Urban Green Space		
Primary classification	Secondary Classification	Associative Uses
Amenity Green Space	Recreation Green Space	Parks and Gardens Informal Recreation Areas Outdoor Sports Areas Play Areas
	Incidental Green Space	Housing Green Space Other Incidental Space
	Private Green Space	Domestic Gardens
	Productive Green Space	Remnant Farmland City Farms Allotments

Functional Green Space	Burial Grounds	Cemeteries Churchyards
	Institutional Grounds	School Grounds [including school farms and growing areas] Other Institutional Grounds
Semi-natural Habitats	Wetland	Open/Running Water Marsh, Fen
	Woodland	Deciduous woodland Coniferous woodland Mixed woodland
	Other Habitats	Moor/Heath Grassland Disturbed Ground
Linear Green Space		River and Canal Banks Transport Corridors (road, rail cycle ways and walking routes) Other linear features (e.g. cliffs)

2.2. Roles of Green Spaces in Urban Areas

Generally, green spaces play an irreducible role in the sustainability of urban areas. Such roles include social, economic and environmental aspects. Thus, the quality of life in urban environment depends very much upon the quality of the green spaces (Goode 1990; Hough 1984). Quality of life in this context is defined as a combination of life conditions and satisfaction (Felce and Perry, 1995). Each of the benefits of urban green space are briefly discussed as follows

2.2.1 The Environmental Benefits

Urban green spaces plays an important environmental role in maintaining the ecosystem services ranging from regulation of urban climate to the maintenance of biodiversity. Generally, urban areas usually have differences in solar input, rainfall pattern and temperature in comparison to rural areas (Heidt &Neef, 2008). Also, urban green spaces can reduce air pollutants with the ability to trap dust and smoke particles through vegetation (Bolund & Sven, 1999). Furthermore, urban green spaces performs preservation functions. It preserves the cultural and natural local heritage due to the fact that it provides habitat for a diversity of urban wildlife (such as birds and insects). Urban green spaces also conserves the diversity of urban resources such as trees and plants (Rodenburg, et al 2001).

2.2.2. The Economic Benefits

Generally, green spaces provides cooling effect and help to lower air temperatures through the provision of shade and evapotranspire. Therefore, one of the ways to reduce cost of cooling buildings is through the usage of vegetation and it has been increasingly recognized as a cost effective reason for increasing green space and tree planting in temperate climate cities (Heidt &Neef, 2008).

2.2.3. Social Benefits

Urban green spaces serve as a near resource for relaxation; provide emotional warmth. For example, in Mexico City, up to three million visitors are drawn to the centrally located Chapultepec Park and they enjoy

a wide variety of activities (Sorensen, et al, 1997). Generally, green spaces are assumed to be beautiful and therefore have an aesthetic appeal. Thus, the availability of urban green spaces in a city are argued to increases the quality of life, due to the beauty quality they possess which enables people to be conscious of space and time (Rodenburg, et al 2001).

Therefore, green spaces assume a key role in the efforts towards enhancing the urban environment and improving the quality of urban life and play a key role for performing sustainable ideals However, despite the overwhelming advantages of urban green spaces, they are under permanent pressure today due to a complex of reasons (Rodenburg, et al, 2001). Urban areas everywhere throughout the world are confronting genuine difficulties as an issue of increasing population, increment in their spatial development and environmental change. In this regard, preserving green spaces in cities has stimulated diverse positions in research and dominated international debates from classical times to contemporary era. In spite of the abundance of debates and positions however, preserving green spaces in developing cities, especially in developing countries with changing economic and urbanization conditions has not been given comparative attention in research

3. The Abuja Case

Abuja city is the Federal Capital Territory (FCT) whose land area of about 8000 km^2. Geographically, Abuja lies at latitude 9.07N and longitude 7.48E, and at an elevation of 840 m (2760 ft) above sea-level (IPA, 1979; AGIS, 2006; Jibril, 2006). Abuja was to be treated as a state upon its creation as stipulated in the 1999 Constitution of Federal Republic of Nigeria. It is the most rapidly growing city in Africa today (Iro, 2007; Abubakar, 2014).

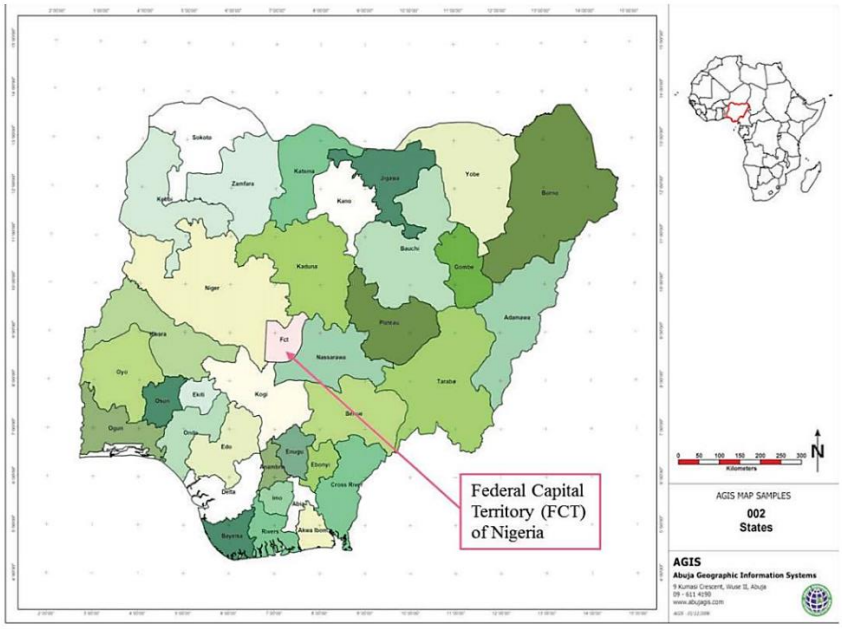


Figure 3. Map of Nigeria showing Abuja and its location in Africa (AGIS, 2006)

3.1 Urban Planning Provision for Green Space in Abuja

The design of Federal Capital City (FCC), Abuja was based on a concept of a garden city. In this context, the Federal Government of Nigeria commissioned the International Planning Associates (IPA) to design the layout of the city and the full usage of the Master Plan started in the early 1980s. In this Master Plan, thirty two percent (32%) of land area was designed to be open areas as well as green spaces (Abubakar, 2013).

The area designated for various functional spaces and for the entire greenery was twenty five percent (25%) while seven percent (7%) was for parks (IPA, 1979). The Master Plan of Abuja turned into the directing guideline for the organized advancement of the city and has been being used in the most recent 30 years (IPA, 1979).

The Master Plan of Abuja provided green spaces which were either developable or undevelopable green spaces. According to Jibril (2010), the developable green spaces included open spaces, recreational facilities, parks and gardens, children playgrounds, outdoor games, sport centers, national, district/neighborhood parks. As well, the undevelopable green spaces were provided for and it was aimed to be further established by developers from time to time. Such green spaces include green stretches along valleys, riverbeds, hilly patches and some incidental open spaces (Jibril, 2010). Figure 4 shows an illustration of the green spaces within Abuja environs.

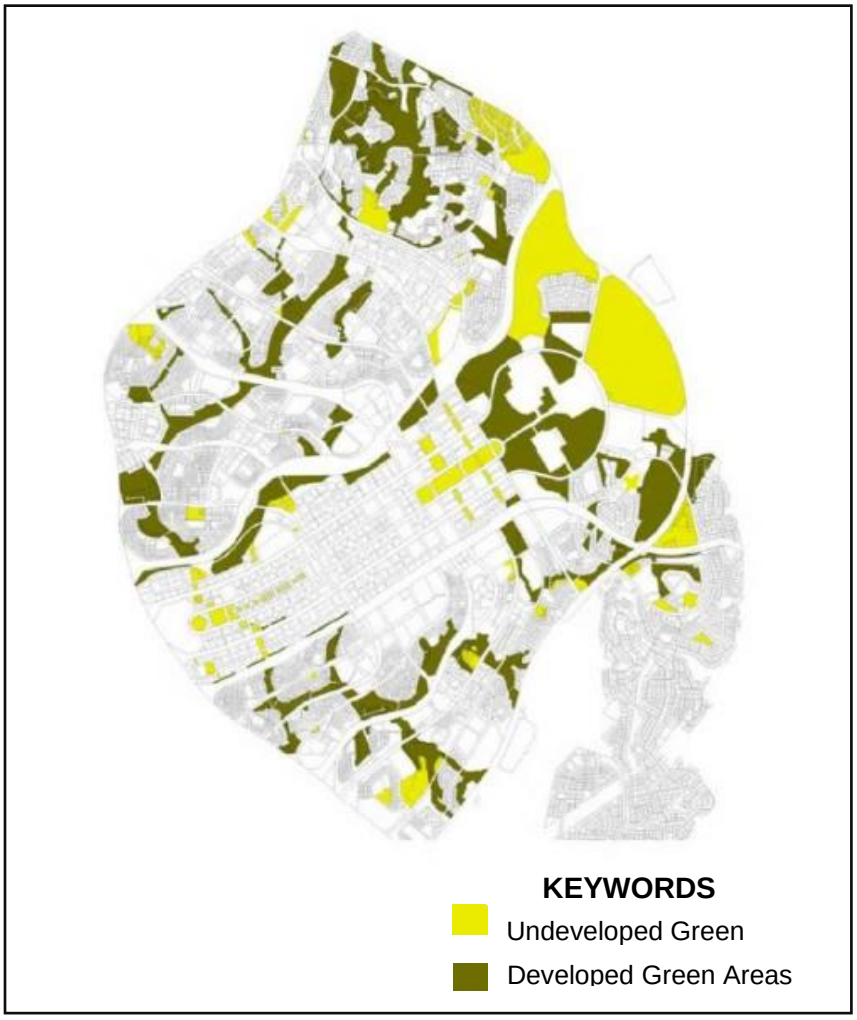


Figure 4. Green overview map of the Federal Capital City of Abuja (Abuja Geographic Information System (AGIS), 2006)

As planned, Abuja also known as the Federal Capital Territory, is integrated into seven sub-districts specifically: Federal Capital City (FCC), Abuja Municipal Area Council (AMAC), Gwagwalada Area Council, Abaji Area Council, Kuje Area Council, Bwari Area Council and Kwali Area Council (IPA, 1979: 27). However, it is imperative to state that this paper is limited to the analysis of the situations concerning the green spaces in Federal Capital City (FCC) in Abuja. Federal Capital City (FCC) covers over two

hundred and fifty kilometres (250km) of the eight thousand kilometres (8,000km) of Abuja, Nigeria (IPA, 1979; AGIS, 2006; Jibril, 2006). It is situated in the north-eastern part of FCT. The configuration of the Federal Capital City of Abuja was given in a development of four-phases; with the city separated into divisions which themselves were subdivided into districts and can been in Figure 5.

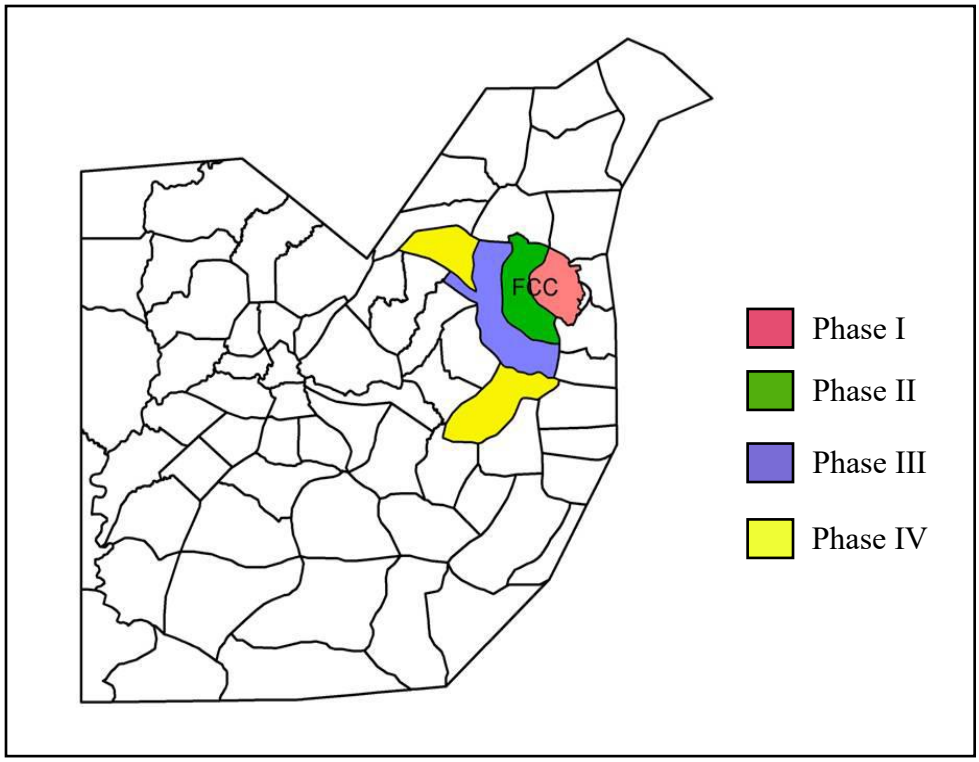


Figure 5. Map of the Federal Capital Territory (FCT), showing the location of the Federal Capital City (FCC) in Abuja (AGIS, 2006)

Sadly, most of the designated green spaces within Abuja have been replaced with residential and commercial developments. A case study in Figure 1 depicts the green territory in Abuja by Ministers' Hill within the Maitama District that has been eradicated by bulldozers in arrangement for private developments.

4. Methodology

The research is organized into two broad categories namely; the theoretical part and the empirical part. Tools to be used ranged from text-based content analysis to field inspection. The arguments in the theoretical part of the research is driven by secondary data collected via critical review of relevant literature while the empirical section is based on field work via case study action. Methods are selected flexibly according to the particular research question and objective to be attained. In some cases, several methods would be applied to the same set of data for the benefit of reconfirmation of the results. To tailor the research method and provide the necessarily elaborations on the aims, this research is driven by the following research question

- What is the state of the green space in Abuja today?
- What are the typologies of green spaces?
- What are the ecological zones which characterizes this green spaces?
- What is the distribution of the available green spaces today?
- What are the accessibility to the available green space?

- What are the factors responsible for the decline of green space?

Therefore, to provide the necessary answer to this questions, the methodological steps are organized in three distinctive stages of evolution, towards broadening on the sources of data and confirmation of data with multiple source. All three stages included the highlighting and categorizing of arguments used to affirm the state of the green space in the city layout. The stages are as follows;

4.1 Stage 1: Use of Geographical Information System (GIS)

The data source for stage one is mainly through the use of Geographical Information System (GIS). Meaning that the satellite map of Abuja was searched and emphasis was placed on the available green spaces within the layout. The available green spaces were identified using the Master Plan as the threshold and subsequent captured as JPEG images. The captured images were architecturally drawn out using Autodesk AutoCAD. Several images of maps were produced during this process and were invigorated against the available green space in the layout in 1979.

Concerning data analysis, two different approaches were undertaken – direct and indirect – distinguished by method, but aiming at the same result (Silva & Roders, 2012). The method used for the direct approach consisted in establishing a correlation between the existing green spaces today and what was provided for in the Master Plan in 1979. The method used for the indirect approach followed the process of coding, all images extracted from the GIS were organized and coded in accordance to the typology of green spaces identified in the Master plan.

4.2 Stage 2: Relation between Document and GIS Map

The data sources for stage 2 were mainly documentary and oral. The purpose was to verify the relation between the provision of GIS and the provision of the Master Plan. Two types of documents were analyzed in this phase. One document was an AutoCAD file of the Master Plan and the other is a PDF document of the original Master Plan. Furthermore, the experiences of the involved stakeholders (policy implementation) in the various governmental parastatals were also incorporated. To cope with the difficulties on gaining access to all the relevant documentation, an informal open ended discussion was held with the staffs of Abuja Geographic Information System (AGIS). Among the various office in charge of implementation, the AGIS was selected due to the fact that they are the outfit responsible for the computerization of the cadastral system and the restoration of the land uses to the original master plan (Akingbade,et al, 2012).

A comparison was also made by the direct and indirect approach. The results of the informal interview conducted with the stakeholders was invigorated against the maps that were already drawn out using AutoCAD. For a better illustration and faster perception of the results, a specific color was attributed to areas on the layout where the green spaces have already disappeared.

4.3 Stage 3: Relation between GIS Map, Document and Site Survey

The data sources for this stage were mostly through site visit. This was done to verify the correlation between the images produced via the GIS, Master Plan and the empirical situation. Site survey was conducted using the layout provided by the Master Plan to locate the designated green spaces. The locations of visit was limited the case which is the districts a within the Phase I of the Federal Capital City (FCC), Abuja which is the main case of the research. This phase was conducted in the company of surveyors, although, access were not granted to a few green spaces such as the IBB Golf Course which required membership for access to be granted. This served as one of the limitations of the site survey. One of the advantages from this step is that when comparing documents, it provides immediate distinction between the existing situation and what was provided for in the Master Plan in 1979.

Conclusively, the interpretation of data which lead to the arguments and descriptions presented is methodologically based on a triangulated research approach. This means that different research approaches were utilized to analyze the set of data gathered. Also, analysis was achieved by interpretive coding through the maps produces and classification of the valid data to generate interpretations and verdicts from the collected data.

5. Results

After following the methodological steps, are the result of the iterative steps. **Five** maps were produced and they are described as follows;

5.1 The Status Quo of Green Space in Abuja

The locations of the districts and the existing green spaces within the Phase I of the Federal Capital City (FCC), Abuja are being illustrated in Figure 6. The description for Figure 6 can be seen in the Table 2 below. Taking into cognisance the description of green spaces in urban landscape according to Dunnett et al. (2002), the existing green spaces in Abuja have been placed under the classifications

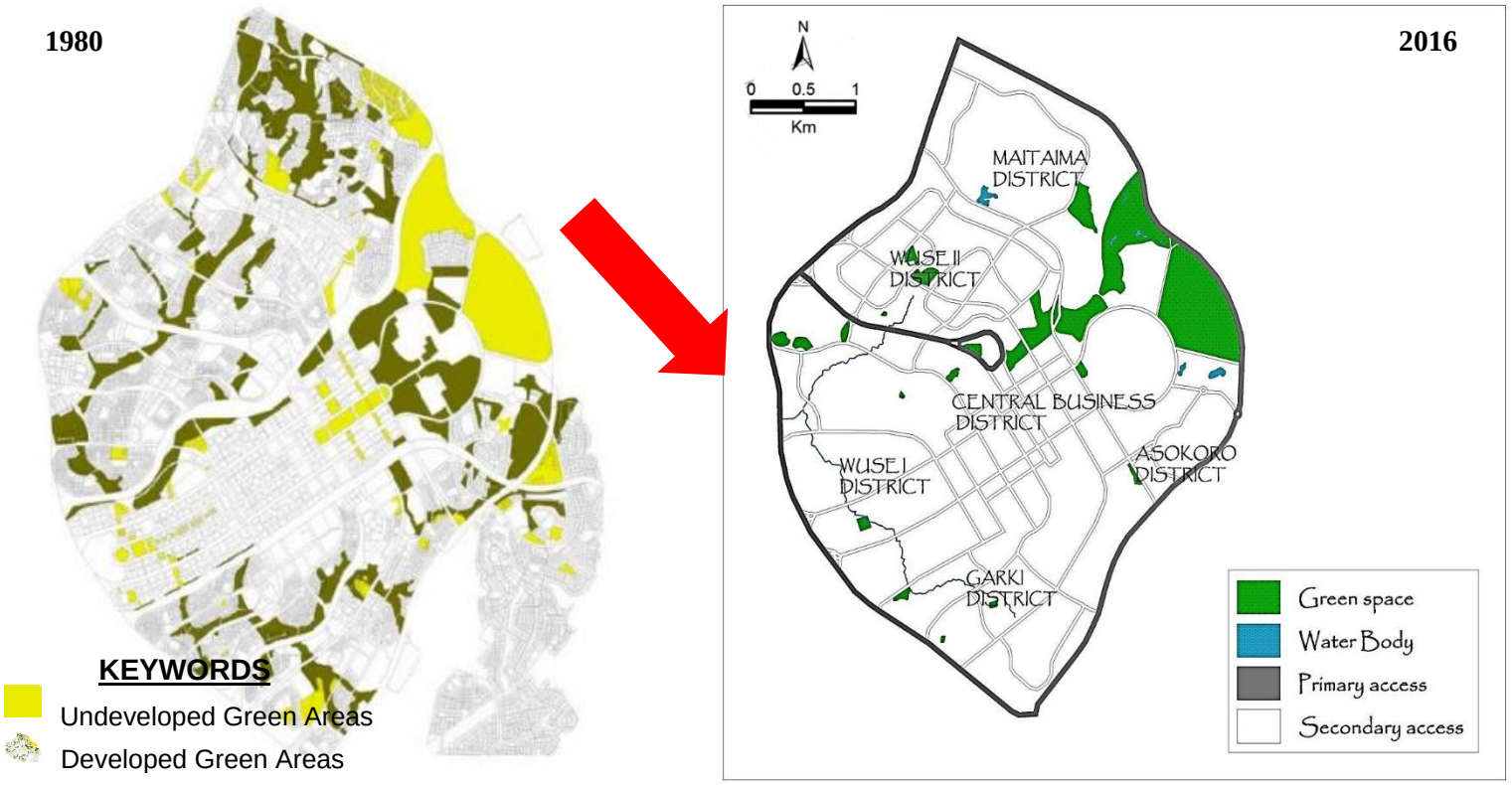


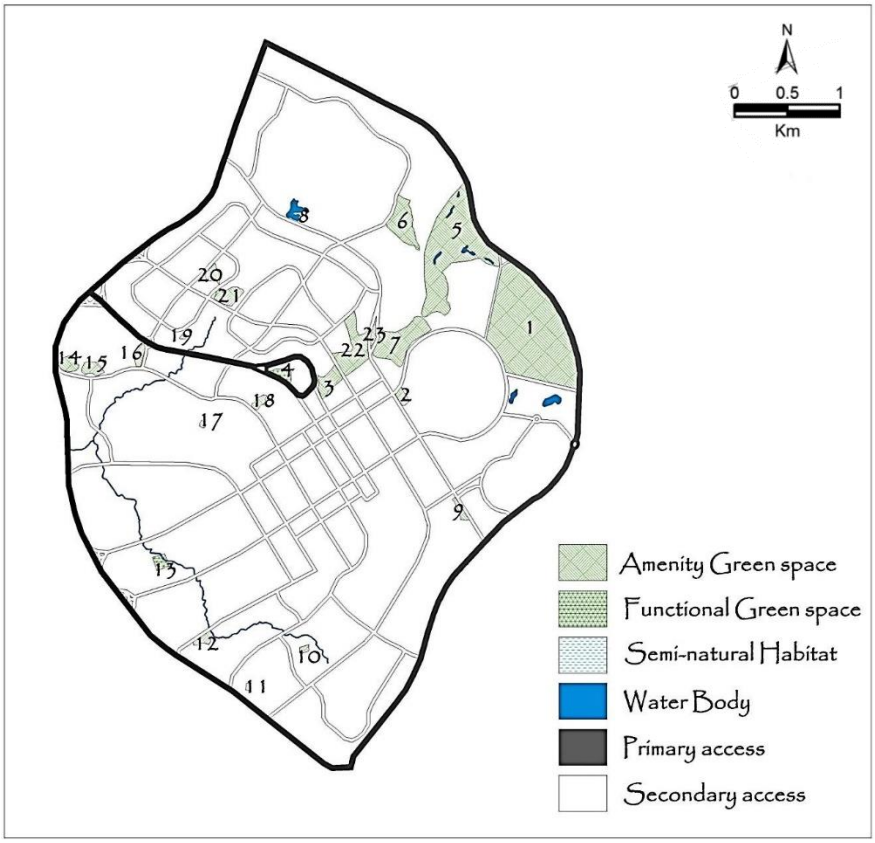
Figure 6. Map indicating the status quo of green space by districts in Abuja and the Master Plan

Table 2. Description of the existing Green spaces in Phase I of Federal Capital City (FCC), Abuja

District	Number	Name	Approximate Land Cover	Typology of Urban green spaces (Map 1)	Categories of Green spaces (Map 2)	Sub-categories of Green space (Map 3)	Basic Natural Features (Map 4)	Distances of green spaces / Walking distance radius to the immediate built environment (Map 5 and Map 6)
Central Business District	1	National Arboretum	100 hectares	Amenity Green space	Institutional grounds	Other Institutional ground	Savannah Zone (Savannah Woodland, Grassy Savannah and Savannah shrubs), Rain forest and Water Feature (Water fountains and pools)	600m / 15 mins
	2	Secretariat Park	5.9 hectares	Amenity Green space	Recreation Green space	Parks and Gardens	Savannah Zone (Savannah Woodland, Grassy Savannah and Savannah shrubs)	500m / 15 mins
	3	Durban St. Neighbourhood Park	14 hectares	Amenity Green space	Recreation Green space	Informal Recreation area	Savannah Zone (Savannah Woodland, Grassy Savannah and Savannah shrubs)	500m / 15 mins
	4	National Children's Park & Zoo, Abuja	6.8 hectares	Functional Green space	Productive Green space	Remnant Farmland	Savannah Zone (Savannah Woodland, Grassy Savannah and Savannah shrubs) and Wildlife	500m / 15 mins
Maitama	5	IBB Golf and Country Club	101 hectares	Amenity Green space	Recreation Green space	Outdoor Sport area	Savannah Zone (Savannah Woodland, Grassy Savannah and Savannah shrubs) and Water Feature (Ponds, Lakes and Streams)	600m / 15 mins
	6	Maitama Neighbourhood Park	15.5 hectares	Amenity Green space	Recreation Green space	Informal Recreation area	Savannah Zone (Savannah Woodland, Grassy Savannah and Savannah shrubs)	500m / 15 mins
	7	Millennium Park	32 hectares	Amenity Green space	Recreation Green space	Parks and Gardens	Savannah Zone (Savannah Woodland, Grassy Savannah and Savannah shrubs) and Water Feature (Water pools and Water fountains)	600m / 15 mins
	8	MFCT Fishery	6.9 hectares	Semi-natural Habitat	Wetland	Open / Running Water	Water body (River flows) and Savannah Zone (Savannah Woodland, Grassy Savannah and Savannah shrubs)	500m / 15 mins
Asokoro	9	Bulet Park	4.6 hectares	Amenity Green space	Recreation Green space	Informal Recreation area	Savannah Zone (Savannah Woodland, Grassy Savannah and Savannah shrubs)	500m / 15 mins
Garki I	10	Glaval Park	4.2 hectares	Amenity Green space	Recreation Green space	Informal Recreation area	Savannah Zone (Savannah Woodland, Grassy Savannah and Savannah shrubs)	500m / 15 mins
	11	Abuja Park	3.9 hectares	Amenity Green space	Recreation Green space	Informal Recreation area	Savannah Zone (Savannah Woodland, Grassy Savannah and Savannah shrubs)	500m / 15 mins
	12	Recreational Park	7.4 hectares	Amenity Green space	Recreation Green space	Informal Recreation area	Savannah Zone (Savannah Woodland, Grassy Savannah and Savannah shrubs)	500m / 15 mins
	13	Abuja Zoological Park	8.3 hectares	Functional Green space	Productive Green space	Remnant Farmland	Savannah Zone (Savannah Woodland, Grassy Savannah and Savannah shrubs), Wildlife and Water Feature (River flows)	500m / 15 mins
Wuse I	14	J. Berger Neighbourhood Park	9 hectares	Amenity Green space	Recreation Green space	Informal Recreation area	Savannah Zone (Savannah Woodland, Grassy Savannah and Savannah shrubs)	500m / 15 mins
	15	Zone 6 Neighbourhood Park	8.6 hectares	Amenity Green space	Recreation Green space	Informal Recreation area	Savannah Zone (Savannah Woodland, Grassy Savannah and Savannah shrubs)	500m / 15 mins
	16	Wuse Rock Park	7. 1 hectares	Amenity Green space	Recreation Green space	Informal Recreation area	Savannah Zone (Savannah Woodland, Grassy Savannah and Savannah shrubs) and Water Feature (River flows)	500m / 15 mins
	17	Oroni Garden	2.5 hectares	Amenity Green space	Recreation Green space	Parks and Gardens	Savannah Zone (Savannah Woodland, Grassy Savannah and Savannah shrubs)	500m / 15 mins
	18	Giwa Park	5.6 hectares	Amenity Green space	Recreation Green space	Informal Recreation area	Savannah Zone (Savannah Woodland, Grassy Savannah and Savannah shrubs)	500m / 15 mins
Wuse II	19	Afro-asia Garden	3.1 hectares	Amenity Green space	Recreation Green space	Parks and Gardens	Savannah Zone (Savannah Woodland, Grassy Savannah and Savannah shrubs) and Water Feature (Water pools and Water fountains)	500m / 15 mins
	20	Abuja Neighbourhood Park	7.8 hectares	Amenity Green space	Recreation Green space	Informal Recreation area	Savannah Zone (Savannah Woodland, Grassy Savannah and Savannah shrubs)	600m / 15 mins
	21	City Park	12.8 hectares	Amenity Green space	Recreation Green space	Informal Recreation area	Savannah Zone (Savannah Woodland, Grassy Savannah and Savannah shrubs)	500m / 15 mins
	22	Lobito Crescent Park	29 hectares	Amenity Green space	Recreation Green space	Informal Recreation area	Savannah Zone (Savannah Woodland, Grassy Savannah and Savannah shrubs)	600m / 15 mins
	23	Shagari Park	3.5 hectares	Amenity Green space	Recreation Green space	Informal Recreation area	Savannah Zone (Savannah Woodland, Grassy Savannah and Savannah shrubs)	500m / 15 mins

5.2 Typology of the available Green Space

As stated in the literature review, there are four main typologies of urban green spaces according to Dunnett et al. (2002). As it is adopted in this research, the typology in the Abuja case include the Amenity Green space, the Functional Green space and the Semi-natural habitat and have been identified alongside the Table 2 above in Figure 7 depicting the Abuja green spaces However, three typologies were identified from the reproduced map of the Abuja green spaces of the Phase I of Federal Capital City (FCC). Under the identified typologies of Abuja green spaces are the categories in which each green space falls into. The categories include the Institutional grounds, Recreation Green spaces, Productive Green spaces and the Wetlands. Subsequently, the categories of the green spaces have been graphically represented in Table 2.



KEY	
1	National Arboretum
2	Secretariat Park
3	Durban Street Neighbourhood Park
4	National Children Park and zoo
5	IBB Golf Course
6	Maitama Neighbourhood Park
7	Millennium Park
8	MFCT Fishery
9	Bulet Park
10	Glaval Park
11	Abuja Park
12	Recreational Park
13	Abuja Zoological Park
14	J. Berger Neighbourhood Park
15	Zone 6 Neighbourhood Park
16	Wuse Rock Park
17	Oroni Garden
18	Giwa Park
19	Afro-asia Garden
20	Abuja Neighbourhood Park
21	City Park
22	Lobito Crescent Park
23	Shagari Park

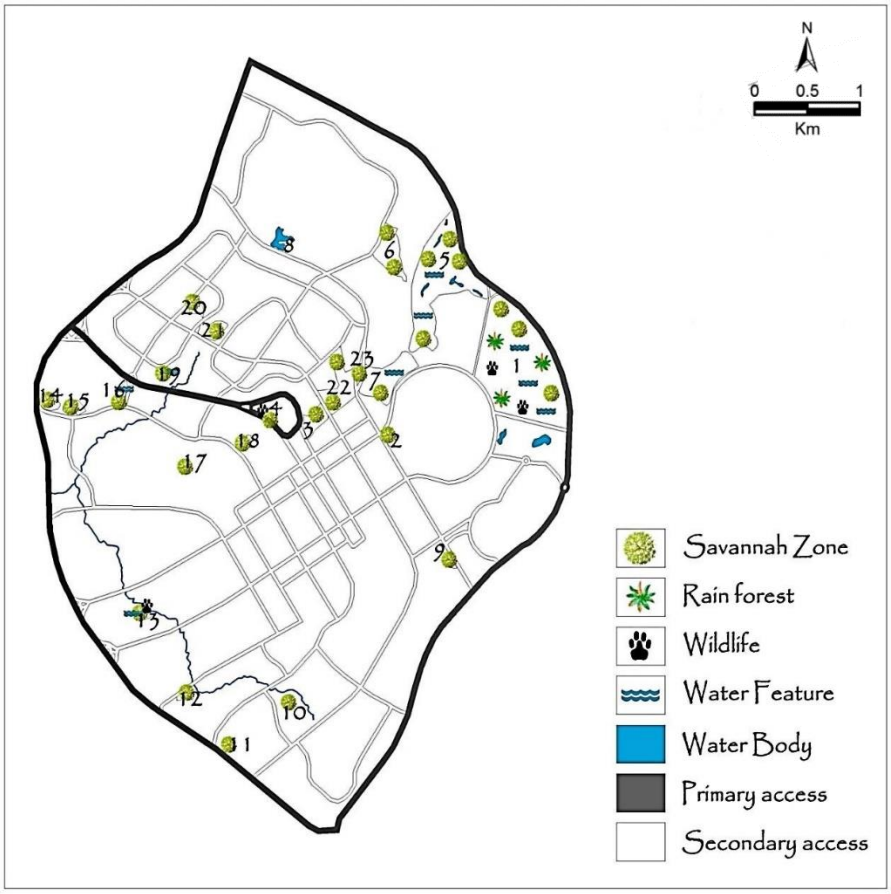
Figure 7. The map of typology of green spaces in phase I of Federal Capital City (FCC), Abuja according to Dunnett et al. (2002)

5.3 Ecological Zones of the Green Spaces

Figure 8 is an illustration of the natural existing components that make up the vegetation in Abuja environs. This Savannah zone comprises the combination of woodlands, scattered trees, wet flush vegetation and grasslands. However, traces of rainforest also exist within the green spaces to fit into the natural environment usually to house various biodiversity. The Savannah zone encompasses all the existing green spaces within the Phase I of the Federal Capital City of Abuja being identified in the maps and various representations.

In the case of the existing wildlife and domestic animals, some green spaces have created havens to house such. The havens add an extra feature to the Abuja green spaces in which they occur. There is an encouraged preservation and conservation towards biodiversity through the green spaces. Wildlife exists not only for tourism and recreational purposes but also as part of the natural environment that should regarded as natural

heritages in any environment they are. Wildlife and domestic animals are being preserved within National Children's Park & Zoo (4) and Abuja Zoological Park (13).

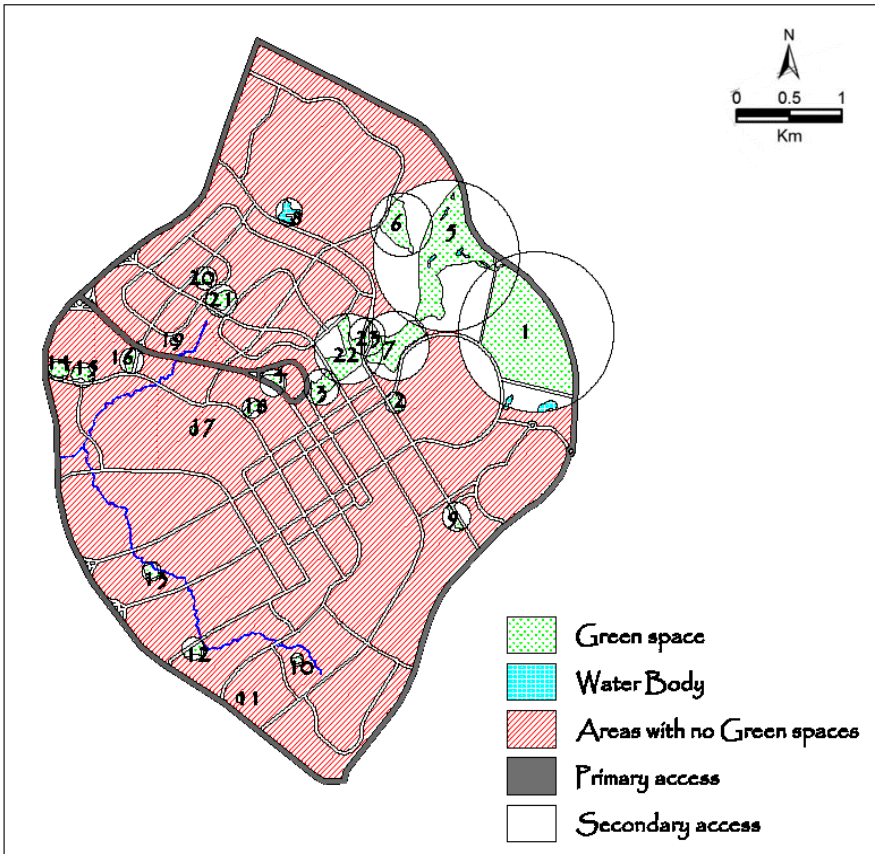


KEY	
1	National Arboretum
2	Secretariat Park
3	Durban Street Neighbourhood Park
4	National Children Park and zoo
5	IBB Golf Course
6	Maitama Neighbourhood Park
7	Millennium Park
8	MFCT Fishery
9	Bulet Park
10	Glaval Park
11	Abuja Park
12	Recreational Park
13	Abuja Zoological Park
14	J. Berger Neighbourhood Park
15	Zone 6 Neighbourhood Park
16	Wuse Rock Park
17	Oroni Garden
18	Giwa Park
19	Afro-asia Garden
20	Abuja Neighbourhood Park
21	City Park
22	Lobito Crescent Park
23	Shagari Park

Figure 8. The map of natural features within green spaces in phase I of Federal Capital City (FCC), Abuja

5.4 Neighborhood Access to Green Space

As palpable in Figure 9, the circled portion (around the Abuja green spaces) represents the distances in six hundred metres (600m) / fifteen minutes (15 mins) walk of the green spaces to the immediate built environment and its surroundings with reference to the accessible green space standard developed by Bristol City Council (2008) The vast portion in the map which is represented in red (according to the legend) is the part of the layout without obvious green space.



KEY	
1	National Arboretum
2	Secretariat Park
3	Durban Street Neighbourhood Park
4	National Children Park and zoo
5	IBB Golf Course
6	Maitama Neighbourhood Park
7	Millennium Park
8	MFCT Fishery
9	Bulet Park
10	Glaval Park
11	Abuja Park
12	Recreational Park
13	Abuja Zoological Park
14	J. Berger Neighbourhood Park
15	Zone 6 Neighbourhood Park
16	Wuse Rock Park
17	Oroni Garden
18	Giwa Park
19	Afro-asia Garden
20	Abuja Neighbourhood Park
21	City Park
22	Lobito Crescent Park
23	Shagari Park

Figure 9. The map of distances of green spaces and areas with no access to green space within phase I of Federal Capital City (FCC), Abuja

5.5 Cases of Land Contravention and change of use

It is worthy of note that from the projections of the Abuja master plan, the green spaces were allocated a certain percentage in the overall layout. The analysis of the final report from the ministerial committee which was set up by the Federal Government of Nigeria on the investigation of misappropriated plots of lands that were designated for green spaces within Federal Capital Territory (FCT), demonstrated that there are tremendous cases of changes of land use from 1996 to 1998 (FCDA, 1998) and it has been illustrated in Table 3 below.

Table 3. Distortions in the Implementation of Abuja Master Plan Phase I (MFCT, 2003)

TYPE OF DISTORTION	NUMBER OF PLOTS
Encroachment into Green Areas	84 plots subdivided and allocated as residential 30 neighborhood parks converted to corner shops
Encroachment on Sewer lines	70 plots
Encroachment on Water pipelines	166 plots
Encroachment into highway corridors	216 plots
Development of residences on plots allocated for educational institutions	22 plots

Table 4. Cases of Land Use Contraventions (FCDA, 1998)

District	Cases of Contraventions	Conversion of land allocated to open spaces and green areas over the period in hectares
Central Area	4	20.72
Garki	8	42.49
Asokoro	7	28.87
Wuse	11	89.12
Maitama	21	86.85
Total	51	268.05

6. Discussion

Abuja is Africa's fastest growing city. The urbanization rate in Abuja is at an alarming rate of 8.32% per annum. Africa (Myers, 2011). To respond to the allied challenges of the unforeseen congestion, there has been spatial developments in the city over the years. This spatial development has interfered with the initial provision of green spaces in the city. Not only has the incessant development interfered, the green spaces left in the city cannot support the available population today.

As demonstrated in the result in figure 6**,** there has been disappearance of more than 70% of the designated and undesignated green space. Although, the categorization in the Master Plan is according to developed and undeveloped green spaces, in any case, both are almost gone. Table 2 shows the existing green space, the sizes and the distance from each neighborhood in each case. In cases where the designated spaces such as national parks are still available, the sizes have reduced considerably due to the need for spatial development. Also, the imminent results are the degradation of the existing natural habitat as well as the entire ecological systems within it as demonstrated in figure 8. Furthermore, according to **figure 9,** almost all the neighborhoods lack decent access to green spaces due to the change of use of the green space to satisfy the quest for spatial development.

The other prominent problem is from the illegal land administering and land-use misappropriations involved in the developments of the city as well as informal settlements being enacted within the Federal Capital City (FCC) of Abuja. Table 3 and 4 illustrate cases of changes of land use and contraventions. This include change of use of designated green space to satisfy personal quests by authorities. The table further demonstrated the number of case and the hectare of land which were converted in each case. The rapid increment in the Abuja population and unrestrained misuse of the natural resources result in greater peril to the urban sustainability of the city.

Lastly, the informal open ended interview conducted with the staffer of the Abuja Geographical Information Systems (AGIS) also buttressed the fact that disappearance of the green space is due to change of land use so as to address the challenges caused by the unforeseen urban population. In other to fully implement the proposed Abuja Master Plan, the Federal Government of Nigeria established agencies in various service levels to facilitate a comprehensive development to the new capital city. At the helms of the affairs of all jurisdictions in Abuja are the Federal Capital Territory Administration (FCTA) and a FCT minister to oversee the entire welfare of Abuja, the Federal Capital Territory (FCT) of Nigeria. Also, there was an enactment of a continuum of land use policies such as the 1978 Land Use Act, the 1992 Urban Development Policy, the 1992 Urban Regional Planning Act, the 2002 Housing and Urban Development (Alabi & Akinbode, 2010; Olajuyigbe & Rotawa, 2011), there is nevertheless a consistent disappearance of green spaces in this city. It was therefore gather that, these are policies which are slated to protect this green space, however, there is lack of political will to implement this policies. As usual in third world countries, there

are always an ontological rupture between policies on paper and its implementation and this due to the overarching effects of corruption.

7. Recommendation

With the emphasized discussion noted, some recommendations have been derived. These recommendations include:

1. Reorientation of natural environment and the benefits of green cities

There is need for public re-orientation about the benefits of green spaces in urban layouts. Programmes can be established by the land administrators to sensitize the Abuja residents as way of awareness for the consciousness of environmental impacts of nature and green spaces. The sensitization can also be included in the curriculum of schools other institutions. Also, awareness campaigns can be done to brief the inhabitants on the processes of the land use acts and the remunerations of environmentally composed cities. It is of clarity that the outcomes of this research could be beneficial for impending developers and civic workforces when generating strategies and planning resolutions of green spaces for a sustainable city.

2. Effective administration by government and land agencies

A better effective and efficient development of green spaces can be achieved by applying good governance to the land administration sectors of Abuja in which the Federal government is being accountable to all the inhabitants of Abuja. Also, the stakeholders are inclusive as they play roles in the various representations of the policies to be implemented. The advancement and preservation of the green spaces all depend on the government authorities and land administration parastatals.

3. Delegation of Responsibilities

The Federal Capital Development Authority (FCDA) participated in the initial projection of the proposed master plan for Abuja and they should be entrusted with autonomy to implement the responsibilities of the development of the natural environment. Not all the agencies should have this privilege as they should work under the control of FCDA not as independent bodies.

In addition, the FCDA should set up periodicals to review the implementation and policies that affect the land use purposes of the Abuja master plan. Their computerized information should be more accessible and more inclusive so that individuals can review the land uses from time to time. Also, a detailed land use review noting all the expansions existing within Abuja should be studied and reviewed on basis. In the quest to institute sustainability of the environment and preservation of green spaces, the authorities should retain a database of tangible and prospective green spaces classified according to landscape and environmental principles.

8. Conclusion

Due to the changing socio-economic situations, cities in developing countries are faced with the challenge of managing unforeseen populations and congestions. Therefore, among others, preservation of urban green space would determine how developing cities respond to the many allied challenges of increasing populations in years to come. In this vein, this research investigated the overview of green spaces in Abuja, the Federal Capital City of Nigeria which is the fastest growing city in Africa. To respond to the surging urbanization, there has been an unsustainable encroachment on designated green space in the urban area. Despite the enactment of policies and creation of governmental parastatals, there is nonetheless a consistent decline of the green spaces. Through the methodology used in documenting the status quo of the green spaces in this research, it was realized the available green spaces are no longer evenly distributed in the city and the areas covered by the existing green spaces are not enough to accommodate the population of

residents in Abuja. These occurrences have been represented in the various reproduced maps of the green spaces within Phase I of Federal Capital City (FCC).

Therefore, the implementations of policies which guides land use in Abuja has procured prime significance. The implementation of policies and planning for the new for the surging population would be a contributory solution in this specific case. Furthermore, at this phase of the development of the capital city, the restoration of the green spaces is still possible if the status quo is adequately understood. Research over the years have demonstrated how green spaces could be artificially created, therefore, it is incumbent of the planning authorities to research on best practices and implement them in the Abuja case.

In conclusion, this research demonstrate the disappearance of green spaces in Abuja as a cautionary case for future cities in developing countries. Similar cities in its development phase in developing countries should adequately plan for unforeseen population growth and effectively demonstrate the impact of loss of green space to the public at the planning phase of each city.

Acknowledgement

We acknowledge the contributions of Asst. Prof. Dr. Payam Mahasti of the department of Architecture, Cyprus International University, Haspolat, North Cyprus.

Reference

Abubakar, I. R. (2014). Abuja city profile. Cities, 41, 81-91.

Abdullahi, B. C. & AbdAziz, W. N. Z. (2010). Nigeria's Housing Policy and Public Private Partnership (PPP) Strategy: Reflections in Achieving Home Ownership for Low-Income Group in Abuja, Nigeria. Presented at urban dynamics & housing change-crossing into the 2nd decade of the 3rd millennium, 4–7 July, Istanbul.

Abubakar, I. R. (2012) Household Coping Strategies with Unsatisfactory Urban Services in Abuja, Nigeria. Presented at Association of American Geographers 2012 annual meeting, February 24–28, New York, USA.

Abubakar, I. R. & Doan, P. L. (2010). New towns in Africa: Modernity and/or decentralization? Presented at the African studies association 53rd annual meetings, November 18–21, San Francisco, USA.

Abuja Geographic Information Systems (2013). Land administration: Fresh land application procedure. http://www.agis.fct.gov.ng/land_admin.html Retrieved December 05, 2014

Akingbade, A., Navarra, D., Zevenbergen, J., & Georgiadou, Y. (2012). The impact of electronic land administration on urban housing development: The case study of the Federal Capital Territory of Nigeria. Habitat International, 36(2), 324–332.

Alabi M. O., & Akinbode A., (2010). Towards Effective Physical Planning in Local Governments in Nigeria. Environmental Research Journal, 4(2), 173-176.

Alberti M., (2008). Advances in Urban Ecology: Integrating Humans and Ecological Processes in Urban Ecosystems. Springer US, New York, United States of America. ISBN: 978-0-387-75509-0.

Amba, K. (2010). The Need for Popular Participation in Abuja: A Nigerian Story of Informal Settlements. Journal of Place Management and Development, 3(2), 149–159.

Benna Associates (2009). Abuja master plan review: Socio-economic surveys, analysis and recommendations – Final report. Technical report submitted to FCDA, Abuja.

Bolund P. & H. Sven, (1999). Ecological Services in Urban Areas. Ecological Economics, Vol. 29, pp. 293-301.

Boyd, D. (1997) 'Why a Course on Indicators for Sustainable Development?', in International Institute for the Urban Environment (ed.), Advanced Study Course on Indicators for Sustainable Urban Development (Delft, Netherlands: Nivo).

Brinkyte E., (2013). Urban Green Space System: A Case Study of Siauliai City. Siauliai University, Lithuania, 1(10): 30-41.

DeWolf T., (2009). Do Green Spaces Have an Effect on Social Capital within Communities? http://westsidebinghamton.org.Retrieved July 22, 2015

Dunnett N., Swanwick C. and Woolley H., (2002). Improving Urban Parks, Play Areas and Green Spaces. Dept. for Transport, Local Government and the Regions, London. pp. 8 (4) and pp. 16 (40).

Felce D. and Perry J., (1995). Quality of Life: Its Definition and Measurement. Research in Developmental Disabilities. DOI: 10.1016/0891-4222(94)00028-8.

Goede, E., C.A. Rodenburg, E.S. van Leeuwen and P. Nijkamp (2001) Development of Urban Green Spaces to Improve the Quality of Live in Cities and Urban Regions: Economic Criteria (EVK4-CT-2000-00022, 7; Amsterdam: Economic and Social Institute).

Heidt V. and M. Neef, "Benefits of Urban Space for Improving Urban Climate," Ecology, Planning and Man-agement of Urban Forests: International Perspective, 2008.

Hough, M. (1984) City Form and Natural Processes (London: Croom Helm)

IPA (International Planning Associates) (1979). The Master Plan for Abuja, the New Federal Capital of Nigeria. FCDA, Abuja: Nigeria.

Ilesanmi, I. J. (2006). Pre-feasibility Assessment of Onsite and Decentralised Sanitation Systems for New Satellite Settlements in Abuja, Nigeria. PhD dissertation, Hamburg University of Technology.

Iro, I. (2007). Demographic pressure and the application of GIS in land reforms: The case of restoration of Abuja Master Plan and sanitization of cadastral and land registry. In Proceedings of map middle east conference on GIS development, Dubai, UAE.

Jibril, I. U. (2006). Resettlement Issues, Squatter Settlements and the Problems of Land Administration in Abuja, Nigeria's Federal Capital. In 5th International federation of surveyors regional conference, March 8–11, Accra, Ghana.

Kellet, J. and Rofe, M. (2009), Creating Active Communities: How Can Open and Public Spaces in Urban and Suburban Environments Support Active Living? (Adelaide: Institute for Sustainable Systems and Technologies, university of South Australia).

Kuti, Oluwaseun, M. (2015). The Role of Green Spaces in Urban Areas: A Case Study of Federal Capital City, Abuja, Nigeria. Department of Architecture, Cyprus International University. Unpublished Master Thesis

Le Corbusier, (1929). The City of Tomorrow and its Planning. John Rodker, London.

MacHarg, I.L. (1971) Design with Nature (Garden City, NY: Doubleday).

Myers, G. A. (2011). African cities: Alternative visions of urban theory and practice. London: Zed Books

OECD (Organisation for Economic Co-operation and Development) (1993) OECD Core Set of Indicators for Environmental Performance Reviews: A Synthesis Report by the Group on the State of the Environment (Environment Monograph 83; Paris: OECD).

—— (1998) Towards Sustainable Development: Environmental Indicators (Paris: OECD). Priemus, H. (1999) 'Sustainable Cities: How to Realise an Ecological Breakthrough: A Dutch Approach', International Planning Studies 4.2: 213-36.

Ojo, V. O. (2011). Customer satisfaction: A framework for assessing the service quality of urban water service providers in Abuja. Doctoral thesis, School of Civil and Building Engineering, Loughborough University.

Olajuyigbe A. E., & Rotawa, O. O., (2011). Optimizing Physical Planning in the Developing Countries- A case Study of Ondo State, Nigeria. Sustainable Development, 4(4), 202-209.

Poëte M., (1913). La promenade à Paris au XVII esiècle. L'art de se promener – Les lieux de promenade dans la ville et aux environs (The Paris promenade of the 17th century. The art of walking – The place of the walk in the city and its surroundings). A. Colin, Paris, (in French).

Rodenburg, C., Baycan-Levent, T., Van Leeuwen, E., & Nijkamp, P. (2001). Urban Economic Indicators for Green Development in Cities. Greener Management International, (36).

Rotmans, J. (1997) 'Indicators for Sustainable Development', in J. Rotmans and B. de Vries (eds.), Perspectives on Global Change: The TARGETS Approach (Cambridge, UK: Cambridge University Press): 187-204.

Silva, A., & Roders, A. (2012). Cultural heritage management and heritage (impact) assessments. In Proceedings of the Joint CIB W070, W092 & TG International Conference: Delivering Value to the Community (pp. 23-25).

Sorensen M, J. Smit, V. Barzetti and J. Williams, "Good Practices for Urban Greening," Inter-American Develop-ment Bank, 1997. http://www.iadb.org/sds/doc/ENV109KKeipiE.pdf. Retreived on July 07, 2015

Tuzin, B., Leeuwen, E., Rodenburg C., & Peter, N. (2002). Paper presented at the 38th International Planning Congress on "The Pulsar Effect" Planning with Peaks, Glifada, Athens, 21-26 September 2002.

Umoh, N. (2012). Exploring the enabling approach to housing through the Abuja Mass Housing Scheme. Doctoral dissertation, Massachusetts Institute of Technology.

Urban Green Environment (URGE) Team, (2004). Making Greener Cities: A Practical Guide. Leipzig-Halle: UFZ Centre for Environmental Research. Retrieved from http://www.urge-project.org.No. 8/2004.

Valk A. and van Dijk T., (2009). Regional Planning for Open Space. Routledge publishers; London and New York. Pp. 249-278.

van Delft, Y. (1997) 'An Introduction to Indicators and Monitoring', in International Institute for the Urban Environment (ed.), Advanced Study Course on Indicators for Sustainable Urban Development (Delft, Netherlands: Nivo).