

Urban Growth and Sustainable Development of the Built Environment in Abuja Metropolis

UNAH, M. O.

Department of Architecture, Faculty of Earth and Environmental Sciences, Bayero University, Kano.

Corresponding author E-mail: unahkay@yahoo.com;

Tel: 08050207114

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Abstract

Rapid urban growth in the federal capital of Nigeria in the last two decades has more effect on the development changes that characterized the cosmopolitan city. This has put enormous pressure on the built environment, where urban construction and transformation are taking place. The paper assessed urban growth and sustainable development of the built environment in Abuja. Its causes and consequences were investigated with respect to five {5} districts that make up the metropolis. The approach to this research is urban environmental sustainability in defining developmental change patterns for quality of the built environment research is presented, and a number of key performance indicators variables were examined. Seventy five (75) questionnaires were distributed to purposive respondents and Sixty- nine (69), accounting for 92% of the number of distributed questionnaires were retrieved and employed for data analysis. The research collected data using a uni-variated analysis on 31 rated likert of a five-point scale. Using descriptive and inferential statistics techniques, the sum weighted score (SWS), mean weighted score (MWS) and Relative Importance Index (RII) rating was obtained. Four major findings were discovered. Firstly, the predominantly building development skyline were for commercial services (MWS= 3.88). Secondly the factor of change in urban growth revolves around public building use and redevelopment of residential properties involving Increase property/Rental Value (MWS= 3.68). Thirdly the major determinants of urban growth were identified as social, economic and spatial political factors as demolition of satellite settlement (MWS=3.35) and lastly non adherence to managerial practices of building regulations enforcement and its implementation in construction. The noticeable consequences had been planning regulation/ provision (MWS=3.14) among others. The study recommended that property developer and stakeholder should adhere to designated master plan implementation and control measures while policy makers should focus more on meeting contemporary urban challenges such as rapid urbanization, balance between economic development and urban sustainability as well as environmental change.

Keywords: Built-environment, Sustainable development, Urban Growth, Housing Redevelopment,

Introduction

The United Nation Report had shown that global urban population has quadrupled since 1950 and cities of the world now account for over 90 percent of the urban growth (Momoh, Busta and Medjoudoub 2018). City growth and development planning has consistently underestimated the pace of urban growth in the built environment. Unah and Ibrahim (2019) posit that the growing number and complexity of human activities have necessitated a critical assessment of the Federal Capital Territory Abuja. He noted further that city growth is characterized by rapid building development and redevelopment involving renovations / rehabilitations and modifications / alterations (Unah 2019) which look at the City metropolis as an opportunity enabling environment to the advantage of business to strife. Ikoku (2004) aver the Master Plan had adopted a phased development programme to formally accommodate and provide for orderly urban growth and change but development focus and priority schedule had been altered drastically. Despite major shifts in development thinking in the last two decades, Abuja the Federal Capital of Nigeria has experienced rapid urban growth in a formerly agrarian community, were largely designated residential settlement were

being converted to commercial purposes. Although little effort was made on the varying menu of proposed policy remedies to stem the ultimately attempts to plan and regulate urban spaces in Africa and especially Nigeria since independence but most part has constituted a litany of failure (Mabogunje 1990).

UN-Habitat (2014a) avers that Africa leaders and political elite are taking hinder the development of existing urban conditions and their desire to leapfrog over the overcrowding and the dilapidated condition of housing and infrastructure in existing large urban centers. Urban growth and development of the built environment has continually face fundamental issue in the federal capital city. The rate at which the number of building conversion in the urban spaces continues to increase is tremendous and unable to achieve a successful metropolitan sustainability. Ikoku (2004) opined that the rest of the composition of the Central Area has changed considerably and detrimental to the proper functioning of the capital as the nation's public space. (Unah 2019) opt that the rising number of population has continue to encourage city growth and expanding standard of living profit. The redevelopment of existing settlement which give rise to demolition of existing building or redesigning/ has continue to into a higher demanding use. This urban growth and mis-management of the city has effects on the number and complexity of human activities. These have necessitated a critical assessment of citybuilt environment. Thus, the need to increased focus on environmental quality and sustainability, right of the physical challenged, effect of traffic and transport in the city's efficiency, growing emphasis on the private sector, and demand in building renovation/ rehabilitation, modification/ alteration (Unah 2019, Unah 2021), increasing building floor Level, developing additional structure on plot (Unah and Ibrahim 2019). All this has led to its effect on new lifestyles, Increasing property/Rental Value, Pressure on Urban Infrastructure, Cityscape distortion, Overpopulation, Increase water scarcity, Low voltage electricity, Traffic Congestion and Pollution (Land, Air /Water) and Tenure Insecurity respectively.

Un-designated urban land / building or development conversion is one of the many critical factors that determine the poor quality of the urban environment and by extension, impeding adequate developmental and sustainable growth. This change constitute nuisance and may gradually hinder effective functions of both human and building activities in the cosmopolitan city. The resultant negative consequence tends to have adverse effect on the immediate environment. The motivation of government law enforcement agencies and private bodies can be triggered through investigation into the causes and impacts of constant building conversion especially in built-environment which justified the urgent needs for this study. The study aims to assess urban growth and sustainable development of the built environment. The objectives of the study are to: identify and examine features for assessing urban growth impediment sustainability; and identify key factors and implication on the built environment, towards identifying areas for improvement and interventions in managing such development in future.

Urban growth and sustainable development of Abuja

Adeponle (2013) posit eight objectives of the master plan of Abuja. Five deals essentially with environmental issues, which required that the new capital city is expected to conserve the natural and cultural environment of the territory for which it was design for, as the vision of the fore father (FCDA, 1979). The resultant Master Plan was prepared in a way that land use, infrastructure housing, transportation, recreation, economic and social services are coordinated and inter-related. (Abba, 2003).The rate of urbanization in the postcolonial growth of Nigeria new capital city and the activities of successive Military governments have neglected these fundamental principles. As such, series of distortions to the concept, direction and implementation of the master plan are prevalent today, even till now overwhelming their long range, comprehensive modernist plans and is too flexible in accommodating their rapid changes. Being it urban growth or renewal, (Goodfellow 2013, Unah and Ibrahim 2019, Unah and Murtkar 2020) opined that the problem of how to plan for urban expansion and implement regulations over the use of scarce, valuable and environmentally strained, urban land is increasingly being converted, redevelopment and Modification on the environment (Unah 2019). While Abuja Master Plan envisaged the population of Abuja to reach 1.64

million by 2000 (IPA 1979), the city's estimated day-time population is up to seven million people (Iro 2007) as cited by Abubakar and Doan (undated). Adeponle (2013) posit that the city was designed as an efficient and attractive environment at each stage of its growth –from Phase 1, which was designed to accommodate 230,000 residents through Phases II and III, which were to accommodate 585,000 and 640,000 respectively, to Phase IV aimed at accommodating 1.7 Million. According to the 1991 population census (Provisional figures), the population of the FCT was 378,671 and Year 2000 projections were put at well over half a million. Phase II of Abuja's development is yet to be completed. Okoro (2014) posit that the course of implementing and challenges in logistics, technical capacity and paucity of funds and to some extent political will in management of these sustainable growth has made it difficult for plans to be realized as originally envisaged the potential and implementation that planning and urban development hold for African cities and Nigeria particularly.

The concept of Abuja as a befitting Federal Capital Territory, where the city was to serve as the Nigeria's 'symbol of greatness' (IPA 1979), has resulted on the Master Plan which was prepared in a way that land use, infrastructure, housing, transportation, recreation, economic and social services are coordinated and inter-related (Unah and Ibrahim, 2019, Ikoku 2004)). Abba(2003) apt that out of the eight objectives of the master plan of the city, five deal essentially with environmental issues which is expected to conserve the natural and cultural environment of the territory. But as such, series of distortions to the master plan concept has hinder policies direction and implementation. The growth and management of a developing city takes into cognizance decision-making that takes into account sustainable economic, ecological, and social impacts that seeks to improved public health and a better quality of life for all its residents. This will limit waste, prevent pollution, maximizing the conservation of city skyline which is dotted with modern architecture, wide roads and beautifully landscape. Abubakar (2014) opined that the 2006 review of Abuja Master Plan by an international consultant focused on the review of the city's land use plans, central area design without restraining illegal developers and demanding pro-activeness, courage and professionalism in the way development control carry out their assignments, adverse effects of unplanned land use in building redevelopment. Abubakar and Doan (undated) opined that, African cities were designed largely by modernist master planning approach to relieve the population pressures on urban decay that most developing countries are facing. These challenges inclusive of loss of community, economic viability, environmental pollution, deteriorating infrastructures, social disintegration, crime and violence, urban blight, and population growth. It also represents the hindrance in maintaining quality of life while facing resource limitations, and increasing population growth. The study of Nkolika, *et al.* (2018) avers the spatial use of land for the locating various interconnectivity activities is more stressed to the inhabitant of a place than the net production capability. Unah (2019) study of Asokoro Abuja, posit that city redevelopment and access to land in the built environment has become part of the larger urban growth orchestrated by increase challenges of large-scale public acquisition of properties and opportunity for unplanned redevelopment of residential buildings to commercial development, building redevelopment as well as modification on the utterance of the built environment (Unah and Ibrahim 2021). This urban renewal has resulted in it urban problems such as pollution, overcrowding, poor environmental sanitation, traffic congestion and high crime rate. Nkolika, *et al.* (2018) further stressed that the continuous desires at maximizing economic returns as well as the urgent request to accommodating new physical re-development of the built environment by local planning authorities necessitates the changes in land use pattern, which does not always lead to positive impacts on economic growth (Adebayo 2009).

It is pertinent to note that the un-sustainable urban growth of Abuja built environment started right from inception of its master plan. This has suffered over the years from unnecessary distortions in the implementation by both civilian and military administration since 1979. This has caused several delay and eventually derailed from the principles that underlay the original conception of the new federal capital.

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Atebije and Razak (2015) posit that the technical capacity and paucity of funds and challenges in logistics, to some extent political will made it difficult for plans to be realized as originally envisaged. These constraints led to indiscriminate developments, impunity, and abuses which made the City to lose its planned form, shape, size and beauty. Ikoku (2004) posit that Abuja Phase 1 (Metropolis) comprising the Central Business Area (Commercial Core) including residential districts (Garki, Wuse, Asokoro and Maitama). The delay in carrying out the construction work of other phases as schedule earlier in the master map is responsible for the influx of crammed activities in the Capital City, and which has already exceeded the districts targeted population (FCDA, 1979). There cases of incidental designs of residential layouts / district involving redesigns mostly in areas reserved as green to meet the urgent desire for residential development as sort for by it political authors in government, such area includes, Area 10 neighborhood sport centre, now a commercial of business hub, Maitama neighborhood sport centre now converted as Maitama extension created by an ex- FCT minister Adamu Aleiro administration. This development does away the reserved neighborhoods sport center to residential area. Adeponle (2013) focus that delay in constructing the transport facilities such as transit way and introducing a rapid transit system to serve the City optimum has also led to indiscriminate encroachment upon through plot allocation in several part of the city center. Adeponle (2013) further note that duplication of the Ministry of the Federal Capital Territory (MFCT) in 1980 and its imposition on the Federal Capital Development Authority (FCDA). The former which lacked the professional personnel to understand the philosophy of a master plan and the need for detailed planning and design to be carried out before the master plan could be transformed into construction activities in any part of the City. This seems major parkway as element of open space gradually giving way to physical development in Phase 1 (Ikoku 2004). Park and Recreational task forced are instituted to reclaim these public open spaces and has carried out accelerated development as a mean of revitalizing them. Lambin and Geist (2006) grouped urban growth factors as: social and economic, the latter which make use of investment opportunities, marketability, Professional Imputes and Commercial services, Increasing property/Rental Value, Economic / Marketability are main significant factors that contributors to urban commercial growth and building conversion change in the built environment. The Social factors are individual's preferences financial and temporal including family size and structure including Tenure insecurity, location attributes, developing addition building, increase floor level, housing prices and concerned with the use of land to generate optimal economic returns. Unah (2021) posit that identifiable factors that characterized development mechanism are inconsistency of government policies; such as introduction or amendment of extant policies as well as pattern of enforcement which include resettlement/relocation, demolition of satellite settlement, Master Plan Implementation, planning regulation/ provision and land revocation. On the other hand, implications of building developmental change have been documented in literature especially on environmental quality and sustainability.

In the built environment, urban growth that requires sustainable development implications includes landscape distortion, Overpopulation, pollution, traffic congestion, urban sprawl, recreation (Garden) distortions, pressure on infrastructure facilities, traffic congestion, building population explosion, developing addition building, increase floor level (Unah 2021, Unah and Ibrahim, 2019). Jiboye (2011) posit urbanization to improved urban quality by renewing the city, optimizing urban spatial organization and improving urban function. But instead, Unah and Murtkar (2020) opined sustainable urban growth has been overwhelmed by spontaneous and uncontrolled urbanization Sustainable urban growth should be managed to administered direct bearing on its ability to support economic development, social development, health systems and mitigate poverty. Sustainability is a direction rather than a destination. According to the City of Vancouver (2002), a sustainable city is one that protects and enhances the immediate and long-term well-being of the city and its citizens, while providing the highest quality of life possible. Sustainable development requires that the stock of natural man-made, social and human capital should not decline or depreciate. Jiboye (2011) observed that rapid urbanization and poor economic growth have compounded the problems of inadequate sustainable development in Nigeria. Studies have viewed urban growth

development from different dimensions based on, the concept of it built environment. The term ‘development’ connotes positive change, expansion, growth and transformation. It should be note also that development connotes positive change as well as negative. The study chooses the latter development as portends retrogression while positive development results to progress.

Methodology

Abuja a Nigeria’s new Federal Capital Territory (FCT) was created in 1976, moving the capital out of Lagos. Spans over 8,000 km² of land mass. Abuja is bounded on the north by Kaduna state, on the west by Niger state on the east and southeast by plateau state, and on the south-west by Kogi state, and lies within latitude 9° 25’N and 9° 20’N of the equator and longitude 7° 45’E and 7° 39’E, Figures 1 and 2 show map of the Federal Capital Territory and map of Abuja respectively. Reasons stated for the relocation included, amongst others, poor topography; congestion; overcrowding with limited room for expansion given its coastal border and a decaying and polluted urban environment (Equere et al. 2021). It is envisaged that Abuja was designed to correct the faults and shortfalls of the former capital city; especially in providing enough room for orderly planned expansion.

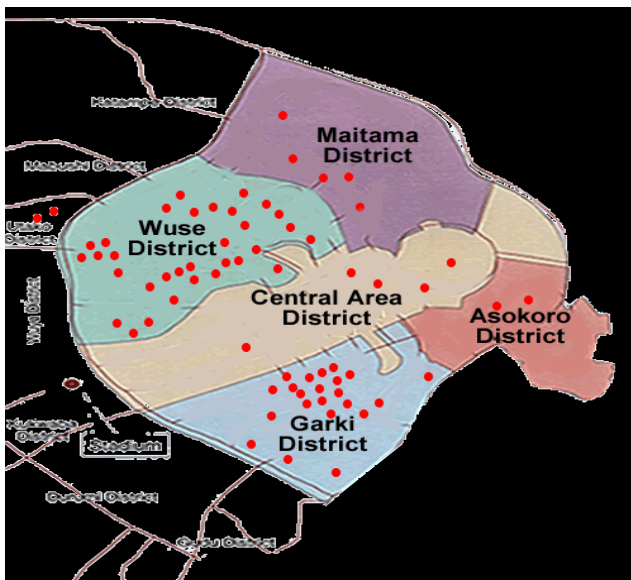


Figure 1: Map of the Federal Capital Territory Showing Planned Phases of Development
Source: Abuja Geographic Information Systems (2000)

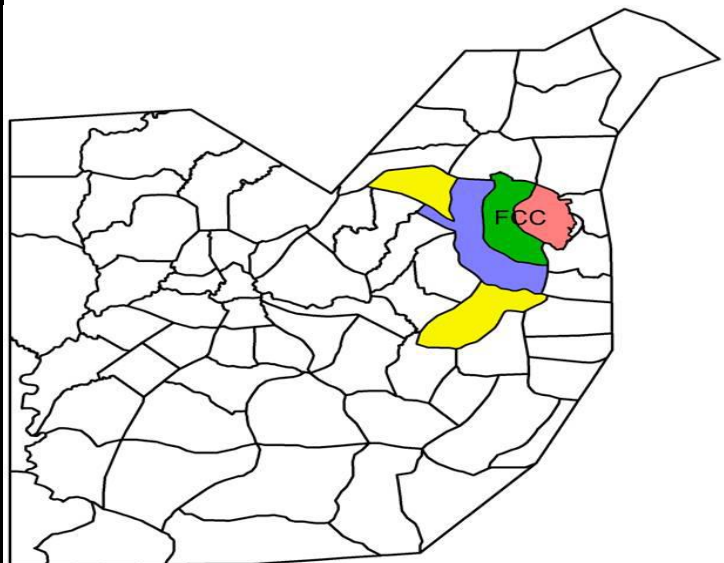


Figure 2: Map of Abuja Showing the Five Districts of Planned Phase I
Source: Abuja Geographic Information Systems (2000)

A questionnaire survey that was based on content validity and review of similar questionnaires on built environments; was employed to evaluate the factors that affect urban growth management in Abuja metropolis from residents’ perception. Seventy five (75) questionnaires targeting at five {5} districts that make up Municipal council were distributed to respondents. Sixty- nine (69), accounting for 92% of the number of distributed questionnaires were retrieved and employed for data analysis. The research uses 31 rated Likert items, where descriptive and inferential statistics techniques were used to analyze collected data gathered using the Likert scale on a five-point scale, 1 being high Positive Impact to 5, High Negative Impact. Each coded response was multiplied by number of respondents, which gave the Weighted Value (WV). The Summation of the Weighted Values (ΣWV) was divided by number of respondents (n) to arrive at each component Mean Weighted Value (MWV). The rating of all the factors for the degree of significance

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was based on the value of their respective relative importance index (RII). This is used to rank the level of Impact the respondents attached to the variables affecting the built environment.

This is mathematically expressed as

$$RII = \frac{1n_1+2n_2+3n_3+4n_4+ 5n_5}{5N} \quad (1)$$

Factors with RII of 0.7 and above were considered “*high negative Impact*” in this study. These correspond to ratings in the first quartile range (75% and above). RII values between 0.60 and 0.69 corresponding to the second quartile (50%-74%) are considered “*negative Impact*” RII values between 0.50 and 0.59 corresponding to the third quartile (25%-49%) are considered “*positive Impact*” RII values below 0.49 (fourth quartile) are considered “*high positive Impact*” Vanduhe (2012) in this study.

Table 1: Likert Scale

Range	Interpretation	quartile
0.7 - 0.80	High Negative Impact	First
0.6 - 0.69	Negative Impact	Second
0.5 – 0.59	Positive Impact	Third
0.1 0 0.49	High Positive Impact	Fourth

Vanduhe (2012)

Frequency distribution of variable under study including Mean score, Standard deviation and Percentage score for satisfaction while Relative Importance Index (RII) was used to the respondents’ scores of the built environment variables. The distribution of Standard deviation across the built environment variables indicates that the result from the study can be generalized from the study population.

Table 2. Factors Affecting the Built Environment

VARIABLES	N	SWV	MWV	STD.	RII	Rank	Interpreting	quartile
1 Commercial services	69	268	3.88	0.0562	0.78	1 st	High negative Impact	first
2 Urban Sprawl	69	268	3.87	0.5608	0.77	2 nd	High negative Impact	..
3 Renovation / Rehabilitation	69	264	3.82	0.0553	0.76	3 rd	High negative Impact	..
4 Increase property/Rental Value	69	254	3.68	0.0533	0.74	4 th	High negative Impact	..
5 Pressure on Urban Infrastructure	69	249	3.61	0.0521	0.72	5 th	High negative Impact	..
6 Resettlement/ Relocation	69	246	3.57	0.0517	0.71	6 th	High negative Impact	..
7 Modification / Alteration	69	244	3.54	0.0513	0.71	7 th	High negative Impact	..
8 Demolition of satellite settlement	69	244	3.53	0.0511	0.70	8 th	High negative Impact	..
9 Location Attributes	69	239	3.46	0.0501	0.69	9 th	Negative Impact	second
10 Landscape distortion	69	235	3.41	0.0494	0.68	10 th	Negative Impact	..
11 Cooperate offices	69	234	3.39	0.0491	0.68	11 th	Negative Impact	..
12 Overpopulation	69	233	3.37	0.0488	0.67	12 th	Negative Impact	..
13 Professional Imputes	69	229	3.31	0.0479	0.66	13 th	Negative Impact	..
14 Tenure Insecurity	69	226	3.28	0.0475	0.66	14 th	Negative Impact	..
15 Traffic Congestion	69	225	3.26	0.0472	0.65	15 th	Negative Impact	..
16 Master Plan Implementation	69	221	3.20	0.0463	0.64	16 th	Negative Impact	..
17 Parking space	69	224	3.25	0.0471	0.64	17 th	Negative Impact	..
18 Pollution (Land, Air / Water)	69	219	3.17	0.0459	0.63	18 th	Negative Impact	..
19 Planning Regulation/ Provision	69	217	3.14	0.0455	0.62	19 th	Negative Impact	..
20 Economic / Marketability	69	211	3.06	0.0443	0.61	20 th	Negative Impact	..
21 Developing addition bldg.	69	206	3.00	0.0434	0.59	21 st	Positive Impact	third
22 Land Revocation	69	201	2.91	0.0421	0.58	22 nd	Positive Impact	..
23 Religion (functions)	69	198	2.87	0.0415	0.57	23 rd	Positive Impact	..
24 unstable voltage electricity	69	194	2.81	0.0407	0.56	24 th	Positive Impact	..
25 High crime rate	69	192	2.78	0.0402	0.55	26 th	Positive Impact	..
26 Loss of Business Potential	69	180	2.61	0.0378	0.53	26 th	Positive Impact	..
27 Recreation (Garden) revocation	69	180	2.60	0.0376	0.52	27 th	Positive Impact	..
28 Building population Explosion	69	178	2.58	0.0373	0.51	28 th	Positive Impact	..
29 Increase floor level	69	173	2.50	0.0362	0.50	29 th	Positive Impact	..
30 Government offices	69	154	2.23	0.0323	0.44	30 th	High Positive Impact	fourth
31 Increase water scarcity	69	131	1.89	0.0273	0.37	31 st	High Positive Impact	..

Results and Discussion

Table 2 showed the analysis factors affecting the built environment in Abuja. From the literature, Thirty-one (31) key performance indicators were identified. Result from the survey revealed eight variables in the first quartile to be Commercial services, Urban Sprawl, Renovation / Rehabilitation, Increasing property/Rental Value, Pressure on Urban Infrastructure, Resettlement/ Relocation, Modification / Alteration and Demolition of satellite settlement were ranked 1st and 2nd 3rd, 4th, 5th, 6th, 7th and 8th with MWS= 3.88, 3.87, 3.82, 3.68, 3.61, 3.57, 3.54 and 3.53 respectively. They all have R.I.I above (0.70-0.80) see Table 1. As such are interpreted to have high negative impacts on the built environment. Unah 2019, Unah and Ibrahim (2019) opined that renovation /rehabilitation and modification/ alteration of the existing buildings are worst mode of urbanization which has negative impacts the built district Abubakar and Doan (undated) Okoro (2014) avers that government policies places much emphasis on physical design, resulting in implicit segregation of the poor from the wealthy elites and the disruption of the livelihood of the people in the informal sector. Abubakar (2014) opined that the review of Abuja Master Plan design did not restrain illegal developers and demanding pro-activeness, professionalism in the way development control carry out their assignments, adverse effects of unplanned land use in building redevelopment. Unah and Ibrahim (2019) opt that this variable (first quartile) are worst influence of urban development which has impact on sustainability of socio-economic state of the environment. Goodfellow (2013), Unah (2021) opined that the problem of how to plan for urban built environment expansion is increasingly without some degree of state control over urban physical development. The second quartile present Location Attributes, Cityscape distortion, Corporate offices, Overpopulation, Professional Imputes, Tenure Insecurity among others. They have Mean above 3.00 and R.I.I. between 0.6 - 0.69 as well being Interpreted *Negative Impact* on the built environment. Unah (2019) opined that the cityscape of Abuja skyline has given way to building redevelopment. This is premises on the fact that professional Imputes in housing re-development has such impact on the environment (Unah and Ibrahim 2019). The third and fourth quartile has: developing additional building, land revocation and Government offices having positive impact on the built environment respectively. The Mean range from 3.00-2.50 has *positive Impact* on the built environment. Jiboye (2011) posit the urbanization to improvement of urban quality by renewing the city, optimizing urban spatial organization and improving urban function.

Conclusion and Recommendations

This study establishes the need for sustainable urban growth management of the built environment. Urban growth and developmental distortion is the product of urbanization and societal development that has the potential to properly develop into a city is craved for sustainable. Urban growth is an inevitable urban regeneration and renewal that has implications on the socio-economic features of the built environment and a common societal change with constant phenomenal that takes place with time. Urban re-development has been as a change culminating from lower to higher economic use to attain optimal sustainability. The study put clearly factors like:

- i. Commercial services; redevelopment of these buildings has more pressure on the basic infrastructures, which has distorted the city skyline. The major form of urban growth development that required sustainable management in Abuja are residential land uses to public: Commercial services, urban sprawl, renovation / rehabilitation, increase property / rental value, pressure on urban infrastructure, resettlement/ relocation, building modification and alteration and demolition of satellite settlement. Location Attributes, landscape distortion, Professional Imputes, Planning regulation and Provision Master plan implementation, developing addition bldg, land revocation, recreation (Garden) revocation, Increase floor level. *These are key performing variable that are predominantly found in the first and second quartiles.*

- ii. Managerial practices are issues of great concern and have significant consequences. Government policies adversely affect lay down planning regulation that is influenced by politics change. This including Resettlement/ Relocation planned that led to Demolition of satellite town/ settlement and Land Revocation. This has limited such statutory powers of building regulations enforcement and its implementation in built environment. *The noticeable consequences had been planning regulation/ provision, master plan implementation and Recreation (Garden) revocation through various accelerated development intervention. These are mainly found in the third and fourth quartile.*

The study recommended that policymakers and private stakeholders should encourage and adhere to land use control measures to strike a balance between economic development and land administrative system to foster a sustainable urban growth. More so, there is need to conceptualized an effective and sustainable public enlightenment programmes to sensitize the residents, developers / stakeholders and government monitoring agencies to adhere to Abuja Master Plan and in accordance to land use measures implication in the built environment This measures will ensure effectively, efficiently and performance / exercise of statutory roles and functions in the built environment, economic growth and foster a sustainable urban city development

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