

Paths to Mixed-Function for Sustainable Development of Peri-Urban Settlement of Kabuga Kano, Nigeria.

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ABSTRACT

Over the past years Kano metropolis and its peri-urban settlement has constantly been urbanized with path to mixed-functions development of emerging high density vertical architecture of public buildings which by location has enhanced and induced proper sustainable urban smart growth and renewal that has taken the center stage to improvement of the socio-economic activities of the built environment at the detriment of land-use conversion as a consequence of urban planning. The paper aimed at assessing mixed-function development in Kabuga and its peri-urban fringe environs. The study comprised of two stages- the first phase collected data from respondents using questionnaires to rate their level of satisfaction with key aspects of the predominance conversion of mixed-function development types, direction of predominant development conversion and implication, while the second phase collected data based on non-participant observation schedule and several field survey that dwelt on the appraisal of the effectiveness of mixed-function development. Data were collected and analysed using descriptive and inferential statistics and were presented using mean weighted score (MWS) as an indicator and scoring system criteria derived based on likert-type scale 1-5 to measure respondent's degree of satisfaction significance and standard deviation (STD) rank on their Relative Importance Index (RII). The study concludes by recommending ways to ensure orderly development of the study area in order to sustain and improve its serviceability that will enhance effective development mechanism and eventually create a conducive living, working and recreating environment.

Keywords: Architecture, Mixed-function development, sustainability built environment, Kabuga, peri-urban

1. INTRODUCTION

Kano metropolitan city is one of the fastest changing/ developing city of the sub-Saharan Africa. This city has undergone massive urbanization and transformations in the past century due to its long trans-Saharan trade route, and serves as the epic-center and commercial hub of northern Nigeria. Kano metropolis and its peri-urban settlement of this ancient city has been characterized by mixed-function development of sustainable rapid development of its built environment (Unah, 2021a). The growth of Kabuga has remained one of the most sustainable transformation whose development outside the ancient walled city has continued to experience predominance conversion of mixed-function development buildings type that has witnessed rapid urban expansion and renewal of smart growth from green open spaces (Maiwada, 2014, 2016, Unah and Abubakar-Kamar (2020)). The conversion of its open arid spaces has been replaced by contemporary building construction both horizontally and vertically structures from Residential to Commercials (Unah, 2019, 2020). Zakka *et al.*, (2017); Unah *et al.*, (2024) opted that the impact of sustainable development is due to increase in demographic size over the years and whose towns and fringing settlement have developed as a result of myriad political and economic reasons. Dankani and Abubakar (2011) opined that are due largely to the fact that they have materialized ahead of any systematic movement towards modernization. Unah (2022, 2021b) posited that the full impact of urbanization pressures has led to the rapid pace of globalization and economic restructuring and infrastructural development of Kano dated from the colonial era. However, the sustainable development of Kabuga has been induced by urbanization which has continued to improve other suburban areas. This outskirts ancient walled city settlement faced contemporary architectural buildings and expanding residential development that engulfing into

Arial of agricultural lands, conversion and encroachment of communities land (Unah, 2019) open green spaces (Maiwada, 2014), encroachment of public land into commercial use and optimizing urban smart growth, compact peri-urban organization of improving the built environment. The development of Kabuga has taken a center stage in the new urbanism as sustainable development has been a path-way to the mixed- function that fulfill multi-uses in the provision of high rise architectural buildings of plazas, malls, shopping complexes, departmental stores, furniture sales outlet, pharmaceutical stores (Gambo, 2014) and services the provision variety of eateries\restaurant, entertainment center and venues for games arcades. This structures provides integrated development of high sustainable mixed functional buildings that encompasses leisure with locals' sit-out that embed in the people culture as way of life, a form of mixed income building (Thwala and Aigbavboa, 2015). The vertical growth is being facilitated by advance in building construction (Unah *et al.*, 2024, Herndon, 2011), of Spontaneous development of more horizontal structures building being facilitated by mixed function development that has effects on number and complexity of it natural environment.

However, the problems of the large cities of developing countries are confronted with the implication / consequence of rapid decreases amount of agricultural farmland needed around the city to feed it inhabitants. The sustainable development of Kabuga has been induced by urbanization which has continued to improve other suburban areas. This outskirts ancient walled city settlement faced contemporary architectural buildings and expanding residential development that engulfing into arial of agricultural lands, conversion of communities land (Unah, 2019) open green spaces (Maiwada, 2014), encroachment of public reserved vegetative enclaves (Unah, 2022b) land into commercial use and optimizing urban smart growth, compact peri-urban organization of improving the built environment. Adebayo (2009) averred that changes in land use have positive impacts on economies and growth. Although, the externalities of changes in the functions of the built environment has detrimental consequences but yet on the unplanned and uncoordinated land use conversion occurrence that has induced failure in controlling physical development in metropolitan Kano (Unah, 2024). Wubie *et al.*, (2016) posited that the nature and pattern of development is dynamics and unavoidable in an urban environment due to its demand of land that is complex and interdependence with growth of developing economies. However, this is expected of national development that has it influence on the people by providing employment opportunities, attraction of better lifestyle, healthcare, education and basic infrastructures. Vergburg *et al.*, (2004) identified the sustainability of mixed-function architecture as a form in space which impacts include enhancement in property value, increase in the supply of land that encouraged development towards better improvement of the entire community. While the negative externalities (Unah, 2021b, 2019) posited includes increase rate of urban growth that poses pressure on land as orchestrated with (re)-development of commercial structure in residential areas. This is associated with problems such as pollution, poor environmental sanitation, and high crime rate, weakness in securing the immediate environment, stress of the extant infrastructure, overcrowding, traffic congestion, and ill-health of the vicinity. Nkolika *et al.*, (2018) averred uncoordinated land use environment distort the original plan and pose a serious problem to planning authorities while Barau *et al.*, (2015) documented the progressive changes witnessed by urban Kano for the 19th century through its exacerbation in the 21st century, where the study mentioned the unprecedented change to landscapes of Kano and in particular green areas which include scrublands and city ponds. Unah *et al.*, (2024) opined that low income earner get cheaper gain and access to illegal land market, thereby increasing violation of building regulations, \illegal settlement and rise of sub-division of land racketeering are constraint by low-income earner challenges that led to scatter building development on informal and unplanned illegal settlement at the Kano outskirts. Therefore, they

are also responsible for major challenges of uncontrolled development in Kano (Ibrahim and Unah, 2023, Dankani and Abubakar, 2011) and have necessitated a critical assessment of city landscape and hinterland. Unah (2019) posit that change in (re)development of residential housing conversion to commercial and public buildings do not put into consideration its effect on socio-economic / environmental implication of the study area (Unah and Ibrahim, 2021) and the quality of life for the residents. This has put enormous pressure on the communities that has led to a change in improvement that required constant adjustment to the urban structure of a place that has led to paths of sustainable development.

The rates, levels, directions and the dynamic implications of mixed functions change has been a subject of academic discussion in recent times. Chen et al., (2018) expressed that in the last five decades, the enormous changes in the pattern of mixed-functions of land either from one into another has been intensified globally. This development has attracted large volumes of skilled and unskilled labor forced based on the influx of people in search of better jobs, attracting a paid better wages that encourages rural-urban migration (Unah *et al.*, 2024). Unah (2024), Zakkal *et al.*, (2022) opted that Kano will continue to develop indisputably of becoming a mega city despite the undermine power of urbanization as a factor of controlling the physical development metropolitan environment. The study purports the sustainability of mixed-functions environment as a form of urban architecture for the peri-urban settlement of Kabuga, Kano state. Kabuga and its environs recently has seen high density buildings, whose concept has been embraced by both the public and private sectors, has contributed to sustainable growth and stimulates peri-city economic developments.

The thrust of this research is discussing the importance of mixed-functions development for the diversity, vitality and sustainability of metropolitan Kano cities. Therefore, the need for extensive attention and contextualized case study to be paid to peri-urban Kabuga and its fringe areas that are gradually being occupied with mixed-functions residential and commercial buildings development has seen taking over the skyline of the place in the last two decades. This has become the driver path-way to mixed-function development appraised. The study contributes to the growing literature in urban studies due to growing problem faced by urban Kano as theorized environment with large population.

1.1 Literature Review

Although, mixed-functional use itself is not a new phenomenon as applied to Kano built environment, as the ancient city has developed into being the commercial hub, and epic – center of northern Nigeria that has seen the influx of other Nigerians and foreigners moving in Kano (Unah, 2021a). Ibrahim (2014) clearly stipulated that the Kano ancient walled area is demarcated from other settlements and excludes the non-indigenous people amongst other dwellers. The emerging of Kabuga as a sustainable community as a new development paradigm/strategy and a frontier to support urban sustainability which has adopted sustainability of new practice, and the mixed-functions of building development has been considered as an important path toward the “cosmopolitan city” and “smart growth”. The support for mixed-development functions has increased in literature by interdisciplinary researchers (Kong et al., 2015) around the world. Unlike most countries of West, European and Asian countries in which urbanization level is high and mixed use development has become a path way of addressing multiple urban problems (Garreau, 2011), this has not hit the central stage in most sub-Saharan cities. Kano region stands as one of the epicenters of rapid population growth in sub-Saharan Africa has evolved with a long history of culture composition and socio-economic growth. Kano’s built environment is characterized by a combination of formal (planned) and informal built environment (Ibrahim and Mai, 2020). The metropolitan city of Kano having made up of seven local government communities such as Duse, Dala, Gwale, Municipal, Nasarawa Fagge and Kubuga the area has survived a means of

livelihoods, prospect, prosperity and posterity (Maigari, 2014), with steady population increase of mixed function use, which majority are of communities are being multi-functional environment (Vorontsova *et al.*, 2016). The undeniable pace of urbanization and urban expansion of development remain a visible mixed-development of contemporary buildings which continues to attract physical expansion and conversion of large scale peri-Urban Settlement of Kabuga Kano as unabated. The study of mixed-function as a path to sustainable development has remain stream to powerful merchant class of extensive external links through the trans-Sahara trade which the region served as enter-pot (Tanko and Idris, 2014). This requires some studies concerning mixed-development that has regulates Kano built environment and suburban community that require analyzes for the possibility interaction for successful mixed-use development in inner-city areas, urban fringe areas and decaying areas (Xing, 2005); as paths to Sustainable communities. However, this development apparently is not of a mix of functions but the occasion to this development arises as a result of urbanization where lower structures are being displaced with higher one (Unah, 2019). In this article, the analysis of sustainable community that involves the critical factors of the enabling fact that give rise to the mixed development of different buildings functions and by extension, the impeding urban growth that has enhance the built environment. No doubt, this has its toll on the socio-economic beef up of this fringe settlement transformation of both human and non-human activities in the communities.

The continuous desires at maximizing economic returns as well as the urgent request to accommodate new physical re-development of mixed-function building by locals and planning authorities has necessitates the changes in land development pattern. Unah (2019) identified housing redevelopment to pressure on the built environment orchestrated by increase rate of urban city growth poses challenges and opportunity, redevelopment of commercial structure in residential settlement brought with it urban problems such as pollution, overcrowding, poor environmental sanitation, traffic congestion, high crime. The directions of changes were majorly from the physical use of land and will be continuous as a result of insatiable nature of man-land relationship and function in optimal development (highest and best use).

1.2 Sustainable Communities: Paths to Mixed-Function Development

Sustainability is the process of creating sustainable environment that promotes the wellbeing of the people. Unah, (2022b) opted that as living environment is being transformed, it entails advantages and disadvantages that should be accessible with amenities-services, as well as economic vitality and social equity to facilitate the fast urbanized neighborhood infrastructures development. Dankani and Abubakar, (2011) posited sustainability are a form of suitable human settlement for economic development being (urban or rural) that connotes serviceability and liveability in order to promote good basic public services and maintaining minimum level of safety and environmental standards. This approach encompasses issues such as: social equity, livability, health equity, development, social capital and support, human rights, labor right, cultural responsibility and community resilience Magee *et al.*, (2013). Dantong (2018) stated that sustainability combines physical infrastructure to support cultural life social amenities, and systems for community engagement and space for people live and work. Unah and Muktar (2020) identified that sustainability does not focus on only neighborhood and community, but also physical environment which (Unah, 2021a) further opted rapid urban growth and expansion has resulted in urban sprawl, whereby new communities extensions are developed around the major road of urban centre encroaching on other settlement which do not take account of the social value of open space upon land conversion into urban use and extension creating suburbs that are then dependent on sustainable development. Therefore, sustainable development is

geared towards meeting the needs of the current community without compromising the path-way to mixed- function of the future built environment needs. Mixed-function development often serve multitude of users in order to address the social benefits of urban development and the well-being of economic and environment viability. Kano built environment has an existing mixed-function used which sustainability can be characterized as a path way to economic growth. Sustainability (Figure 1.). Moreover, sustainable mixed functions has been considered as strategies for development and create additional job opportunity (Ibem and Aduwo, 2013) and improving the quality of the built environment (kara, 2011), integrating socio-economic activities of peri-urban communities development (Dimuna and Omatsone, 2010).

1.3 Sustainable Development

The United Nation World Commission on Environmental and Development (UNWCED, 1997) described that Sustainability is "the arrangement of technological, scientific, environment, economic and social resources in such a way that the resultant heterogeneous system can be maintained in a state of temporal and spatial equilibrium. Ajah (2016) opted that (WCED) headed by Gro Harlem Brundtland, in 1987 defined 'sustainable development' (SD) often cited by the World Commission on Environment and Development (WCED) as 'development which meets the needs of the present generation without compromising the ability of future generation to meet their own needs' (WCED, 1987) Brundtlands definition also creates knock-on subsets of sustainable development to meet various sectors needs such as sustainable housing, sustainable communities, sustainable business, sustainable construction, and sustainable agriculture and so on. Thwala and Aigbavboa (2015) agree that despite some researchers only accepting environmental aspect and neglecting the aspect of economic and social Pillars. Sustainable development has now been includes economic, social and environmental pillars, and as such the model have since been extended by adding an institutional or governances, thereby widened it horizon. The three dimensions of sustainability are needed in order to create a balance and to obtain a desired outcome of sustainable development. This includes;

Environmental Sustainability (ES) include: Capacity for adaptation, durable life safety, provision of infrastructure facilities and integration of the natural environment. ES ensure stable base for resources, excessive use and exploitation of natural environment.

Social Sustainability (SS) attaining the needs and desires of the society and local communities by improving quality of life, quality of space, provision for social self -determination and cultural diversity and promoting human health by creating a healthy safe working environment.

Economic Sustainability (ES): the capacity and ability to put local and regional resources into productive achievement for the long-term gains of the people. This ensure that there is fair distribution and efficient division of resources which can create an economic growth and maintain a healthy balance in our environment.

2.0 MATERIALS AND METHODS

2.1 Study Area

Kabuga community is located in Kumbotso Local Government Area Kano state, Nigeria. It lies between latitude 11o57'36" to 11o57'55" N and longitude 8o26'45" to 8o27'15" E and at about 508.7 metres (1526ft) above sea level. The climate is a hot, semi-arid type with an annual average rainfall of about 690mm (27.2 in); majority of which falls from June through September. Kano as a sustainable community has survived the name city in the 11th and 12th century after the construction and completion of the city wall during the reigned of Sarki Jusa whose further seen immigrant move into it peri- urban space as Paths to Mixed- function development of Kabuga and environs. The development of Kano has been documented to early days of colonial rule,

where the number of towns in Kano was quite bold and impressive. Kano is not a city-state but a nation-state where rural and urban dwellers live a symbiotic relationship for a very long period of time. Whose ancient city walled had developed into a dual city extension, the old walled and the new city (outside) wall. Urbanization has induce development by conversion and expansion of its built-up environment from traditional homestead residential to contemporary commercial and industrial (Gambo, 2014) leading to a sustainable activities by the provision of infrastructure development.

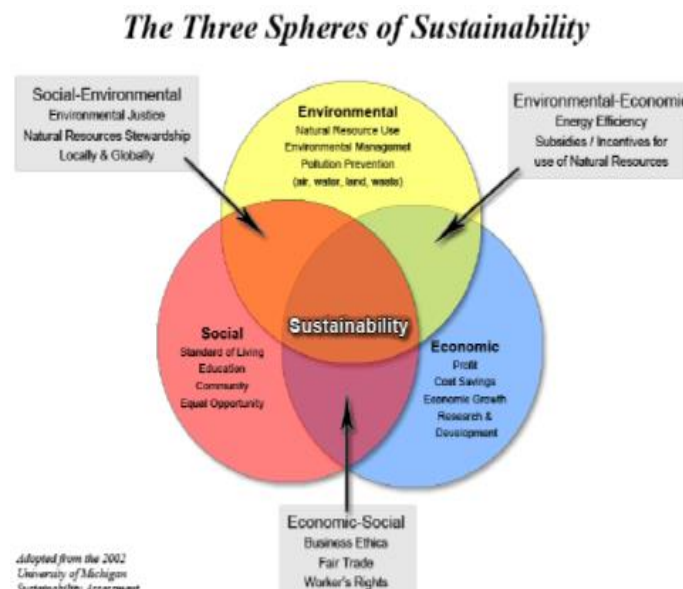


Figure 1: The three Sphere of Sustainability

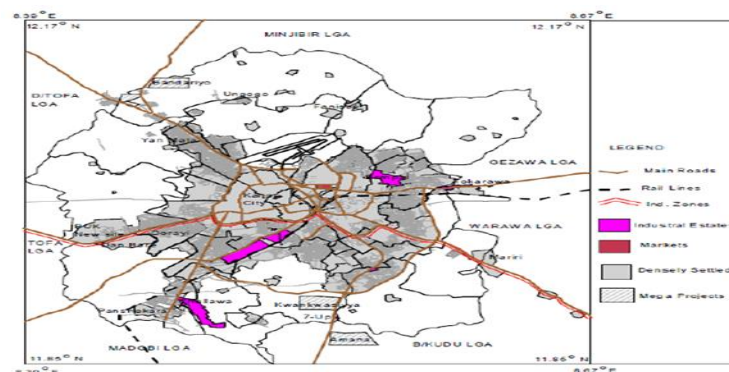


Figure 2: Present-day Kano Metropolis (Liman 2015)

2.2 Methods

The research design adopted both qualitative and quantitative methods. The qualitative data collection used was through oral interview where field work was carried out by postgraduate (MSc) students as research assistants, between November 2023 and December 2023. Quantitative data were also collected using structured questionnaire. The drivers and the consequences of the changes on built environment qualities were examined through deploying convenience sampling technique. A total of sixty seven (67) questionnaires were distributed and only 54 which account (80.6%) were retrieved from the respondents and used for the analysis which was considered sufficient for the study. The first phase of the questionnaires collected

data from respondents in order to rate their level of satisfaction with key aspects of the predominance conversion of mixed-function development types as indicated in (Table 2); section two (Table 3) direction of Predominant development conversion; implications of mixed- function change on the settlement (Table 4) and the effectiveness of mixed- function development on the Settlement (Table 5) respectively. Data were subjected using descriptive and inferential statistics which generate percentage of response on land- use options and direction of building change development associated with each of the items investigated. The second phase collected data based on non-participant observation schedule and several field survey that dwelt on the appraising the effectiveness of mixed- function development on the Settlement, using Mean Weighted Score (MWS) as an indicator and scoring system criteria derived from review of literature using content analysis. The scoring system was based on likert –type scale 1-5 to measured according to the respondent’s degree of satisfaction; based on their significance using standard deviation and relative importance index (RII). The results were presented in Tables, interpreted and in rank in level contributing to each criterion rate and modalities of built environment dynamic, the drivers and the consequences of changes on built environment qualities.

Mean Weighted Score (MWS) is expressed mathematically as follows

$$\text{Relative importance index} = \frac{\sum w}{AN} \quad (i)$$

3. RESULTS AND DISCUSSION

The analysis in Table 1 presented the predominant path to mixed-function development type in the suburban settlement of Kubuga and environs. The community has five sustainable factor of development types were examined naming: agriculture, residential, bare-land (open space), commercial and public property land use. The field survey analysis showed that (38.89%) of the respondent were of the opinion that the predominant conversion of mixed-development types was agriculture. (20.37%) agreed on residential land use (27.78%) are in support of bare-land (open space) while the least are in tune with changes attributed to commercial (7.41%) and to public property (5.55%) conversion. The identification of sustainable path of mixed-changed development were largely agricultural and bare-land (open space) type in peri-urban settlement of Kabuga Kano. This was supported by Unah (2021a, 2021b), Maiwada (2016 and 2014) and Unah and Abubakar-Kamar (2020) that most agrarian and reserved bare-open spaces are been developed and assessed rapid as a trend that has led to the conversion of mass urban lands within and peri-suburban settlement of Kano metropolis that support farming, while (Unah, 2022a, Barau. 2018, Dankani and Abubakar, 2011) for the purpose of commercial, and maintained a tremendous changes to the physical, social and economic development of the area.

Table 1: Predominance conversion of mixed-function development types

Factor	Land Use Options	Frequency	Percentage (%)
Land	Agriculture	21	38.89
	Residential	11	20.37
	Bare land(openspace)	15	27.78
	Commercial	4	7.41
	Public reserved	3	5.55
	Total	54	100

The analysis in Table 2 revealed predominantly the direction of change development that showed the conversion and redevelopment from agrarian land use mainly to super stores (44.44%) and mall /plaza / office (22.22%). Residential development were largely redeveloped and converted into commercial buildings such as stores/retail/office (55.56%) and super stores (22.22%) and partly public / institutional (14.81%) respectively. Most of the existing bare land (open spaces) are being dominated by super stores/retail shops (33.33%) and mall/plaza/office (25.93%) of contemporary structures. Unah and Abubakar-Kamar (2020) recognized public open space (bare-land) as essential green nucleus, nodes of the community that provides void for breathing space which gives form to the ebb and flows of human exchange and places routines channels for nodes of communication, and the common grounds for play and relaxation. From the analysis, four major findings were deduces as a dominant path- way to a sustainable mixed-function development of the peri- suburban settlement of Kabuga and environs. This are super stores / office, mall/plaza/office public / institutional and recreation /game /event change. The fast developing change of the study area are attributed to urban renewal.

Table 2: Direction of Predominant Development Conversion

Change Development	Direction of Building	Frequenc ies	Percentage (%)
Agricultural	Mall/Plaza/Office	12	22.22
	Residential	3	5.54
	Super Stores	24	44.44
	Public / Institutional	2	3.70
	Industrial/ Warehouse	5	9.3
	Recreation /Game/Event	8	14.80
Total		54	100
Residential	Super Stores	12	22.22
	Public / Institutional	8	14.81
	Stores/Retail/Office	30	55.56
	Industrial/ Warehouse	-	-
	Recreation /Game /Event	4	7.41
	Agriculture	-	-
Total		54	100
Bare Land	Super Stores/Retail	18	33.33
	Mall/Plaza/Office	14	25.93
	Residential	9	16.67
	Public / Institutional	6	11.11
	Recreation/Game/Event		
	Industrial/ Warehouse		
Total		54	100
Public Land	Super Stores/Retail	7	12.96
	Mall/Plaza/Office	15	27.78
	Residential	21	38.89
	Public / Institutional	8	14.81
	Recreation/Game/Event	-	35.56
	Industrial/ Warehouse	-	
Total		54	100

The continual acquisition of open bare and agrarian land for the immediate physical development were due to building encroachment, commercial activities and the large population of human (Maigari 2018, and Nkolita *et al.*, 2018). Secondly by increasing spontaneous haphazard development of self-help assist residential building on multi- subdivision of green –bare land by land racketeer thereby violating and contravening of building regulations (Ibrahim and Mai, 2018; Unah and Ibrahim, 2021; Ibrahim and Unah, 2023). Lastly by increasing and improving demand by the timid population of working sectors to meet the needs for hyper store/ retail offices and business. Hence mixed used change in development will continue to succeed in conversion as long as demand for land by developers/ individual continue.

Table 3 examined the implications of mixed- function change on the settlement. The study uses descriptive and inferential statistical techniques. The Mean Weighted Value (MWV) were analysis and ranked accordingly to the level of perception the respondents attached to the variables affecting the built environment. The analyses eleven (11) mixed- function change consequences in the study area and the result showed that, Economic / marketability landscape distortion, increase in building value, pressure on urban infrastructure, traffic congestion were ranked 1st, 2nd, and 3rd were ranked 1st, 2nd and 3rd with MWS of 4.20, 3.91 and 3.83 respectively. The 4th, 5th, 6th and 7th ranked implications were traffic congestion, encroaching to suburban settlement and nature of housing construction. Other consequences ranked in descending order of their MWS and ranking were: violating planning regulation (MW=3.61), tenure insecurity (MW=3.52) and urban sprawl (MW=3.39) and overpopulation were ranked 8th, 9th, 10th and 11th respectively. Landscape distortion in Kano generally is noticeable in the suburban peri-urban fringe settlement. Unah *et al.*, (2024a) posited cheaper gain and access to illegal land market, increasing violation of building regulations, building on informal unplanned \illegal settlement and rise of sub-division of land racketeering are constraint by low-income earner challenges that led to scatter illegal settlement Unah *et al.*, (2024b) at the Kano outskirt. The continuous growth of uncoordinated conversion of (open spaces) by low class Kano residents and small business tends to results into other environmental problems such as decertification, urban sprawl and land degradation. Other noted consequences such as pressure on urban infrastructure, and traffic congestion Unah (2024) are linked to overpopulation while encroach to suburban settlement and can be attributed to uneven pattern of land use change among other.

Table 3: Implications of mixed- function change on the Settlement

Variables	N	SW	Mean	SD	R.I.I	Rank
Economic / marketability	54	277	4.20	0.077	0.84	1 st
Landscape distortion	54	211	3.91	0.072	0.78	2 nd
Increase in building value	54	207	3.83	0.071	0.77	3 rd
Pressure on urban infrastructure	54	206	3.81	0.071	0.76	4 th
Traffic congestion	54	204	3.78	0.070	0.76	5 th
Encroach to suburban settlement	54	203	3.76	0.069	0.75	6 th
Nature of housing construction	54	199	3.68	0.068	0.74	7 th
Violating planning regulation	54	195	3.61	0.067	0.72	8 th
Tenure Insecurity	54	190	3.52	0.065	0.70	9 th
Urban Sprawl	54	183	3.39	0.063	0.68	10 th
Overpopulation	54	178	3.29	0.069	0.66	11 th

Base on the Table 4: ranking with the use of relative important index (RII) it's deduce among the ten (10) items of the mean item weight (MIS) for the listed effectiveness of mixed- function development was assessed. The survey findings revealed the most rated effectiveness of the mixed-function on the built environment contribute to *urban revitalization of Kabuga*

(MIS=4.11; RII=0.82); clean environment (MIS=3.89; RII=0.78) and as well enhance the physical appearance of the neighborhood (MIS=3.83; RII=0.77); also enhance economic inclusion promote (MIS=3.74; RII=0.75) and as well offers range of public services (MIS=3.65; RII=0.76) and economic opportunity (MIS=3.56; RII=0.71) that is making Kano cosmopolitan city. Other aspects which were not highly rated include safe community (MIS=3.54; RII=0.70); diverse social mix (MIS=3.48; RII=0.68); enhance quality of life (MIS=3.42; RII=0.70); and Poverty alleviation (MIS=3.32; RII=0.66) respectively. The current findings concurs with works of previous scholars such as Unah (2022a, 2022b, 2021a); Unah and Ibrahim (2019), posit Kano to be terminus distribution centre for foreign and international trade route commodities of sub-Saharan Africa. Moreover, the literature on mixed income housing Thwala and Aigbavboa (2015) points out that the rationale for mixing individuals from different income groups in on residential development is that it has specific social spinoffs such Poverty alleviation and enhance quality of life. These findings reveals that the path to mixed-function development is key to peri-urban sustainable community's enhancement and its associated renewal and destructive effect to the built environment Unah *et al.*, (2024b). The developmental growth and planning of Kano by successive administration, from colonial era has been remarkable in the economic development amid the rapid urbanization and challenging environmental sustainability (Unah, 2024, Dankani and Abubakar, 2011).

Table 4: Effectiveness of mixed- function development on the Settlement

Effect	Mean	R.I.I	Rank
Urban revitalization	4.11	0.82	1 st
Clean environment	3.89	0.78	2 nd
Enhance physical appearance of neighborhood	3.83	0.77	3 rd
Enhance economic inclusion	3.74	0.75	4 th
Offers range of public services	3.65	0.76	5 th
Proximity to economic opportunity	3.56	0.71	6 th
Safe community	3.54	0.70	7 th
Promote diverse social mix	3.48	0.68	8 th
Enhance quality of lie	3.42	0.70	9 TH
Poverty alleviation	3.32	0.66	10 th

Furthermore, Unah (2024, 2022b) emphasized that a significant benefit of a mixed-function development to peri-urban sustainable communities ensures that all human activities will have some degree of standardization and will occur harmoniously relying on collaborative planning processes to achieve even more sustainable forms of urbanization with the built environment.

4. CONCLUSION

Kabuga urban fringe communities has been urbanized sporadically into large scale building development that has been functional path of mixed-functions use of residential development to commercials. The peri-urban settlement of Kabuga and environs has a phenomenal increase of humans in relation to supply of basic life supporting resources, economic development and environmental quality. The disappearance urban agricultural landscapes support livelihoods of some of the urban poor. As a paths to mix-functional development, the area is characterized by two main adjustable mechanism, agriculture - intensification and economic diversification. Open bare-land are recognized public space that are essential counterpart to the more settled community that provides places and routines of everyday life, provides channels for movement, the nodes of communication, and the common grounds for play and relaxation. This makes the community more sustainable in contention among other fringe settlement of Kano. The quality

open spaces that is lacking in most residential area of Kano metropolis, were due to building encroachment, commercial activities and the large population of human. Kano state has undergone massive transformations in the past decades and has been characterized by urbanization of sustainable growth of rapid mixed-function buildings of socio-economic activities. This path-way to mixed- development fulfill multi-functions in the provision of high rise buildings of plazas, malls, shopping complexes, departmental stores, furniture sales outlet, pharmaceutical stores, and variety of restaurant that provides high-end mixed functional use of spaces for global goods and food for both local and continental services. As well as entertainment center and venues for games arcades and spot are integrated development of the built environment that encompasses leisure with locals' culture of the people, employing several vibrant young college boys and girls with formal and informal education.

On the global frontier of socio-economic development, mixed-function activities has stimulated the fast growing population of Kabuga and this have impacted both positively and negatively on the built environment. However, sustainable development of Kabuga has been induced by urbanization which has continued to improve the suburban community's quality of Kano and its environs by renewing the city. This growth if properly controlled and managed could lead to economic enhancement, reduced poverty and improved the quality space. Mixed- function of buildings and other related human activities which encourages dense peasant communities in the peri-urban areas settlement has gradually turning into a cosmopolitan one. This factors opted were advanced which will continue to exert influence on the structure of Kano's fledgling mix function of the built environment.

The studies and practice call for concerned since Kano metropolis is being mixed- up in present form and this requires to be generalized, revolutionized, mechanized with policies of functional-mixed communities. Most residential buildings and bare-open spaces has also paved way for mixed-function/change development. This has characterized the skyline of the peri- suburban settlement being affected by the wave of sustainable development path as needed to enhance the development of high rise contemporary buildings specially located at prime core area or redevelopment of old existing. The constant urbanization of Kabuga to a more Sustainable communities has been a path-way of development, which has generate high concentration of economic income and investment of contemporary buildings in the contest of its built environment. Kabuga built environment has witness rapid development of mixed -function activities that has stimulated the socio-economic development of its environs. Mixed- function of buildings and other related human activities in the metropolitan city is encourage by infrastructural development that is gradually turning the city into cosmopolitan one.

4.1 Recommendation.

The case of Kabuga in western part of Kano metropolis has undergone mixed functional use of (re) development and has been identified as a path toward sustainable vibrant community development. In line with the steady progress made by the Kano State government in the adoption of mixed-function sustainable development in it large metropolis and environs, the implementation of sustainable communities should be further facilitated in a number of ways. The built up area of Kabuga has emerge in recent decade a settlement of sustainable development into suburban environs. Making Kabuga a smart growth and compact peri-urban city. The following are therefore recommended in order for mixed-function development to be better adapted to support the path to sustainability development and the improvement of the human/built environment.

- i. Also, sustainability regeneration plans must emphasize each of the social, economic and environmental pillars that are essential to sustainable integration of path- way to

functional environment approaches seem to focus on improving and extending the physical rather than the natural or social environments.

- ii. Improving the physical and social environment requires the provision of sustainable pathway to economic facilities supplying a range of social supports to the community through education and training, childcare, assistance with childcare costs to build a socially inclusive and sustainable community is required for the people integration and aspiration.
- iii. The results of this study can contribute immensely in assisting the state developmental policy in guiding project execution through environmental impact assessment between stakeholders and governments. As this will assist stakeholders better understanding the effectiveness of mixed-function in the development of Architectural contemporary edifices whose demand mainly for open spaces or conversion of less building to high rise structures, beautifying the city-scape. The study adds to the knowledge on sustainability built environment in Kano through paths to mixed –function development in Kabuga and environs.

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