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THEME

## Planning Human Settlements in Nigeria for Resilience and Sustainability

Conference Papers



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## Planning Human Settlements In Nigeria For Resilience And Sustainability—An Overview

Being Text of the Lead Paper Presented at the National Conference of the Nigerian Institute of Town Planners (NITP) 2021

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**From**

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### Protocols

#### 1. BACKGROUND

1.1 Human Settlements may be defined as clusters of dwellings of any type or size where human beings live, work and play, and may include hamlets, villages, towns, and cities, etc. in their sizes and hierarchies. The sparsely populated and mostly agricultural settlements are classified as **rural**, while densely populated and non-agricultural settlements are classified as **urban**. A settlement may have known historical properties such as date or era in which it was first settled, or first settled by a particular people, etc. The conventional factors influencing settlements include availability of water (for transportation routes and for drinking, etc); flat land (for ease of building); fertile soil (for crops); and forests (for timber and housing, etc.). Earlier human settlements were, almost always, near water given its relevance to consumption, electricity, irrigation, manufacturing, transportation, health, recreation, and culture, and the like [1]. The key human settlements of that era served either religious, cultural, military, or political functions, etc., as the case may be. Modern settlements have several elements—housing, building, planning and the relationship of these—and such other activities as environmental change, and national and international development, etc., and primarily serve economic functions. Planned settlements, not instinctively chosen by residents, are established by government and provided

shelter, water, and other infrastructural facilities, and usually established on acquired lands. In general, suitable human settlements confer access to accommodation for residents that is adequate, suitable, relevant, appropriately located, affordable, and fiscally sustainable, as well as access to basic services such as water, sanitation, refuse removal, and electricity, etc.; security of tenure irrespective of ownership or rental, formal or informal structures; access to social services and economic opportunities within reasonable distance, etc.

1.2 Habitat II—The Second United Nations Conference on Human Settlements defined human settlements as “the spatial dimension as well as the physical expression of economic and social activity”; “an objective of development”; places where people can live, learn, and work in conditions of safety, comfort and efficiency; and an indicator, and the most visible expression of society’s ability to satisfy some of the fundamental needs of its members; and a prerequisite for social and economic development as no social progress for sustainable economic growth can occur without efficient settlement systems and settlement networks.[2].

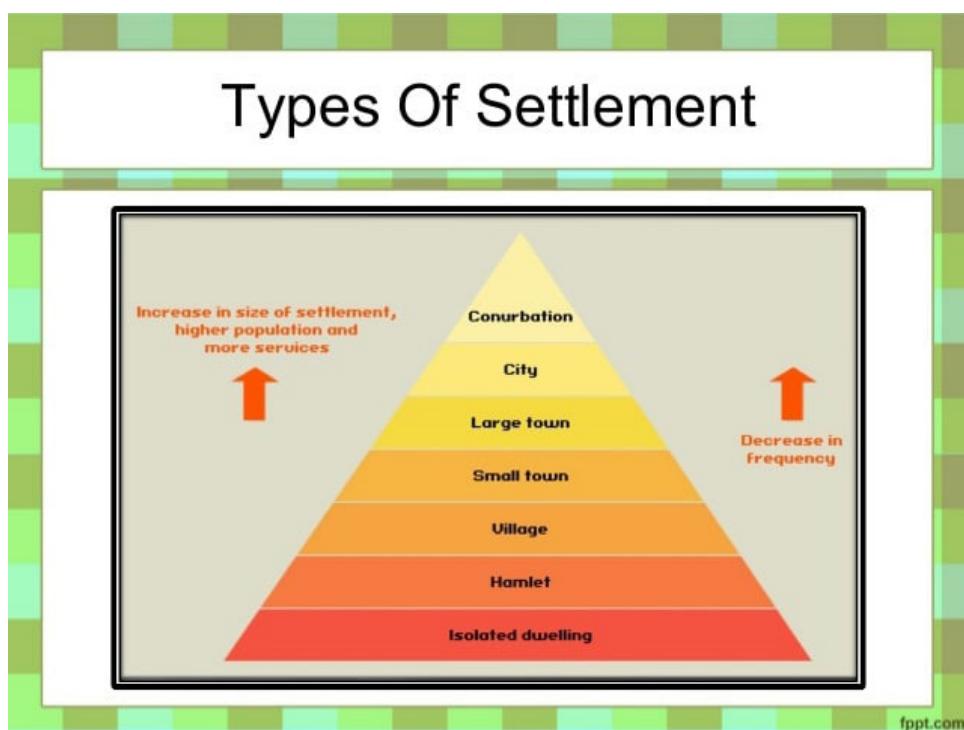


Figure 1—Settlement Hierarchy Pyramid

Source: [www.thegeographeronline.net](http://www.thegeographeronline.net)

1.3 At the apex of the human settlements hierarchy are conurbations, a continuous aggregation of built-up communities created as a result of urban sprawl. Cities are generally the products of urbanization, and have extreme social and economic importance, even though for most of

human history, world population was predominantly rural and in small urban settlements. The growth in global urban population, evidently, occurred slowly. For example, only 3% of the world's population of about one billion lived in urban areas in 1800; and Beijing was the only human settlement with a population in excess of one million then (Davis, 1955; Chandler, 1987; Satterwaite, 2007). Over the next 100 years, global share of urban population increased to 13% in 1900 and to about 29% in 1950. Since 2000 global urban population has outnumbered the rural population, and has led to the growth of cities of all sizes.

Table1. World Africa and Nigeria Urban Population as a Percent of Total Population1950–2025

Year	World	Africa	Nigeria
1950	29.2	14.5	10.1
1955	31.2	16.3	12.1
1960	34.2	18.3	14.4
1965	35.5	20.6	17.0
1970	36.6	22.9	20.0
1975	37.8	25.2	23.4
1980	39.5	27.8	27.1
1985	42.2	30.6	31.0
1990	45.2	33.9	35.2
1995	48.1	37.3	39.3
2000	51.1	40.7	43.3
2005	53.9	44.0	47.2
2010	59.3	50.7	54.8
2020	62.0	53.9	58.3
2025	64.6	57.1	61.6

Source—World Economic Forum

It is estimated that by 2050 about two-thirds of the world's population will be in urban areas, much of it in Asia and Africa which are still predominantly rural. Urban growth will also largely occur in less developed Africa, Asia, and Latin America. Current urbanization levels are 73% in Europe; 89% in North America; 45% in Asia; and 40% in Africa (World Bank, 2015).

1.4 On the **positive** side, the economic attraction of cities accelerates urbanization, and cities act as the world's engines of business and innovation, and centers where population and assets

are concentrated, and hubs for ideas, commerce, culture, science, productivity, social, human and economic development, etc. Cities function as beacons of opportunity, etc., and hold the transformative power of positive change and inclusion. In addition, cities account for about 70% of global Gross Domestic Product (GDP), generating economic growth and prosperity for many. Cities are also a critical factor in global development efforts due to the cross-cutting nature of urban issues, etc. The three pillars of sustainable development (economic development, social development, and environmental protection) are, for example, fundamentally linked to urbanization [3]. With good management, cities provide jobs, hope and growth. With 60% of their area still to be built by 2030, cities represent unparalleled opportunity to forge a new urban era where people can find freedom, inspiration, prosperity, health and security. Cities represent a unique chance to make the right infrastructure and planning choices to overcome many mistakes of the past and to create livable communities that are truly regenerative (sustainable) and resilient.

1.5 On the **negative** side, cities face persistent problems associated with air and water pollution, energy distribution, water supply, and waste disposal, and waste generation, etc. Most cities, particularly in the developing world and emerging economies, struggle with inadequate infrastructure to accommodate the surge in urban dwellers, as well as heightening some of today's most pressing global problems. Challenges such as poverty, environmental degradation, poor air and water quality, insufficient water availability, waste disposal problems, and high energy consumption, etc., are increasingly located and amplified in cities particularly in the developing world. In addition, the built environment in general and cities in particular profoundly impact the natural environment, health, well-being, as well as economic productivity, etc. The complexity of the challenges of human settlements of the twenty-first century is evident from the following.

- Cities have stark inequalities in the distribution of incomes, public services, access to open spaces, and quality of life, etc. In middle-high income countries, urban sprawl and car-centric and inefficient transit systems create traffic congestion, pollution, and safety hazards, degrading quality of life, lack of green spaces, etc., all of which contribute to social and environmental stress, especially in poor urban neighborhoods.
- Urban communities are fractured by poverty and unequal access to community services, which is accelerated by gentrification.
- In low and middle income countries, large populations live in overcrowded slums that are expanding rapidly.
- Many cities are unable to provide adequate sanitation, or food and water scarcity for the slum dwellers whose residents face a high risk of malnutrition and disease.

- The functioning and stability of many world cities are threatened by extreme climatic events such as floods, heat waves, and draughts which are expected to worsen in the coming decades, putting more lives and infrastructure at risk.
- The unprecedented speed and scale of urbanization globally has significant consequences for Greenhouse Gas (GHG) emissions. Even though urban areas cover less than 3% of the earth's surface, they are responsible for an estimated 70% of GHG emissions (World Bank, 2015).
- GHG emissions in cities are released mainly from activities such as construction of buildings and infrastructure; transport; consumption, and production–driving energy demand (Mayr, et al., 2017).
- It is estimated that buildings account for more than 40% of global energy use and approximately 30% of energy-related GHG emissions. In the near future, as current trends in population growth continue, a significant need for new buildings will be stimulated, thereby worsening global energy use, and energy-related GHG emissions (Lucon, et al., 2014).
- Transport accounts for about 23% of total energy-related CO<sub>2</sub> emissions, with urban transport directly responsible for 40%—mostly in higher income countries (UNEP, 2017), while the transport systems in lower income countries account for 90% of the growth in total energy-related CO<sub>2</sub> emissions (Mayr, et al., 2017).
- The massive build up of urban infrastructure is a key driver of emissions across multiple sectors, while density, land-use mix, connectivity, and accessibility, etc. are key urban form drivers of energy and GHG emissions.
- Urban GHG emissions are influenced by such factors as income, population dynamics, urban form, locational factors, economic structure, and market failures, etc. In addition, urbanization today is, unlike in the past, taking place at lower levels of economic development; the majority of future urban population growth is expected to occur in small to medium-sized urban areas in developing countries.
- Cities are vulnerable to climate-related disasters due to many factors such as cultural, economic, and demographic characteristics of residents; local governmental institutional capacity; the provision of ecosystem services; and the built environment and human-induced stresses, etc. (Rosenzweig, et al., 2015). `
- A large number of developing countries where rapid urbanization is taking place often

have no national urbanization plans to manage urban expansion.

- Sprawling, disconnected urban development exacerbates the need to extend infrastructure, basic services, and public transport into peripheral areas (Godfrey and Zhao, 2016).

## 2. HUMAN SETTLEMENTS IN NIGERIA

2.1 According to the World Population Review, Nigeria is currently about 58.3% urban and 41.7% rural. The country's population is said to have doubled within a period of 20–25 years, and its major towns (Lagos, Kano, Ibadan, Enugu, Port Harcourt, Maiduguri, Kaduna, Jos and Ilorin, etc.) increased five folds over three decades [6]. The densely populated settlements occur along the coast in the southwest, far north, and central area, while rural settlements of dispersed homesteads are usually inhabited by people of common ancestry.

2.2 Before the twentieth century, the Yoruba southwest was the most urbanized in the whole of tropical Africa. Yoruba towns such as Ibadan, Ogbomosho, Abeokuta, Ile-Ife, and Oyo are several hundred years old. In the south, places like Calabar grew from coastal fishing and salt trading villages into towns, while some northern towns like Kano, Zaria, and Katsina owe their existence to trans-saharan trade and are much older than even the Yoruba towns. The creation of states in 1967 diverted population and some industries and businesses from Lagos to the new state capitals. Some, hitherto, smaller towns like Makurdi, Minna, Uyo, Maiduguri and Bauchi, etc. experienced remarkable growth in population and economy since becoming state capitals. Abuja, a planned city and the national capital since 1991, as at 2020 had a population of about 3.3 million—a 5.9% increase from the 2019 metro area population of about 3.1 million residents.

Table 2–Nigeria Rural/Urban Populations 1950–2025

Year	Rural Population	Urban Population	Urban Population as % of Total
1950	29,595,000	3,340,000	10.1
1955	32,605,000	4,489,000	12.1
1960	36,220,000	6,058,000	14.3
1965	40,396,000	8,280,000	17.0
1970	45,252,000	11,319,000	20.0
1975	50,835,000	15,511,000	23.4
1980	57,188,000	21,242,000	27.1
1985	63,448,000	28,568,000	30.9
1990	70,383,000	38,159,000	35.2
1995	77,533,000	50,162,000	39.3
2000	84,853,000	64,768,000	43.3
2005	91,960,000	82,347,000	47.2
2010	98,435,000	102,831,000	51.1
2015	103,411,000	125,343,000	54.8
2020	106,458,000	148,935,000	58.3
2025	107,758,000	173,135,000	61.6

Source; UN DESA

2.3 Lagos, the nation's economic nerve centre, has a population in excess of nine million residents, while seven (7) other cities (Abuja, Kano, Ibadan, Kaduna, Port Harcourt, Benin City, and Maiduguri) have populations in excess of one million people. Eighty (80) cities have populations of between 100,000 and one million people, while 248 cities have between 10,000 and 100,000 people (2021 World Population Review). It is projected that by 2050 the country's population will be about 295 million people, two-thirds (200 million) of which will live in urban areas. The new population will require the equivalent of about 20 middle-tier cities, while Lagos, the biggest city, will grow even bigger to rival Beijing, Mexico City and Sao Paolo in population size.

Table 3—Nigeria Urban Demographics 1921–2020

Year	Total Population (000's)	Total Urban Population (000's)	Percentage of Total Population	No. of Cities with Population 100,000	No. of Cities with Population 200,000 and above	No. of Cities with Population 500,000
1921	18,720	890	4.8	-	10	-
1931	20,056	1,343	6.7	2	24	-
1952/54	30,402	3,701	10.2	7	54	-
1963	55,670	10,702	19.2	24	185	2
1972	78,924	19,832	25.1	38	302	3
1984	96,684	31,902	33.0	62	356	14
2020	160,000		68.0	132	680	36

Source; UN DESA

## 2.4 Planning Human Settlements

2.4.1 The ways people live, work, play, and move around cities and communities have changed substantially over time. Human settlements have, for centuries, engaged the attention of professionals, researchers and policy makers, etc. The quest for efficiency and livability and, more recently, to enhance inclusiveness and productivity of cities, and due to their economic and social importance, cities have been much researched, re-invented, and so on, including some utopian ideals. As early as about 407 BC, Hippodamus of Miletus dubbed “the father of city planning” designed Miletus based on the Hippodamian or grid plan; subsequent Greek and Roman cities also adopted this approach. Rome’s many cities imposed a grid pattern and also developed sanitation, public housing, public buildings, and the forum, etc. [4]. The new city of Alexandria, in the 4<sup>th</sup> century BC, laid out by Dinocrates of Rhodes is the grandest example of idealized urban planning of the ancient Mediterranean world.

2.4.2 China, in the second millennium BC, used geometry to locate and plan cities, with their walls orienting to cardinal points, while the symbolic cities were constructed as celestial microcosms, their central point of which corresponded to the pole star, representing harmony and connection between the earthly and realms. The imperial city and the people’s city both were divided into two halves—western and eastern. During the European middle ages, a town was a much a political entity as a collection of houses. City residents bought freedom from customary rural obligations to lord and community. By the thirteenth and fourteenth centuries, some cities became powerful states, incorporating the surrounding areas into extensive maritime

empires. By early nineteenth century, London, with a population of over one million, was the largest city in the world, while Paris rivaled Baghdad, Beijing, Istanbul, and Kyoto as regional traditional capital cities.

**2.4.3** In the course of the nineteenth century, modern industry created new opportunities, and triggered massive urbanization, and an influx of migrants from rural communities into urban areas. Industrialized cities were characterized by over-crowding, occupational hazards of industry, contaminated water and air, poor sanitation, and communicable diseases, etc. Factories and slums emerged as regular features of the urban landscape. The growth of cities continued throughout the twentieth century and increased dramatically in the third world, including India, China and Africa, due to industrialization and urbanization and other factors. Urban planning became widespread and professionalized. The “garden city”, the icon of a self contained, comprehensively designed, residential and commercial settlement, was the response to the largely public health issues of the industrial city, while increased car ownership paralleled with suburban sprawl, highways, and other developments for the car, and awareness of ecology, in the mid twentieth century, created the environmental movement targeting sustainable development. In addition, deindustrialization, or economic restructuring, has created poverty, homelessness, and urban decay in once prosperous cities, some of which contracted contrary to global trends of massive urban expansion.

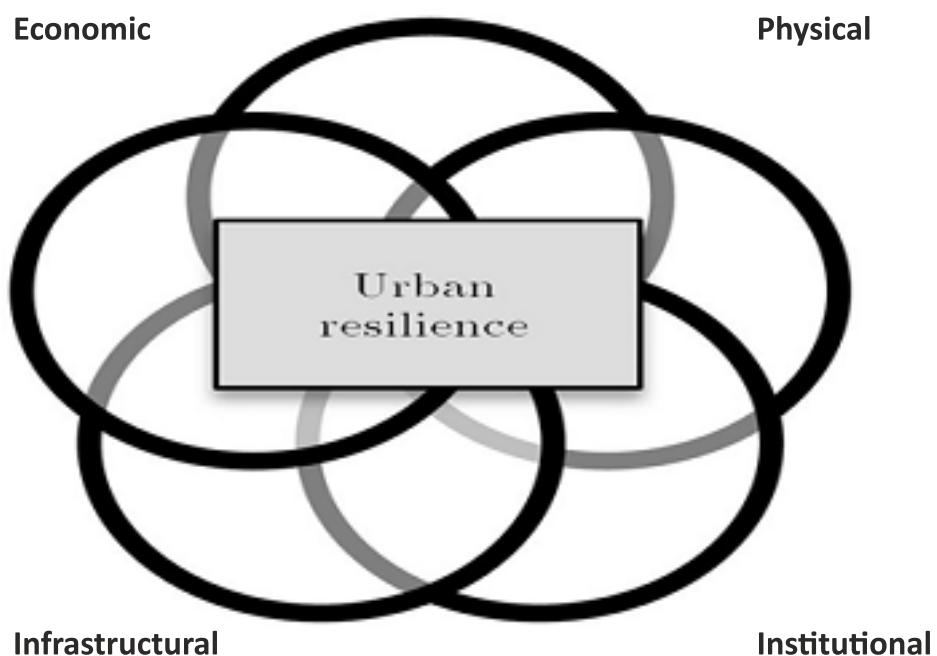
**2.4.4** The arrival of digital technology and its instantaneous communication have, in the twenty-first century, triggered a new wave of ideals about human settlements in general, and cities in particular. There are concerns about cities becoming obsolete or reinforcing the role of big cities as centers of the knowledge economy. These developments have heightened pressure on the need to rethink how we look at urbanization and how we plan, build and manage human settlements, especially urban areas, in order to achieve resilience and sustainability, as well as harmonious development, etc.

### **3. Resilience & Sustainability-A New Planning Paradigm**

**3.1** The concepts ‘resilience and sustainability’ have become part of the lexicon of urban planning, and increasingly considered a paradigm shift; a valuable addition to the urban planner’s tool kit. The theme of this year’s annual conference of the Nigerian Institute of Town Planners attests to the fact that ‘resilience and sustainability’ of human settlements are important in contemporary urban planning discourse/practice. According to Leke Oduwaye and Mohammed Abdul-Rahman, the concepts have evolved and have been adapted in a variety of contexts and across disciplines, and that at the urban scale, the relevance of the concepts in international development and urban studies gradually extended to governmental discourse, etc., and provided a new framework that is holistic and cognizant of multi-sector understanding of urban challenges, a plurality of stakeholders, hazards and scales, as well as the interconnectedness and interdependencies within and beyond urban human settlements. Wider

application of the framework particularly in international development and cooperation, governance, policy and practice circles, further refined its quantitative tools, indicators and international standards for measuring city resilience and sustainability, etc. And with the array of global actors within the urban resilience and sustainability field, the existing gap on standardization, and the like, is filling sooner than later.

Figure 2–Components Of Urban Resilience



Source; OECD

3.1.2 According to Twigg, (2007), a resilient city has capacity to withstand, or absorb, the impact of a hazard through resistance or adaptation, which enables basic functions and structures to be maintained even during crisis and the city to bounce back or recover from an event. Additionally, a resilient city is said to be able to survive a traumatic blow to its physical infrastructure, its economy, or its social fabric; the city bends but does not break; and absorbs impacts without shattering, even if the bridges and roads are ruined and the buildings toppled. Significantly, a resilient city is said to have the capacity to prevent, mitigate, absorb, respond to, and recover from the impacts of disasters. Building a city's resilience to disaster risks is essentially about enhancing its ability to minimize the effects of future disasters on communities, the economy and the environment.

3.1.2 Godschalk (2003), points out that a resilient city is capable of withstanding severe shocks and stresses without chaos or permanent deformation or rupture; and that city resiliency is built around past experiences with disasters. Significantly, a resilient city is designed to anticipate

weather, and recover and bounce back from the impacts of shocks and stresses, as a sustainable network of physical systems and communities. The physical systems (i.e. the roads, buildings, physical infrastructure, communication facilities, soils, topography, physical features, geology, waterways, and population density, etc.), are designed to survive and function in extreme shock and stressed conditions, cognizant that substantial damage to the physical systems escalates losses and significantly slows recovery.

### 3.1.3 Pillars and Main Drivers of City Resilience

3.1.3.1 Paulo Jorge et al. (2019) list the four pillars of city resilience as **resisting, recovering, adapting, and transforming**, and its (five) dimensions as **natural, economic, social, physical and institutional**. While a resilient city's physical systems are said to minimize its vulnerability to disaster, its core institutions and lifeline infrastructure are said to maintain or hold the city's social fabric and ultimately its economy. A city's degree of resilience is said to change over time due to external factors such as technology and awareness, and that particular disturbances or hazard can have different outcomes depending on the prevailing socio-economic conditions. A resilient city continues to age and its response to population movements and development changes. But, by far the more daunting challenges to present and future resiliency of cities are likely to spring from the impacts of disaster and climate change.

3.1.3.2 According to the OECD, resilient cities are cities that have the ability to absorb, recover and prepare for future shocks (economic, environmental, social, and institutional), as well as promote sustainable development, well-being and inclusive growth. The organization lists four factors (economy, governance, society, and environment) that drive a city's resilience—an **economy** that is diverse, industrial, dynamic, growth-generating, innovative, and offers access to employment, education, services, skills and training, etc.; **Governance** with clear leadership and management, strategic and integrated approaches, skilled public sector, open and transparent; **society** that is inclusive and cohesive, active community based citizen networking, safe neighborhoods, and healthy living; and an **environment** with sound and diverse eco-system, adequate and suitable infrastructure to meet basic needs, availability and adequacy of natural resources and a coherent land-use policy.

FIGURE 3–MEASURING CITY RESILIENCE



Source; OECD

#### 3.1.4 Basic Characteristics of Resilient Cities

3.1.4.1 Successful city resilience planning, a resilient city is constructed to be strong and flexible, and not brittle and fragile. Its lifeline systems (roads, utilities, infrastructure and other support facilities) are designed to continue functioning in the face of such disturbances as rising water, high winds, earth tremors, and other shocks and extreme conditions, while new and important developments are guided away from high hazard and risk areas and vulnerable existing development and population relocated to safe areas .

3.1.4.2 A resilient city's buildings are constructed or retrofitted to meet code standards based on hazard threats in order to reduce vulnerability, and its natural environmental protective systems are conserved to maintain valuable hazard mitigation functions. The stakeholders (governmental, nongovernmental, and private sector organizations and the like) have guaranteed

access to accurate information about hazard vulnerability and disaster resources, and are linked and coordinated with effective communication networks, and are experienced in collaborating and working together.

### **3.1.5 Attributes of City Resilience**

3.1.5.1 Successful city resilience outcomes are minimum disaster areas because houses, neighborhoods, and organized services and infrastructure, and the like, comply with code standards based on hazard threats, and informal settlements are prohibited on flood plains or steep slopes.

3.1.5.2 Local Governance of a resilient city is inclusive, competent, and accountable, and commits adequate resources to developing the requisite capacity to manage and organize itself before, during and after a hazard event.

3.1.5.3 A resilient city's local authorities and residents understand their risks and develop shared, local information on disaster losses, hazards, and risks, including who is vulnerable, and its residents are empowered to participate, decide and plan their city together with local authorities, and value local indigenous knowledge, capacities and resources.

3.1.5.5 City planning authorities and relevant stakeholders of a resilient city anticipate and mitigate the impacts of disasters, and monitor and evaluate, and deploy early warning technologies to protect infrastructure, community assets, and individuals, homes, possessions, cultural heritage, environmental and economic capital, and minimize physical and social losses arising from extreme human-induced and natural hazards.

3.1.5.6 A resilient city has in place, mechanisms for rapid response, prompt implementation of recovery strategies, as well as restoring basic services, social, institutional and economic activity, etc., post-disaster, and its city planning authorities and relevant stakeholders, including residents, are fully committed to building resilience to adverse environmental changes, including climate change, and reducing greenhouse gas emissions, etc.

### **3.1.6 Essentials for making Cities Resilient**

3.1.6.1 The United Nations Disaster Risk Reduction (UNDRR) initiative prescribes the following essentials for making cities resilient.

#### **A. Enabling Essentials**

- i. Organize for disaster resilience.

- ii. Identify, understand, and use current and future risk scenarios.
- iii. Strengthen financial capacity for resilience.

## B. Operational Essentials

- iv. Pursue resilient urban development and design.
- v. Safeguard natural buffer to enhance the protective functions offered by natural ecosystems.
- vi. Strengthen institutional capacity for resilience.
- vii. Understand and strengthen social capacity for resilience.
- viii. Increase infrastructure resilience.

## c. Building Back Better Essentials

- ix. Ensure effective disaster response
- x. Expedite recovery and build better.

3.1.6.2 Some 200 cities around the world recently self-assessed using the Disaster Resilience Scorecard for Cities based on the aforementioned parameters. The global snapshot revealed that the best performance was in **urban development and design**, while the worst performance was **finance capacity for resilience**. The scores help to determine problem areas and how to find solutions.

## 3.1.7 Critical Success Factors

3.1.7.1 Successful resilience planning is contingent on the following factors.

- i. Integrated approach—broad-based, and multi-disciplinary.
- ii. Partnership and coordination
- iii. Long term perspective and adaptive management.
- iv. Leadership.
- v. Public Engagement.
- vi. Enabling environment (National, legal, and policy framework)
- vii. Inclusion
- viii. Sensitization, enlightenment, and engagement.
- ix. Monitoring and Evaluation, and Review.
- x. Economic, finance, and funding.
- xi. Risk data and assessment.

3.2 **Sustainability** is a process of living within the limits of available physical, natural and social resources in ways that allow the living systems in which humans are embedded to thrive in perpetuity. The concept has a variety of meanings and is applicable to several

contexts. In the present context, sustainability is about meeting current needs using natural, economic, and social resources in a way that does not compromise the ability of the future generations to meet tomorrow's needs. By the end of the twentieth-century, concerns about social justice, conservationism, internationalism, etc., had crystallized into the call for "sustainable development", or meeting the needs of the present without compromising the ability of future generations to meet their own needs; a unification of environmentalism, and social and economic concerns on the world's development agenda.

3.2.1 Within the context of the world development agenda, sustainability has three pillars—environment, economy, and society. Environmental sustainability is about maintaining ecological integrity; keeping the earth's environmental systems in balance; and the consumption of the earth's resources at a replenishable rate. Economic sustainability is about the interdependence of human communities across the globe, and access to resources (financial, economic and natural, etc.) to meet needs i.e. securing livelihoods, while social sustainability is attainment of universal human rights and basic necessities for healthy and secure families and communities, just leadership, ensuring personal labor and cultural rights, as well as protection from discrimination. This holistic approach, encompassing three dimensions, holds better prospects for lasting prosperity. The notion is a relevant and useful tool, adaptive to local contexts, the value of which is demonstrated in policies, strategies and plans, as well as in everyday activities, and behaviors, creating solutions and adapting.

3.2.2 A sustainable city concept incorporates eco-friendly practices, green spaces, and supporting technology into the urban environment to reduce air pollution, and carbon dioxide emissions, and to enhance air quality and to protect natural resources. A sustainable city is engineered to improve its environmental impact through planning and management; an eco-city with parks and green spaces, solar-powered buildings, rooftop gardens, and more pedestrian and cyclists than cars, etc. Green technology is helping sustain urban development, and to support green living practices—recycling, the use of energy and renewable resources in homes and office, sensors, gateways, embedded radios, and cell, and to support green living practices—recycling, the use of energy and renewable resources in homes and office, sensors, gateways, embedded radios, and cellular routes, etc., are at the heart of many sustainable city infrastructure and green building systems.

To become more sustainable, cities are creating sustainable places with clean technology, parks and pathways, and adopting urban sustainability principles and sustainable practices such as making it easier to get around without a car, providing access to public resources and green spaces, improving water conservation and waste water management, and supporting urban farming and implementing green architecture, etc. The Global Cities' Networks, in the 1980s, was the impetus for cities around the world to talk to themselves about their common problems, particularly the problem of national governments not always being the partners they

should always be to cities, as well as global dialogue on sustainable development of nations without specific concern for cities; except for the UN Habitat which is concerned for human shelter; most of which occurs in an urban context. Habitat III alluded to the disconnect between national government and local government with respect to urban planning, and that quite often, national legislation impedes achieving urban sustainability instead of assisting cities as they strive for a sustainable future. Countries were therefore requested to formulate urban policy at national level as way of promoting “thinking” urban at a national level, as well as a national urban forum that brings together stakeholders in relevant government ministries, local government, academia, businesses, and NGOs, etc.; a multi-sector, and multi-disciplinary platform to discuss and iron out urban issues and challenges. In many respects, global sustainability depends on urban sustainability, while the latter depends on mainstreaming the best practices in planning and management of cities. Contemporary planning is therefore associated with sustainable development; to facilitate development as well as conserve the environment; not merely to regulate, or prevent, or restrict change, but properly use it to secure the economy, achieve efficiency, and provide amenities in the development and use of land.

**3.2.3 Sustainable human settlements** are agglomerations with the capability of remaining in existence using resources –whether natural, financial, or human–as efficiently as possible, and doing so in a manner that makes such settlements places that people want, rather than have, to live in. In many ways, sustainable human settlements are the modern day equivalent of utopian or ideal cities of the past. The critical success factors for sustainable human settlements are multi-sector planning, access to safe and affordable housing, provision of adequate basic infrastructure, affordable and low-emission public transportation systems, and participation, and local financing, etc.

### **3.3 Planning for Resilient and sustainable Cities**

**3.3.1 Cities**, like societies, are adaptable and vary enormously in their adaptive capacity due to governance, institutions, technology, wealth, and propensity to plan. Resilience increases when cities have more adaptive capacity and decreases when they are more vulnerable. Like economies, governments, lives, natural resources and the environment, etc., cities advance or evolve through change, and occasionally change drains rather than advances. Human settlements, globally, therefore strive to develop greater capacities for resilience to future impacts–climate change, high unemployment, energy scarcity, political and economic disruption, critical infrastructure failures, and public services and resources, etc. Cities face strains on assets and resources and, within the resilience and sustainability framework, need proactive strategizing to limit the impact of acute shocks and chronic stresses that threaten cities, or wreck havoc on their foundation, on day-to-day or cyclical basis. Sudden sharp events like terrorist attacks, national and international political and economic disruptions, extreme weather and natural disasters such as earthquakes and floods, and disease outbreaks, etc., are daunting challenges and

difficult to manage without proper proactive and disaster recovery planning. Other challenges include stresses like inefficient public transport systems, high unemployment and endemic violence, as well as food, water, and power shortages or disruptions. Building a resilient and sustainable city entails planning today for tomorrow's challenges. Future-proofing plans help cities withstand potential disasters and operate self-sufficiently.

**3.3.2** According to the guidelines developed by the Rockefeller Foundation's 100 Resilient Cities' Program, cities can be made more resilient to anticipated shocks and stresses through proper planning; allowing the city to better respond to hazardous events and still deliver core services to residents, visitors and businesses, etc. Building resilience makes cities more resilient to the physical, social, and economic challenges that are a growing part of the twenty-first century. The city's capacity to withstand, respond to, and adapt quickly to shocks and stresses depends on reflective, resourceful, robust, redundant, flexible, inclusive, and integrated pre-planning and disaster recovery plans. The aforementioned guidelines demand risk assessment and evaluation of current infrastructure and vital facilities of resilient cities, as well as assessment of their institutional and administrative frameworks, financing and other resources. In addition, resilient and sustainable city planning leverages urban intelligence, or big data analytics to establish current activities and benchmarks, trace change over time, and project future occurrences, etc. This, among other things, enables city officials and administrators develop, adopt, and leverage new paradigms, technologies, and services, and economic models, etc., for future planning. Today, effective urban planning is about facilitating the development of a city's capacity to absorb future shocks and stresses to its social, economic, and technical systems and infrastructure so that it can maintain essentially the same functions, structures, systems, and identity; a capacity to prepare for, respond to, and recover from, significant multi-hazard threats—whether climate change, natural disasters, or natural resources and energy scarcity, or terrorism and the like—with minimum damage to public safety and its economy and security.

**3.3.4** The new reality of fierce volatility and vulnerability has rendered prostrate old assumptions of stable social, economic, and environmental systems. Future resilience and sustainability of cities, hinge on new, adaptive, resourceful, robust and resilient systems. Planning approaches and institutions of the future, need adequately respond to the threats, or acute shocks and chronic stresses ahead, to be effective. The era of resilience and sustainability planning demands, among others, adopting a new, robust and flexible, and multi-scalar, framework etc., one that can survive and function under extreme, stressful and unique, conditions, as well as lead communities to a stronger, more sustainable future, including opportunities for accessible community engagements, and helping businesses manage demand, etc. In addition, stronger infrastructure that connect people to opportunities and protect residents from the effects of climate change, climate migration, broadband accessibility, and micro-mobility are also necessary planning functions. The new urban planning has to also focus on health and well-being through the provision of public spaces, access to nature, and other elements of the built environment

which impact not only physical but also mental health, as well as offer respite from the impacts of climate change. In addition, urban sustainability denotes a city's capacity to organize itself with minimum reliance on its hinterland, and power itself with renewable energy, as well as creating the smallest possible ecological footprint, and produce the lowest amount of pollution possible, recycle or convert waste to energy, and keep to the barest minimum the city's overall contribution to climate change, etc. City services should also be decentralized, networked and locally supplied, while infrastructure should be designed to withstand dramatic changes like prolonged periods of extreme temperatures, floods, droughts, etc.

**3.3.5** According to the World Bank Group, building a city's resilience, or a city transiting from a current to a more resilient state requires, among other things, updating building regulations and land use planning; training, education, and public awareness; environmental protection and strengthening of the city's ecosystem; effective preparedness, early warning and response; and recovery and rebuilding plans. The scope and type of city resiliency and sustainability initiatives and programs include the following.

- i. Create places of refuge.
- ii. Build higher rain flow, flood-proofing buildings.
- iii. Provide shade around buildings, in public spaces, etc.
- iv. Reduce vulnerability to wind damage, heavy rainfall, etc.
- v. Stabilize slopes susceptible to landslides, erosion, fire, etc.
- vi. Fortify systems for outages—back-up power, heating/cooling and ventilation, water, lighting, etc.
- vii. Use of passive heating/cooling to minimize energy use.
- viii. Switch to locally produced renewable energy.
- ix. Establish operations plans—energy communications, protecting records/inventory, securing interior environments.
- x. Understand the needs of citizens (people) and businesses during crisis.
- xi. Fortify rapid transit bus, train, and metro infrastructure and networks for possible crisis.
- xii. Ensure connectivity, state of repair of traffic and walking or foot traffic, bikes, pedestrian crossings, etc.
- xiii. Ease access to locally grown food or community-supported agriculture.
- xiv. Ensure reliable internet connectivity; deploy mesh network to deliver robust internet even if every node in the network fails.

**3.4.1** Necessarily, (city) resilience-targeted actions are impact-focused, priority initiatives/projects that improve the lives of the poor and vulnerable; and regionally-driven activities tailored to the needs of member-cities; and partnership-based network to attain self-sustainability in the near future. Within the framework developed under the Rockefeller Foundation's 100 Resilient Cities program, building resilient cities entails constant learning, the ability to rebound quickly from disaster, limitations and potential failures, and flexibility. A successful roadmap

to resilience typically entails the following.

- i. Financial and logistical guidance for establishing an innovative new position in city government, a Chief Resilience Officer who will lead the city's resilience efforts.
- ii. Expert support for development of a robust resilience strategy.
- iii. Access to solutions, service providers, and partners—private, public and NGOs—who can help develop and implement the resilience strategies.
- iv. Membership of a global network of member cities who learn from and help each other. As the city resiliency movement grows, cities can help individual cities become more resilient through sharing lessons learned and best practices, and support the development of a global practice of resilience among governments, NGOs, the private sectors, and citizens.

### **3.4 Some Global Resilience Building Outcomes**

**3.4.1** A Global network of cities grappling with climate change and urbanization is catalyzing the urban resilience movement, helping cities maintain a closely knit alliance and enabling collaboration and knowledge-sharing. This is also facilitating greater access to tools and expertise to support and drive urban resilience action. More cities building resilience helps individual cities become more resilient through sharing lessons learned, and supporting the development of a global practice of resilience among governments, NGOs, the private sectors, and citizens.

**3.4.2** The 100 Resilient Cities (100RC) Program of the Rockefeller Foundation has been succeeded by the Global Resilient Cities Network (GRCN). The new organization came on board at the 10th session of the World Urban Forum in Abu Dhabi, United Arab Emirates in 2020. GRCN is to continue to work with cities and between cities, to enable collaboration and inclusion, and to leverage the tools and expertise already available, as well as support the global community of practitioners and drive urban resilience action to protect vulnerable communities, including practical ways cities can build resilience and reduce disaster impacts, etc.

**3.4.3** The spate of city-resilience movements is already yielding dividends in form of a harvest of urban resilience reports/studies such as the recent report by the international real estate company, Grosvenor Group. It assessed the resilience of “most important” cities on the basis of environmental and social vulnerability and adaptive capacity. The 50 cities reported on were ranked according to vulnerability, adaptive capacity, and overall resilience, using over 100 independent datasets.

- i. **Vulnerability** was assessed under five themes—**climate** (sea level change, hurricanes and typhoons, floods, droughts, mass movement of population, earthquakes and tsunamis); **environment** (including pollution of all kinds, and overconsumption of land resources); **resources** (energy food and water); **infrastructure** (housing, transport, and basic

utilities); **community** (affordable housing, education and health facilities, religious and cultural freedom, crime-free living conditions, honest government, and fair business environment).

- ii. **Adaptive Capacity** included five areas, Governance, institutions, Technology and learning, planning systems, and funding structure. To assess adaptive capacity of planning systems, the study looked at comprehensive disaster management plan, and emergency procedures, and risk-based land use planning.
- iii. **Overall resilience**, was a combination of vulnerability and adaptive scores, where resilience decreases with greater vulnerability and increase with more adaptive capacity.

The outcome of the study revealed three most resilient cities (Toronto, Vancouver and Calgary), with a strong combination of low vulnerability and high adaptive capacity. All three cities are Canadian and have high resource availability, and are well governed and well planned. The next set of five cities includes Chicago, Pittsburgh, Boston, Washington DC and Atlanta, all of them American cities. They have strong adaptive capacity due to availability of resources and technology, as well as the accountability of their elected officials.

The bottom 20 cities, which include Mexico City, Sao Paulo, and Mumbai, etc., have low resilience due to low adaptive capacity and high vulnerability arising from inequality, poor infrastructure, environmental degradation, and climate vulnerability. Within this group are cities with the highest forecast population growth, some of which are also deficient in democracy, a long-term hindrance.

### 3.5 Resilience & Sustainability of Nigerian Human Settlements

3.5.1 Nigerian human settlements developed largely in a manner that maximally exposes them to stresses and shocks; most were not planned, while even those planned were never implemented. The vulnerability, or lack of resilience of Nigerian settlements is evident from the myriad of urban challenges—inadequate water supply and sanitation, poor waste management, slums and squatter settlements, poor transport systems, pollution (air, water, land, and visual and noise), poverty, unemployment, etc. These challenges are exacerbated by mounting hazards associated with extreme climate change, as well as inadequate planning, and the absence of city governance and administrative management structures, and limited capacity for data gathering and forecasting tools, lack of professionals and equipment, etc. Other challenges include communal clashes, epidemics and pandemics, and general insecurity from banditry and kidnapping, herdsmen attacks, etc.

3.5.2 Within the last decade, a number of Nigerian cities keyed into the global city resilient

and sustainability movement. The 100 Resilient Cities (100RC) Program of the Rockefeller Foundation, which is dedicated to helping cities around the world become more resilient to the physical, social, and economic challenges of the twenty-first century and beyond admitted the first Nigerian city—Enugu—in December, 2014. Enugu became one of the top 100 Resilient Cities of the world, and was followed by Lagos in February 2016. The Nigerian Resilient Cities Network (NRCN), an organization for the advancement of resilience thinking across the country and for the promotion and reflection and innovation in applying resilience to the political-economic context of Nigeria, was launched in 2016. As at 2017, NRCN had enrolled nine Nigerian cities (Enugu, Lagos, Abuja, Port Harcourt, Kaduna, Minna, Bauchi, Kano and Katsina). More Nigerian cities may have since embraced the resilience city networks.

3.5.3 In 2016, the Zaria Declaration of the Nigeria Resilience Cities Network laid down the framework for Nigerian Cities Resilience based on the following pillars.

- i. City Advocacy.
- ii. Local Government autonomy with accountability.
- iii. Integrating informal areas.
- iv. City resilience strategies and urban planning.
- v. Peer learning.
- vi. Stakeholder engagement.
- vii. Local land markets and tenure system
- viii. Development control.
- ix. Local revenue generation.

3.5.4 Pursuant to its mandate to ensure adequate and sustainable housing delivery, and maintenance of conducive living environment that meets the needs and aspirations of inhabitants of human settlements in Nigeria, and to provide technical and financial assistance to States in the preparation and implementation of urban, sub-regional and local plans as provided for in the Nigerian Urban and Regional Planning Law Cap N138 LFN 2004, the Federal Ministry of Works and Housing commissioned Urban Resilience and Sustainability Plans in a number of Nigerian cities. The plans to mitigate climate change in Makurdi–Benue State and Lokoja–Kogi State, and Asaba–Delta State, respectively were submitted to ministry in 2020 and are yet to be handed over to the concerned State governments for implementation.

3.5.5 In sum, aside infrastructure failures, Nigerian cities are deficient in technical expertise and professionalism, governance structures and processes to adequately address urban resilience and sustainability issues. There is also a general lack of understanding of the interdependence of urban areas and their hinterland, and between urban areas and their ecological footprints, etc. Highlights of the deficiencies are as follows.

- a. State ministries and urban development authorities, etc. whose mandates cover the

whole State are ill-equipped to drive city-level resilience building actions.

- b. Unplanned rapid urbanization, changing demographics, and limited expertise and other tools for assessment of risk, uncertainties, and development indices, etc., have limit what cities can initiate and successfully implement and manage, etc. in terms of building city resilience and sustainability.
- c. The problem of jurisdiction of the local governments and development areas in relation to the urban areas they cover, etc. precludes proactive and sustainable planning and implementation of city resilience strategies and actions.
- d. Lack of expertise to manage the complexities of Nigerian cities forecloses proactive actions, the absence of early warning systems, and limited capacity to respond, coordinate and collaborate.
- e. The absence of stable institutional and financial framework at city-level dedicated to funding city development, including foreign aid, development assistance, etc. limits the availability of investment resources for building city-resilience and other sustainability initiatives..
- f. The NRCN, with potential to provide the intellectual resources and tools for stakeholders' capacity building and knowledge sharing among Nigerian cities, as well as peer-learning and stakeholder engagement, is non-statutory and weak. The organization collaborates with global organizations such as the 100 Resilient Cities Network, UN-Habitat Urban Resilience Program, Nigeria Infrastructure Advisory Facility (NIAF) of the Department of Foreign and International Development (DFID), US Agency for International Development (USAID), Max Lock Centre University of Westminster and Commonwealth Association of Surveyors and Land Economists (CASLE), etc. However, NRCN resources are not fully benefitting Nigerian cities, largely due to lack of political will and buy-in by the different stakeholders and other players in the Nigerian built environment. This is inimical to the growth of a city resilience movement among Nigerian cities.
- g. Lack of meaningful long-term investment arrangements for municipal services and related contractual arrangements, including funding of city resilience building, due to the general climate of uncertainty and insecurity of tenure occasioned by the short time-scale of state and local government administrations. City resilience actions are not bankable under current institutional arrangements, and budgetary funding uncertainties result to abandoned or delayed projects, including building city resilience and sustainability.
- h. Policy inconsistencies, poor coordination and lack of synergy between Federal, state

and local governments, with respect to governance, administration, management of Nigerian cities, and development of city infrastructure, data gathering and forecasting tools, financing resilience activities, etc. present further obstacles to building urban resilience and sustainability.

### 3.5.6 Case Studies of Nigerian Cities' Resilience Building Initiatives

3.5.1 **Enugu** (Coal City), prior to its resilience building initiative, was exposed to several urban challenges/vulnerabilities. These include scour and erosion, poor transportation infrastructure, unreliable power supply which compelled residents to rely mainly on petroleum generators and which put great strain on the system and on the environment, urban violence, high unemployment and underemployment, and lack of amenities and affordable housing, among others. The Sullivan Chime administration, which transformed the city's road network and put in place a state of the art electronic security system, improved electricity, street lighting, drainage and walkways, as well as parks and recreational facilities, and fire fighting station and affordable housing, among others, propelled the coal city to the world's 100 Resilient Cities; the first Nigerian city to join the global resilient cities network. The aforementioned resilience building actions showed that the city had planned for resilience to decrease vulnerability and enhance its capacity to navigate the shocks and stresses of an increasingly complex twenty-first century. This demonstrated vision for resilience and long-term commitment to cutting across silos of government and sectors of society, and attention to the needs of the poor and vulnerable was, at the time, a model for other network cities that seek to build their own resilience.

3.5.2 **Lagos**, a coastal location and the most urbanized and most vibrant economy in Nigeria, with 40% of its total land area as water bodies and wetlands and a population growth rate of about 3.2 % per annum, has climate change, population growth, intense migration and rapid urbanization and other urban challenges. The city is vulnerable to coastal erosion and flooding, and is plagued by inadequate transportation and chronic traffic congestion, erratic power supply, high unemployment and underemployment, disease outbreaks and urban fires, as well as building collapses, poor waste management and sanitation, and suffers inadequate urban infrastructure and basic amenities, etc.

The Lagos resilience strategy and its implementing plans towards a stronger and more resilient city that is able to adapt to the demands of the twenty-first century and beyond, were launched in collaboration with African Global Resilient Cities Network. Described by the Lagos State Government as a strategy of affordable, scalable, replicable, and measurable interventions, the Lagos Resilience Strategy provides a framework for improving the capacity of Lagos to respond to present and future shocks and stresses. The strategy articulates an integrated approach to build a city that is efficient, innovative and inclusive, and to survive, adapt, and grow inspite of its multi-faceted challenges. The strategy also aims to create an inclusive environment, offer

quality governance and build infrastructure that empowers both residents and businesses to thrive and grow sustainably; as well as provide for or include the poor and vulnerable. The strategy contains 3 pillars, 10 goals and 31 initiatives within a framework to improve the city's response capacity, and alignment with the State's Development Plan and the Sustainable Development Goals. The following are among the planned interventions for speedy transformation of Lagos to a more resilient state.

- i. Combat flooding
- ii. Stop hazard planning
- iii. Improve emergency response
- iv. Improve health care services
- v. Achieve a robust, multi-modal and integrated transport system,
- vi. Empower the youth; and
- vii. Empower the poor and vulnerable, etc.

The strategy identifies the following critical success factors—mainstreaming resilience, collaborative engagement, and monitoring and evaluation. Feelers are that the resources to invest in the sectors mapped out to strengthen the city's resilience and ensure its survival are not easily available, and that some provisions of the strategy have either become obsolete, or unrealistic, or irrelevant, or have been overtaken by events, etc.

#### **4. The way forward**

- 4.1 Physical planning remains a veritable tool, a special purpose vehicle for, among other things, actualizing or building resilient and sustainable human settlements in Nigeria. Proactive, effective, and knowledge-driven and skilled, planning, within a holistic, urban, robust, flexible and multi-scalar framework, etc., which can deliver better functioning, and energy efficient spatial structures and systems; and create sustainable, livable and dynamic cities.
- 4.2 The Federal Government should give full effect to the Nigerian Urban and Regional Planning Act, 1992. Cap N138 LFN 2004. And, in particular, formulate appropriate policies for Urban and Regional Planning and Development; and ensure that the States each has a functional Urban and Regional Planning Tribunal to hear planning appeals as provided in the enabling Act; and also ensure that three bodies established by the Act for the proper implementation of the National Physical Development Plans, including the National Urban and Regional Planning Commission are functional and effective, etc.
- 4.3 The Federal Government should establish a Ministry of Physical Planning to oversee the orderly and sustainable development of the Nigerian built environment.

- 4.4 Nigerian planners—professionals, officials, and policy makers, etc.—should re-think how we use space in our cities and how we regulate its use, and act on the basis of a sound and proper understanding of urban dynamics (relationships and interactions), reliable data and diagnostics, appropriate methodologies, indicators and other tools and parameters for resilience actions, strategies and plans, etc.
- 4.5 Nigerian cities should be planned, built, and managed so as to ensure transformability towards sustainable and harmonious development.
- 4.6 The Federal, State, and Local Governments; developers; and urban planners, etc., should ensure that Nigerian cities are developed, financed, governed, and managed to renew existing systems and infrastructure and ensure that new infrastructure is smarter, sustainable, and more efficient.
- 4.7 The Federal Government should assist Nigerian cities develop sustainable urban infrastructure across different jurisdictions, and also put in place appropriate legal and institutional frameworks to facilitate sustainable development of urban infrastructure.
- 4.8 Federal, State, and Local Governments should harness the power that cities have to curb global warming amidst fundamental management challenges in energy, and building and transport sectors; promote growth of diverse and compact cities; Meet complex challenges in the city such as promoting a cohesive social life and a competitive economic base, while simultaneously preserving agricultural and natural systems crucial to soil, energy, and natural resources.
- 4.9 Physical planning and development authorities, at Federal, State and Local government levels should adopt slum clearance programs, informal settlements upgrading, land sharing, housing side solutions and land formalization, etc. in order to upgrade the quality and functionality of Nigerian cities.
- 4.10 The Federal Government should empower cities by facilitating access to development finance for urban infrastructure and for investment in building resilient and sustainable urban settlements.
- 4.11 The Federal, State, and Local Governments should provide appropriate policy and institutional framework for collaboration with the private sector, particularly real estate developers, on sustainable real estate markets that support the implementation of SDGs especially SDG11 about cities.
- 4.12 The Federal Government should implement policies that foster emission-free alternatives

and ensures access to affordable, reliable, sustainable and modern energy.

- 4.13 The Federal Government should spearhead implementing low carbon urban development strategies sooner than later.
- 4.14 Planning authorities should update Building Codes to incorporate mitigation and adaptation standards in order to address climate change in the building sector.
- 4.15 Planning authorities should develop guidelines contemplating climate standards, for urbanization planning, in order to achieve a low carbon and climate resilient development pathway compatible with keeping global warming within the tolerable limit of 2°C.
- 4.16 City authorities should embrace energy efficient public transport systems and modify existing transport systems to reduce the sector's cumulative energy expenditure and emissions.
- 4.17 Government at all levels should embrace "green urbanization"—approach to sustainable development by mobilizing private capital to spur green growth, by attracting both private and public capital into rapidly growing urban areas, as well as the secondary cities, to ensure competitive, inclusive and green urbanization.
- 4.18 Nigerian cities should invest more in clean energy, water supply, sanitation, better transport, and mobility, etc.
- 4.19 More Nigerian cities should leverage the NRCN, the African Global Resilient Cities Network, as well as the GRCN to strengthen capacity building, enhance coordination and collaboration, access tools and information and experience sharing, as well as global best practices in city resilience building.
- 4.20 Federal and State Governments, and other stakeholders in the Nigerian built environment should strengthen and further empower and politically support NRCN to be more effective in promoting and supporting a vibrant Nigerian Resilient City Movement.
- 4.21 The Nigerian Institute of Town Planners and the relevant federal ministry should play more active and consistent roles particularly with respect to coordination and standardization of city resilient strategies, programs, and the like.
- 4.22 States and Local planning authorities should resist new development beyond the designated city limits, as available urban tools don't seem to work beyond a certain size.

- 4.23 Involve and adequately educate people to embrace an eco-centred approach.
- 4.24 All stakeholders in the Nigerian build environment should ensure sustained good relationships within the sector—i.e. between urban planners, designers, the city government, and above all citizens.

## 5. Summary and Conclusion

- 5.1 Human settlements in Nigeria have high vulnerability to the impacts of acute shocks and chronic stresses—natural or man-made, day-to-day or cyclical, sudden or slow-burn, economic, social, or environmental, etc. This is so, largely, as a result of the manner in which the settlements developed; most were not planned and those that were planned were never implemented.
- 5.2 The myriad of urban challenges wrecking havoc on the foundation of nearly all Nigerian human settlements is indicative of a related ailment, or co-morbidity—low adaptive capacity which severely constrains the ability of Nigerian human settlements to survive, adapt, recover, and grow post disaster (shock/stress). The situation is further exacerbated by the effects of rapid urbanization and shifts in population and, most especially, the impacts of extreme climate changes particularly in coastal, riverside, and low-lying and similar locations. Worsening inequality, crisis of urban infrastructure failures, environmental degradation, and disasters associated with extreme weather, as well as several other natural and man-made disasters continue to stand in the pathway of Nigerian human settlements' transiting to a more resilient state. The proactive, adaptive, holistic, and multi-scalar approach that is crystallizing from the resilience and sustainability framework, as new pathway to create dynamic, livable, climate-ecological, inclusive, resilient, and truly regenerative or sustainable human settlements represents a major shift in the way we understand the dynamics of cities as major human settlements, and how they are planned, developed and administered, etc. to reduce vulnerability whilst enhancing adaptive capacity.
- 5.3 In retrospect, the reactive rigidities of physical planning of the old order, based on the dominant paradigms which principal modus operandi is to regulate, or prevent, or restrict development/ change, is incapable of delivering resilient and sustainable settlements. The acute shocks and chronic stresses threatening, or straining the assets and resources of human settlements particularly cities, need to be approached contained and mitigated with proactive strategizing, etc. Proactive and effective physical planning is a veritable tool to secure the economy, achieve efficiency, and provide amenities in the development and use of land, as well as to ensure efficiency in the use of available natural, financial, and human resources sustainably. The capacity of Nigerian settlements particularly

cities to prepare for, respond to, and recover from significant multi-hazard threats, with minimum threats to public safety, the economy, and society, crucially depends on such practical physical planning measures as updating building regulations and land use planning to incorporate mitigation and adaptation standards; developing guidelines contemplating climate change; modifying and adapting transport systems and adopting energy efficient options; upgrading slums and informal settlements; leveraging urban intelligence through the use of big data analytics to benchmark, trend, and to project in order to enhance the quality of decision-making, including the choice of what to adapt, adopt, or leverage in terms of new paradigms, technologies, services, as well as economic models, etc., for future planning, and to create resilient, sustainable, livable and dynamic human settlements, etc.

- 5.4 In this regard, the Federal Government should demonstrate true partnership it should always have with Nigerian cities, and so create a federal ministry that will be solely responsible for physical planning, and also put in place the necessary institutional and urban policy frameworks, to promote “thinking urban” at the national level, and to bring together relevant stakeholders to discuss and iron-out urban issues and challenges on a sustainable basis. The federal government should also fully implement the Nigerian Urban and Regional Planning Law 1992, and give full effect to the provisions of that Act regarding setting up the necessary institutions and structures for planning and managing Nigerian human settlements.

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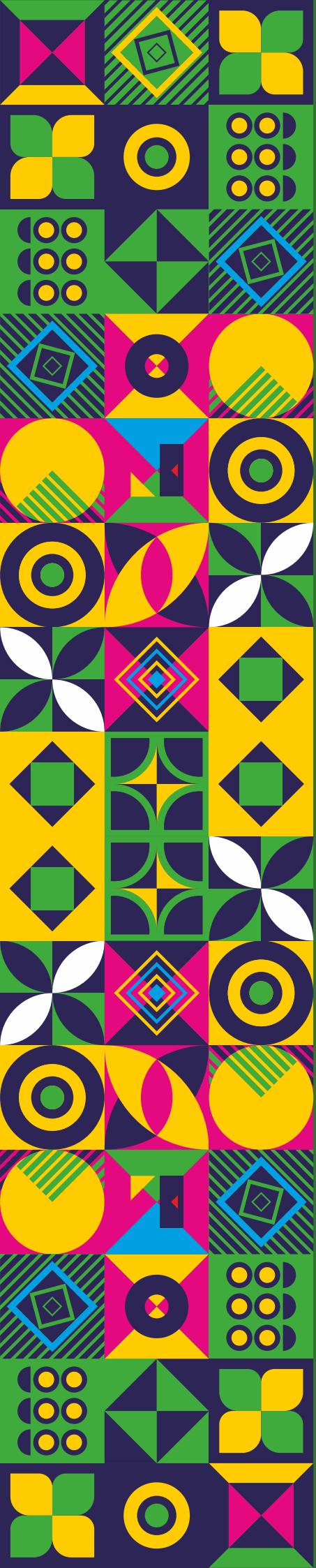
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## SECTION A

# **Challenges of Disasters in the Planning and Management of Human Settlements in Developing Nations**



## Flood Risk Management and Its Implications for Urban Resilience and Sustainability.

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### Abstract

*The prevalence of flooding is now a major global plague. Increasingly, many cities and towns across the global north and south are being affected by this environmental hazard with heavy human casualties and displacements. Therefore, flood risk management has become a critical interdisciplinary rallying point among scholars, urban planners, governments to mention a few. In recent times in Nigeria, especially in the low-lying cities of the Niger Delta Region like Asaba, the plague of urban flooding has become more recurring and distressing. Despite government's efforts towards mitigating the perennial floods in Asaba, contemporary casualties and damages owing to flooding in the city indicate that the growing volatility of flood events are now exceeding extant interventions. Consequently, the (paper examines the susceptibility of Asaba to the ravaging floods. The findings show that flash flood is the predominant flood type devastating the city. The residents acknowledge that poor planning and urban physical development particularly the nonexistence of a master plan, building on unapproved layouts, and haphazard physical development have to a great extent influenced the incessant flooding scenarios in Asaba in recent times. A centralized institution for flood risk management is lacking in Asaba and effort towards mitigating the perennial flooding tends to be reactive. The study suggests pre-*

*emptive urban planning as a more robust approach to promoting flood resilience and sustainability in Asaba and other Nigerian cities.*

**Key words:** Flood Risk Management, Resilience, Built environment, Sustainability, Asaba

## 1. Introduction

The incidence of flooding in recent decades has been extensively acknowledged as a major global threat impacting adversely on the lives and livelihoods of inhabitants of many major cities and towns across the world. Increasingly, many cities and towns across the global north and south are being affected by this environmental hazard with heavy human casualties and displacements. Over the last two epochs, floods account for 47 percent of all climate-related catastrophes, impacting over 2.1 billion people, causing major environmental interference, and resulting in over \$1 trillion of economic losses worldwide (CRED [Centre for Research on the Epidemiology of Disasters], 2015). For instance, in 2018, flooding accounted for 50 percent of the total population affected by disasters globally (CRED, 2018).

In a number of places across the globe, risk levels associated with flooding are on the rise with climate change and socio-economic developments influencing risk patterns and exposure (De Moel, Aerts & Koomen, 2011; IPCC, 2018). With the rise in the rate and intensity of rainfall driven by climate change (Kunkel, Karl, Squires, Yin, Stegall, & Easterling 2020), flood zones are likely to expand by 40–45 percent by the end of the 21st century (American Rivers, 2020). Severely impacted are coastal areas, surrounding cities and river valleys that are experiencing rapid urban growth with neither corresponding infrastructure nor planning arrangement. For several low-lying parts of the globe particularly those in the developing countries including Nigeria, the flood scenarios are overwhelming given the interplay of changing precipitation patterns and continued urban physical development in high risk areas (Jeb & Aggarwal, 2008; Nkwunonwo, Whitworth& Baily, 2016; Kulp & Strauss, 2019). The situation in Asaba, a low-lying city in the Niger Delta region of Nigeria is a typical case in point. Asaba serves as a hub of political administration and centre for social services delivery in Delta State. However, rapid urban growth in the city emerged in a largely haphazard manner since it assumed the status of a State capital in 1991. Because of this rapid population growth and urban expansion coupled with the low-lying nature of the terrain, the city is highly susceptible to urban flooding. Urban expansion, combined with the growing rate and intensity of natural hazards associated with the onset of climate change, is contributing immensely to rising risk exposure in the city.

Given the increasing impacts of and uncertainties associated with floods, there is a pressing need to develop effective strategies to reduce the flood-related risks and vulnerability, particularly in

the context of urban settings in developing countries, which are faced with uncontrolled rapid urbanisation and a complex set of social and environmental threats (Ameen & Mourshed, 2017; Capps, Bentsen & Ramirez, 2016; Wu, Geng, Tian, Zhong, Wu, Yu & Xiao, 2018). Consequently, moving from a defense-and-protect mentality towards a broader resilience and sustainable approach that employs a variety of strategies and measures to reduce and manage risks, including land-use, spatial planning and natural flood risk management measures (Dieperink, Hegger, Bakker, Kundzewicz, Green & Driessen, 2016) cannot be overemphasized. The aim of this study is to examine the susceptibility of Asaba to flooding, with a view to recommending the adoption of proactive and integrated flood risk management approach. The specific objectives of the study are to examine flood risk in Asaba; ascertain the influence of urban planning on the perennial flooding in Asaba; determine the susceptibility of Asaba to flooding; and to ascertain the extant flood risk management approach in Asaba.

## 2. Factors of Flood Generation in Urban Areas

Flood incidences are complex and dynamic in the sense that they result from a wide range of causes and do vary in scale and scope. The severity may also differ over space and time. Nott (2006) discussed two major factors that may influence surface runoff and hence flooding in urban areas. He divided them into two broad classifications namely: physical factors such as climatological forces, and human influences such as urban development and vegetation clearing. Moreover, as presented in Table 1, a list of flood generating factors was equally articulated by WMO/GWP [World Meteorological Organization/Global Water Partnership] (2008). They further argue that floods result from a combination of hydrological and meteorological factors, and are in most cases additionally influenced by human factors.

Table 1: Factors of Flood Generation

Meteorological Factors	Hydrological Factors	Human Factors Aggravating Natural Flood Hazards
<ul style="list-style-type: none"> <li>• Rainfall</li> <li>• Cyclonic storms</li> <li>• Small-scale storms</li> <li>• Temperature</li> <li>• Snowfall and snowmelt</li> </ul>	<ul style="list-style-type: none"> <li>• Soil moisture level</li> <li>• Groundwater level prior to storm</li> <li>• Natural surface infiltration rate</li> <li>• Presence of impervious cover</li> <li>• Presence or absence of over bank flow, channel network</li> <li>• Synchronization of run-offs from various parts of watershed</li> <li>• High tide impeding drainage</li> </ul>	<ul style="list-style-type: none"> <li>• Land-use changes (e.g. surface sealing due to urbanization, deforestation).</li> <li>• Occupation of the flood plain obstructing flows</li> <li>• Inefficiency or non-maintenance of infrastructure</li> <li>• Climate change affects magnitude and frequency of precipitations and floods</li> <li>• Urban microclimate may enforce precipitation</li> </ul>

Source: Adapted from WMO/GWP (2008).

A significant characteristic of the built environment is the application of impervious surfaces (Shuster, Bonta, Thurston, Warnemuende & Smith, 2005). Transformation of natural landscapes to urban areas can compromise the capability of hydrological systems to absorb, store and gradually discharge water. For instance, examining impervious surface coverage emergence as a key environmental indicator, Brody, Gunn, Peacock, & Highfield (2011) maintain that increased surface runoff resulting from additional impervious surfaces is essential since it can translate into increased frequency and severity of flooding in susceptible areas. Similarly, exploring the influence of the built environment from 1997 to 2001, Brody, Zahran, Maghelal, Grover, & Highfield (2007) observed that every square meter of additional impervious surface translated into approximately \$3,602 of added property damage caused by floods per year over thirty-seven counties. It is germane to state here that increasing amounts of impervious surface cover in urban area considerably results to higher amounts of flood as well as associated risks.

Understanding flood risk is a crucial step in managing the associated impacts of flooding as well as making informed decision in addressing such impacts (Adebayo, 2014).UNISDR [United Nations International Strategy for Disaster Reduction] (2004) established that flood

risk is perceived on the basis of three essential elements which are regularly employed in the course of flood damage assessment. These elements are likelihood of flood hazard, the degree of exposure, and vulnerabilities of elements at risk. Essentially, flood risk is largely assumed as a product of three necessary and contributory conditions which are hazard, exposure and vulnerability. However, the absence of any one of these three elements means that there is no risk (Kobayashi & Porter, 2012). Flood risk therefore is expressed as follows:

$$\text{Flood Risk} = \text{Hazard} \times \text{Exposure} \times \text{Vulnerability}$$

While risk is a contested notion with several definitions (Aven & Renn, 2009), most descriptions have three aspects in common (Becker, 2014), namely:

1. The assumption that the future is uncertain (Renn, 1998; Japp & Kusche, 2008) and that any future event is possible to influence (Zinn, 2008);
2. The uncertain future has a potential impact on humans (Renn, 1998; Renn, 2008), or can at least be so perceived (Slovic & Fischhoff, 1982); and
3. Risk is defined in relation to a preferred outcome (Zinn, 2008; Kaplan & Garrick, 1981; Luhmann, 1995).

Thus, risk is a potentially negative deviation from a preferred expected development over time. This definition may at first appear as merely complicating more conventional approaches to risk, such as a combination of probability and consequence or of events and consequences and their associated uncertainties, but even so may serve its purpose (Aven & Renn, 2009). According to Kobayashi & Porter (2012) the drivers of flood risk can be classified into hazard, exposure and vulnerability (Table 2). An understanding of these three elements that create the risk gives the needed information for the mitigation and overall management of flood risks, and at the same time contribute significantly to sustainable development and welfare of the people (WMO, 2009).

Table 2: Drivers of Flood Risk

<b>Hazard</b>	Flood hazards occur wherever land is predisposed to inundation and there is a potential for loss, damage or harm as a result of deluge. Hazard escalates with likelihood of flood; but it is also dependent upon the physical attributes of the flooding, increasing with depth of inundation, velocity of flood flows, and duration of flood. These characteristics increase the likelihood for harm and damage. Long duration flood may aggravate physical damage to buildings and foundations.
<b>Exposure</b>	There may be hazard in the absence of risk, but there cannot be risk in the absence of hazard. Flood risk only exists if there are properties that may be damaged; or if people live, or simply traverse the land where flood hazard occurs. They further assert that there is only risk since people or properties are exposed to the flood hazard. Flood risk increases with cumulative exposure to flood hazard. In other words, flood risk escalates with greater intensity of the use of land.
<b>Vulnerability</b>	Though exposure to flood hazard generates the potential for personal hazard or property damage in the course of floods, the real consequences of flooding correspondingly depend on how vulnerable individuals and assets are to danger and damage. Vulnerability relates to the classic distinction in flood damage evaluation between potential damages and actual damages. However, vulnerability is abridged if: people are more conscious of the flood risk; people are well equipped and have knowledge of what they should do in the course of flood emergency; people have access to emergency services and post-flood support; and properties are made less susceptible to destruction by water.

Source: Adapted from Kobayashi & Porter (2012).

### 3. Concept of Resilience and Sustainability in Flood Risk Management

Resilience is a key notion in sustainability science and contemporary urban flood management. However, it is also a contested notion that has gained prominence in the disaster management community over the past decade (Tierney & Bruneau, 2007; Sørensen, Persson, Sternudd, Aspegren, Nilsson, Nordström, Jönsson Mottaghi Becker, Pilesjö, Larsson, Berndtsson, & Mobin, 2016). The notion of resilience is usually used to describe (1) the ability of a system to “bounce back” to a single equilibrium (Pimm, 1984; Cohen, Pooley, Ferguson & Harms, 2011); (2) a measure of robustness or buffering capacity before a disturbance forces a system from one stable equilibrium to another (Holling, 1973; Berkes & Folke, 1998); or (3) a system’s ability to adapt in reaction to a disturbance (Pendall, Foster & Cowell, 2010). It has been suggested

that human beings have the ability not only to react to disturbances but also to anticipate and learn from them (Becker, 2014).

Urban resilience according to ADB [Asia Development Bank] (2013) is the ability to withstand and recover from unexpected shocks associated with natural hazards and climate change. Sörensen, Persson, Sternudd, Aspegren, Nilsson, Nordström, Jönsson, Mottaghi, Becker, Pilesjö, Larsson , Berndtsson & Mobini, (2016) argued that urban resilience should be viewed as an adaptive process where the society continuously learns how to cope with changing socioeconomic conditions and urban land use as well as changing climate. Similarly, urban resilience to floods can be perceived as the capability of the city to withstand flooding and to restructure should physical impairments and socioeconomic disruption arise, so as to avert damages and uphold current socioeconomic identity. It can further be conceptualized as the capacity to remain in a desirable regime while experiencing a flood. The desirable regime is defined by a set of variables reflecting aspects such as livelihood security, economic performance and mobility that collectively represent the city's socioeconomic identity (Adger, 2000; Cumming, Barnes, Perz, Schmink, Sieving, Southworth, Binford, Holt, Stickler & van Holt, 2005; Gunderson, 2010).

According to WMO/GWO (2011), the concept of integrated flood risk management has resulted to a paradigm shift. Total safety from inundations is a myth, and exploiting net benefits from the use of flood plains, rather than trying to fully control floods should be aimed at. They also argue that integrated flood risk management is a proactive approach in the direction of management of floods over the traditionally reactive approach and it is rapidly gaining recognition amongst flood managers. The proactive approach does not address floods only as an emergency or an engineering problem, but as an issue with social, economic, environmental, legal, and institutional aspects. They further maintain that the proactive approach is not restricted to a post-event reaction, but rather include preparedness (comprising flood risk awareness) and response measures to flood management at different stakeholders' levels. Sayers, Li, Galloway, Penning-Rowsell, Shen, Wen, Chen & Le Quesne, (2013) also acknowledge that flood risk management, as opposed to traditional flood defense (engineering approach) is a continuous process that attempts to exploit limited resources of time, social effort, environmental capital and money to deliver multiple benefits. They further reiterated that flood risk management stands at the intersection of many other considerations, and as such is in a pivotal position to be a positive force in promoting desired societal, environmental and economic outcomes.

Flood risk management is intricately associated with issues of sustainability. Not only does it impact the physical environment, through development control and physical planning measures, it also offers opportunities for, and constraints upon, human and natural activities in the long term (Sayers, et al, (2013). However, Samuels, Klijn and Dijkman (2006) maintain that a change from flood hazard control to flood risk mitigation in contemporary times is necessary. This, according to Kundzewicz, Hirabayashi, and Kanae (2010) is as a result of the inevitable nature

of the menace and the general view that climate change, demographic and economic activities would influence regional and global incidents and consequences of flooding in time to come. With the spontaneous growth in terms of urban physical development in a city where a robust strategic framework for controlling urban development as well as flood related hazards is lacking, the need for an integrated flood management based on indigenous physical planning strategy becomes germane. According to WMO/GWP (2011) spatial planning and the regulation of new development is a crucial aspect of integrated urban flood risk management. In developing nations in particular, the opportunity to better plan the development of new urban areas is fundamental to prevent the projected increase in future flood impacts from being realized.

#### 4. Asaba: The Case Study City

Asaba is an emerging city in the Niger Delta region of Nigeria. It is the administrative capital of Delta State. The city is located approximately between Longitude 5°00' and 6°.45' East and Latitude 5°00' and 6°.30' North of the equator. The land surface of the Asaba is dominated by low-lying plains that slope gently in a north–south direction to the River Niger. The city experiences a tropical climate given the fact that it falls within the transitional zone of AF and AW climatic types in Koppen's climatic classification scheme. Its mean annual temperatures range from 22°C to 34°C, while rainfall is between 1254 millimetres and 3032 millimetres. In addition, the study area falls within the lowland forest vegetation type.

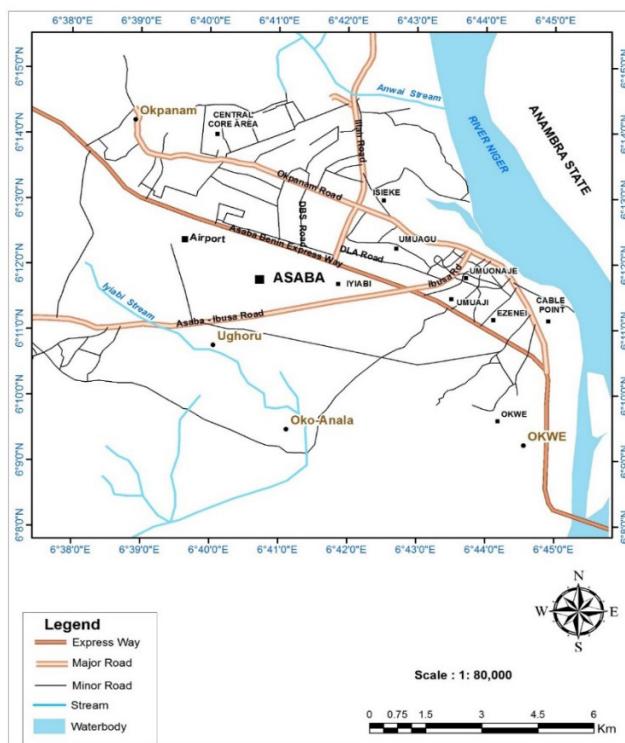


Figure 1: Map of Asaba City

Source: Researcher's Survey (2020)

Essentially, Asaba has a history of rapid urbanisation and associated land use dynamic that has been attributed to its current status as a state capital. The city is characterized with small, medium and large-scale retail shopping outlets with a wide range of small-scale industries/establishments. Even though, Asaba is located on a low-lying swampy terrain that is between 15 and 75 metres above sea level, the city was not known for urban flooding prior to its assumption of the status of a state capital in 1991. Socioeconomic changes in Asaba propelled the expansion of unfettered urban physical development activities onto marginal lands that were hitherto serving as natural basins for storm water runoffs. The areas include Iyaba stream and adjoining lands, and other strategic points that naturally drainage storm water in the neighbourhood. Asaba is the present capital city of Delta State. Arguably, Asaba is one of the cities in the Niger Delta region that has experienced flooding of diverse scale and magnitude in contemporary times. The city was built on a low-lying flood susceptible terrain.

## 5. Methodology

Survey research design was adopted. The study examined flood risk management in Asaba as well as the susceptibility of the city to urban flooding using demographic data obtained from the 2020 population estimate of Asaba. In addition, other relevant datasets employed were the year 2015 satellite imageries of Asaba with a radiometric resolution of 30m, and Shuttle Radar Topographic Mission (SRTM) satellite data with a resolution of 90m. However, these datasets were chosen based on their relevance and obtainability in the light of the study area. Essentially, the data sets were used in generating the flood susceptibility map of the study area. Also, notable flash flood hotspots in the study area were identified. The target population for the study consisted of Asaba residents. The 2020 projected population estimate of Asaba which was 148,063 was the sample frame for the study. From this population, 300 persons were chosen using Williams' 1978 formula for sample size determination as adopted by Kerlinger and Lee (2000). The perceptual knowledge of flood risk management was obtained through a structured questionnaire survey. The survey period was the peak of rainy season—a period when areas susceptible to flooding could be distinguished easily and the flood experiences of victims of floods in the city were still fresh in their minds. Stratified random and simple random sampling techniques were used to draw samples (resident) from the population in the study area. Out of the 300 copies of administered questionnaires, 282 representing 94 percent were duly completed. Personal interviews were also conducted with some professionals (Town Planners, Surveyors, Architects and Geographers). The data were analyzed using frequency counts, percentages, table summaries and ArcGIS 10.1 spatial analysis software.

## 6. Results and Discussions

### 6. 1 Flood Risk in Asaba City

The results in Table 3 depicts that flash flood is the predominant flood type ravaging the city based on the affirmation of the majority of the respondents (91.8 percent). The result also shows that flood events are experienced in Asaba every year (98.2 percent). Furthermore, the results revealed the ordeal the inhabitants go through whenever there is flood event as affirmed by 59.2 percent of the respondents who attested to the fact that an entire neighbourhood is overwhelmed whenever the city witness heavy rainfall (See Plates 1 and 2).

Table 3: Flood Risk in Asaba City

Respondents' Perceived Types of Flooding in Asaba		
<i>Types of Flooding</i>	<i>Frequency</i>	<i>Percent</i>
Flash flood	259	91.8
River flood	6	2.1
Local flood	17	6.0
Coastal flood	–	–
Total	282	100.0
Respondents' Perceived Frequency of Flooding in Asaba		
<i>Occurrence of Flooding</i>	<i>Frequency</i>	<i>Percent</i>
Do not know	5	1.8
Every year	277	98.2
Every 2 years	–	–
Every 4 years	–	–
Total	282	100.0
Major Cause of Flooding in Asaba		
<i>Nature of Flood Coverage</i>	<i>Frequency</i>	<i>Percent</i>
Set of houses are flooded	7	2.5
Entire street is flooded	75	26.6
Few streets are flooded	33	11.7
Entire neighbourhood is flooded	167	59.2
Total	282	100.0

Source: Researcher's Survey (2020).



Plate 1: A road inundated by flash flood along Okpanam road in Asaba  
Source: Researcher's Photo, 2020



Plate 1: A neighbourhood inundated by flash flood at Core Area part of Asaba  
Source: Researcher's Photo, 2020

## 6.2. Urban Planning and Flooding Risk in Asaba City

The data in Table 4 shows that majority of the respondent (78.7 percent) agrees that urban physical development have greatly influenced the incessant flooding being experienced in Asaba in recent times. This phenomenon which led to increased growth of built-up area was not accompanied with adequate planning control. Such uncontrolled physical developmental activities on the delicate topography of the city amplified the exposure of its urban population including the landscape to perennial urban flooding. Most respondents (90.4 percent) recognized the poor performance of the planning authorities in regulating physical development in the city. The above scenario is substantiated by majority of the respondents (90.4 percent) who affirmed that they are not aware of a master plan for regulating urban physical development in Asaba.

The views of experts interviewed and personal observations also implicated unregulated physical development and ineffective planning as the underlying causes of the perennial flooding in Asaba. The above findings are consistent with the observations of related studies carried out by Kousky and Zeckhauser, (2006); Ogbag and Utang (2008); and Brody et al., (2007) who found out that where urban physical development has altered the natural configuration of the land surface of an area, flooding thrives.

Table 4:Urban Planning and Flooding Events in Asaba

Perceived Influence of Physical Development on Flooding in Asaba		
Influence of Physical Development on Flooding	Frequency	Percent
Strongly disagree	12	4.3

Disagree	48	17.0
Agree	159	56.4
Strongly agree	63	22.3
Total	282	100.0

### Perceived Performance of Town Planning Authorities in Regulating Physical Development in Asaba

<i>Performance of Town Planning Authorities</i>	<i>Frequency</i>	<i>Percent</i>
Poor	255	90.4
Fair	23	8.2
Good	4	1.4
Very good	—	—
Total	282	100.0

### Perceived Knowledge of the Existence of a Master Plan for Urban Physical Development in Asaba

	<i>Frequency</i>	<i>Percent</i>
Yes	27	9.6
No	255	90.4
Total	282	100.0

Source: Researcher's Survey (2020).

### 6.3 Susceptibility of Asaba to Flooding

The degree of susceptibility of Asaba to flooding was ascertained using the weighted sum operation in ArcGIS 10.1 software. The data employed were the Landsat 1987 and 2015 satellite imageries of the study area with a radiometric resolution of 30m, and Shuttle Radar Topographic Mission (SRTM) satellite data with a resolution of 90m. The slope of the city based on the analysis of these data was the parameter used in generating the flood vulnerability map. Four classifications (low, moderate, high and very high) with respect to the degree of vulnerability of Asaba to flooding was established. "Low" represent parts of the study area that have low susceptibility to flash flood, while "moderate" and "high" depict areas in Asaba that are moderately and highly susceptible to flash flood respectively. "Very high" denotes parts of

the study area that are 200 metres away from the bank of River Niger and are at the same times very highly susceptible to flash floods, as well as river flood. A total of 17 notable flash flood hotspots is contained on Table 5.

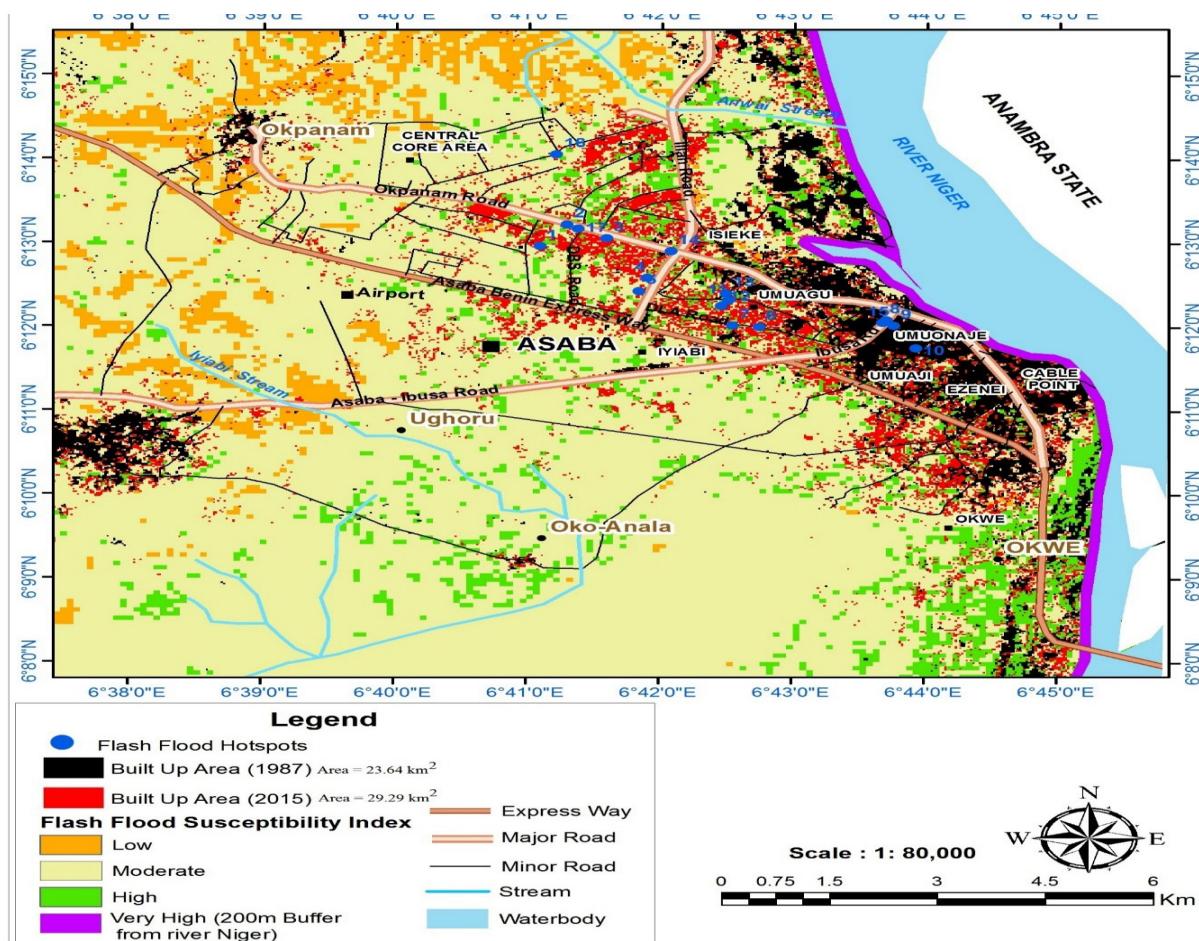
Table 5: Major Flash Flood Hotspots in Asaba

ID	Flash Flood Hotspots	Geographical Coordinates	Altitude (metre)
1	New State Secretariat	LAT 60 12I 57.36II LONG 60 41 I 5.75II	65
2	Federal Secretariat	LAT 60 13I 12.9II LONG 60 41 I 17.95II	66
3	Police Headquarters	LAT 60 13I 3.25II LONG 60 41 I 35.85II	67
4	Women Affairs Primary School	LAT 60 12I 35.05II LONG 60 41 I 56.55II	75
5	Briscoe Motors	LAT 60 12I 23.81II LONG 60 41 I 51.82II	62
6	Waste Management Board office	LAT 60 12I 0.00II LONG 60 42 I 45.06II	60
7	Standard Life (Vital Okakwu)	LAT 60 12I 1II LONG 60 42 I 33II	66
8	Umudaike Junction	LAT 60 12I 3II LONG 60 43 I 41II	66
9	Ogbeosowe	LAT 60 12I 1II LONG 60 43 I 46II	62
10	Umuaji/Umuezekwo	LAT 60 11I 45II LONG 60 43 I 56II	57
11	Jesus Saves Road	LAT 60 12I 19II LONG 60 42 I 31II	65
12	Biose Amantu Street	LAT 60 12I 15II LONG 60 42 I 28II	63
13	Agric Road (Chinedu Ezenyili)	LAT 60 12I 24II LONG 60 42 I 30II	60
14	Interbau Roundabout	LAT 60 12I 54II LONG 60 42 I 5II	64
15	Eagle Square Junction (Okpanam Rd)	LAT 60 12I 3II LONG 60 43 I 41II	63
16	Mozia (By New General Hospital)	LAT 60 14I 3II LONG 60 41 I 13II	72
17	DBS Junction	LAT 60 13I 10II LONG 60 41 I 23II	64

Source: Researcher's Survey (2020)

Figure 1 is the flood susceptibility map of Asaba. The map shows that the spatial extent of 1987

built-up area and road networks covered only 6 of the identified flash flood hotspots. While the 2015 built-up and road networks on the other hand, had more spatial coverage and covered all the 17 flash flood hotspots. The analysis also reveals that in 1987 and 2015, built-up area was 23.64 Km<sup>2</sup> and 29.29 Km<sup>2</sup> respectively, showing 23.9 percent change in terms of built-up area and road network (see Figure 1). Essentially, the analysis shows that the trajectory of the urban flood scenario in Asaba correlates with the pattern of physical development taking place in the city, as reflected in flood susceptibility map showing the extent of built-up area in 1987 and 2015, as well as the notable flash flood hotspots.



**Figure 1:** Flood Susceptibility Map of Asaba Showing an Overlay of 1987 and 2015 Built-up area in Asaba city with the notable flash flood hotspots

Source: Researchers Survey (2020).

#### 6.4 Extant Flood Risk Management Approach in Asaba

Incessant flooding in Asaba according to expert interview requires a robust physical planning framework for urban physical development and a centralized institution for flood risk

management is lacking. These bodies namely; Ministry of Environment, Ministry of Lands, Survey and Urban Development, State Emergency Management Agency, Nigeria Erosion and Watershed Management and Protection, Ministry of Works, and Delta State Capital Territory Development Agency are the major agencies saddled with the responsibility to come together as a body in light of managing environmental hazards including flooding in Asaba. Although, each of the aforementioned agencies has its specific role with respect to mitigating flood hazard in Asaba, expert interviews revealed that the roles of these agencies with respect to management of flood risk and related environmental hazards tend to be reactive rather than being proactive. They further affirmed that synergy among these stakeholders is equally poor as the Ministry of Environment which happens to oversee the activities of the agencies sometimes takes certain key action without the consent of the other stakeholders. Findings also revealed that the State Government have made concerted efforts to mitigate the perennial flood devastating the city, particularly in constructing drainage channels in some parts of the city but most of the drainage channels are not functional and not linked to discharge outlets.

## 7. Conclusion

Flooding in recent times have become a threat to life as well as the sustainable growth and development of most cities around the world including Asaba. The menace from flooding has continued to rise as a consequence of haphazard rapid urban physical development that is taking place and the influence of climate change-induced rainfall. However, the need to address the rising flood risk associated with rapid urbanization, haphazard urban physical development and climate change has shaped contemporary physical planning policies and practices around the world including Nigeria. In spite of several established approaches for mitigating flood risk around the world, governments, as observed in this study on Asaba, have either delayed or neglected these available approaches. Promoting an integrated flood risk management approach at this point based on the findings of the study has become germane. To promote the resilience and sustainability of Asaba to flood risk, the study recommends the adoption of a balanced strategy of structural and non-structural measures that are founded on indigenous knowledge and a wide participation of affected communities and other stakeholders. The study also recommends regular update of flood risk maps for Asaba city, regulating physical development in areas that are highly prone to flood, preparation of a drainage master plan, among others—as a robust approach to ensuring the resilience of Asaba in particular and other Nigerian cities to flooding.

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# Landuse Characteristics of Flood Prone Areas in Birnin-Kebbi Local Government Area, Kebbi State, Nigeria

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### Abstract

*It is against the background of achieving resilience in distressed Nigeria communities that this study assessed the landuse characteristics of flood prone areas in Birnin-Kebbi Local Government Area. There are twelve flood prone settlements in study area, out of which three (Ambursa, Gwadagwanji, and Dagere) were randomly selected. In each of these settlements, flood plains were identified while a radius of 300 meters was delineated around the widest plain. Landuse characterization and flood risk assessment of the delineated area was done. Also 240 questionnaires were administered to adult respondent within the delineated area to elicit information on the impact of flooding. The major landuses in the study area are residential (56.73%), and agricultural (33.97%). A high intensity of farming, mostly rice plantation, is carried out in the study area and loosens the soil, making it vulnerable to flooding. About 75% of the drainages in the study area are blocked with wastes hence making water to run-off. This is worsened as developments are situated alongwater course without recourse to planning standards on setbacks. Unfortunately, while there is no landuse regulation with respect to agricultural practice, none of the developments in these areas are approved by the Kebbi State Urban Development Authority. All the sampled respondents have experienced flooding and with the Flood Impact Index (FII) of 0.22 and 0.08, the impacts of flooding in the area are displacement and loss of agricultural products. The paper therefore recommends*

*the submission of risk assessment plan as a yardstick for approval of developments in these areas. Also landuse provision should be made for agricultural practices, while resilience plan should be made for victims of floods in the study area.*

**Keywords:** Flood, Landuse Planning, Susceptibility, Resilience

## 1.0 Introduction

The rate of occurrence of natural disasters is not only alarming but concerning. In the year 2020 alone, not less than sixty major disasters took place globally, with at least four disasters taking place monthly—this displaced not less than 100,000 people (AA, 2020). Although reportedly declining, natural disasters kill an average of 60,000 people yearly, and accounts for about 0.1% of deaths over the past decade (Hannah and Max, 2019). Natural disasters, also referred to as environmental disasters, are those adverse events such as earthquakes, hurricanes, tsunamis, drought, fire and flood.

Floods are caused by complex and usually interrelated factors—natural and human induced. Increasing landuse change, intensive landuse change, construction of developments in areas that are prone to flooding as well as watercourse and deforestation exacerbates flood (Bryant, 1991). While countries, at all levels of development, are not excluded from flood, 89% of the world's flood exposed people live in the middle and low income countries (Jun and Melda, 2020). Unfortunately, these individuals, because of their level of poverty, health status, and poor health care systems, are with little or no resilience to the impacts of flood. Consequently, countries in Sub-Saharan Africa faces the greatest threat of the impact of flooding as out of the 171 million flood exposed population, at least 71 million people live in extreme poverty (Jun and Melda, 2020).

The implication of natural disasters is huge and almost irredeemable. About 17 billion U.S. Dollars was lost to the Japan's Tropical Cyclone Hagibis in the year 2019, while flood, alone, caused the damage of about 10 billion U.S. Dollars in India in the same year (Statista, 2019). Flood are the most common naturally occurring hazard and are responsible for a greater number of fatalities globally (Drocy et.al, 2013; Jonkman, 2005). Among natural disasters, floods have been reported to be responsible for almost half of the causalities (EM-Dat, 2011). Out of all the global natural disasters, flood is the highest—accounting for about 60% of the natural disasters in the year 2019. It has affected over 2.8 billion people in the world and causing over 200,000 deaths in the past three decades (Hashizume, 2013). Between 1995 and 2005, floods accounts for 47% of all weather related diseases globally (NRC, 2020). In the year 2019 alone, around 31 million people were affected by flood worldwide (Statista, 2019). Flood often cause

unmitigated damage and suffering, especially in lower income countries where infrastructure systems—including drainage and flood protection—tends to be less developed.

Floods are the most common and recurring disaster in Nigeria—and its frequency, severity and spread have continued to increase (Abdullahi and Sadeeq, 2020). High intensity of torrential rainfall and release of nearby dams in neighboring Niger, Cameroon and Beninhas caused flooding in Jigawa, Kwara, Kebbi, Sokoto, and Zamfara states affecting 91,254 individuals. Mortality rate tends to increase up to 50% globally within the first year after a major flood incident and psychological distress lingers for up to 2 years post flood disaster with a prevalence of 8.6% to 53% (Alderman et al, 2016). Many areas of Lagos are susceptible to flooding because of development of buildings on flood plain, inadequate drainage of storm water, lack of maintenance of existing drainage systems (Adenekan, 2000).He (Adenekan, 2000) went further to report that extensive landuse change and changes in hydrological watersheds in urban settlements have also increased flood hazards and risks in many parts of Lagos, most especially in slum communities.

The situation in Kebbi State is dire as vast farmlands are usually completely submerged with flood during heavy rainfall. Out of the 21 local councils, 11are inclined to flooding and, currently there are already 15 highly risk local councils which have been badly affected by the flood(Olaiya & Gbenga, 2020).Incidences of flood in the state, associated with the overflow of nearby River Rima, has led to the tremendous loss of property, infrastructure, business and increased risk of diseases. Infrastructures like roads, bridges, school, hospitals and prison were damaged, while various houses were destroyed. During the 2020 flooding in the state,the Tuga Bridge submerged—cutting border communities in the Bagudo–Tuga–Kaoje area, while a major international highway linking the state to Niger Republic almost caved in at Dukku(Olaiya & Gbenga, 2020).

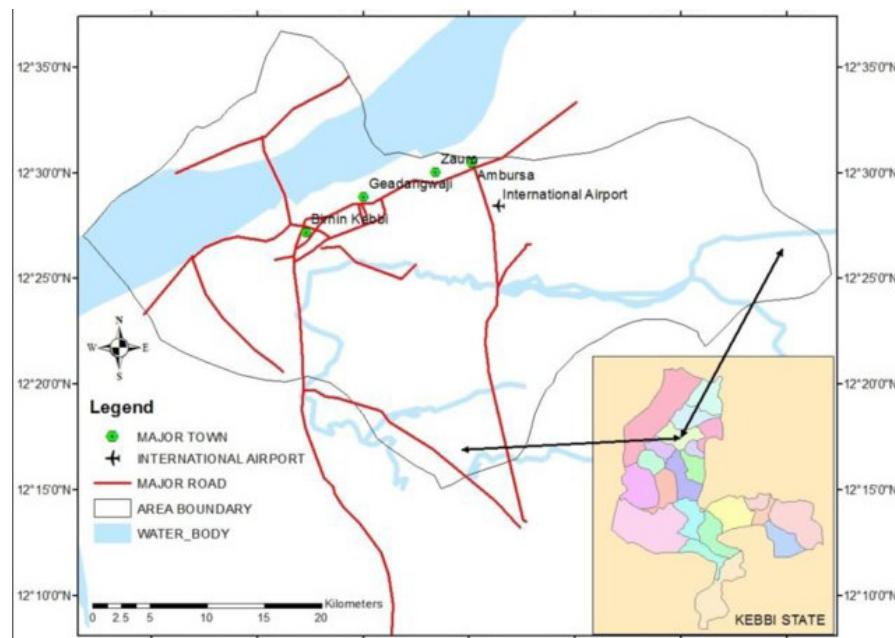
Communities in Birnin–Kebbi Local Government Area have also recorded incidences of flooding. However, unlike other places, the local government area is experiencing a high level of urbanization and peri–urban development which has further made its comprising communities to be vulnerable and susceptible to both incidence and impact of flooding. As the administrative headquarter of the state, the impact of flooding in the local government area will transends to others communities of the state, hence the need for a preventive mechanism. It is against this background that this study evaluates the landuse characteristics of flood prone areas in Birnin–Kebbi Local Government of Kebbi State, Nigeria. This is with the aim of proffering recommendations towards the prevention of the occurrence of flooding in the area and similar ones in the state. The objectives of the study are to (1) to evaluate the landuse type and intensity of developments in areas along the water course, (2) to appraise the characteristics of buildings in the flood prone areas, and (3) to appraise the impact of flood on residents in the area.

## 2.0. Study Area and Methods

Birnin-Kebbi Local Government Area, the administrative capital of Kebbi State, is located between latitude 12° 17' 14.11N and 12° 39' 34.11N, and between longitude 30° 59' 21.11E and 40° 36' 36.11N (Figure 1). The area is flat plain with an elevation that ranges between 150 and 300 meters above sea level. It is also served by River Rima—a major factor of flooding in the state. The area is characterized by low mean annual rainfall between 300m–700m from May to October, while other months of the year are dry season. The daily maximum temperature of the area is between 36°C and 40°C. During harmattan, the temperature may be lower than 17°C while in the peak of heat (i.e. between February and April), the temperature can be as high as 44°C. The soil of the area is characterized with unconsolidated sediments comprising sand, gravel, organic matter, loam, silt and plains. These sediments are conveyed by running water and wind to the flood plain of Rima. The soil provides a good ground for farming—particularly rice farming. However, it is susceptible to annual floods.

For this study, twelve flood-prone areas are identified in the local government. The flood-prone areas are directly located along the course of the river, and has had at least an incidence of flood in the past years. These flood-prone areas are Jawo, Unguwar Sani, Makera, Maurida, Uguwa Kayi, U. Mijin Nana, Uguwar Gero, Kola, Wuro Maliki, Gwadangwaji, Ambursa and Dagere. Out of these, Ambursa, Gwadangwaji and Dagere were randomly selected. In each of these areas, flood plains were identified while a radius of 300 meters was delineated around the widest plain (See Plate 1a–1c). Landuse characterization of the delineated area was done using both downloaded imagery from Google Earth Pro and physical observation. Impact assessment of flood on residents was also done. To achieve this, 240 questionnaires were administered to adult respondents in the delineated areas around the flood plains. Information elicited include types and intensity of landuse development, experience and impacts of flooding, and physical planning and other interventions at the management of the incidence flood in the area.

Data obtained were subjected to both descriptive and inferential statistics. Percentages were used to summarise the areas occupied by different landuses, while an index, Flood Impact Index, was used to summarise the impact of flood on residents in the area.



**Figure 1: Location Map of Birnin-Kebbi Metropolis**

Source: Adopted from Ismail et al, (2016)

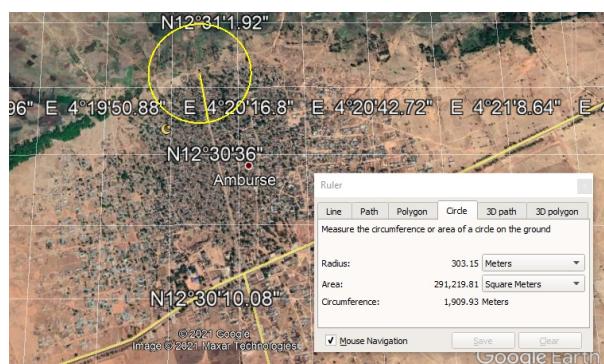


Plate 1a: Delineated Imagery of Ambursa  
Source: Google Earth, 2021



Plate 1b: Delineated Imagery of Gwadagwanji  
Source: Google Earth, 2021

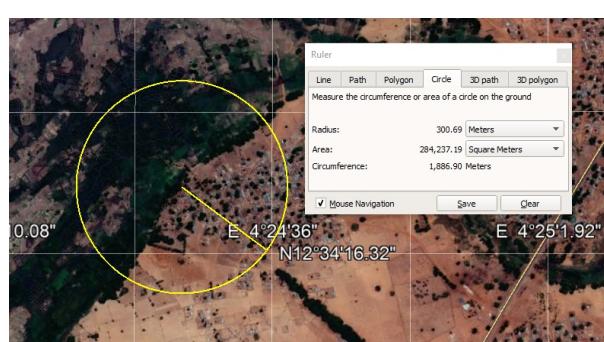


Plate 1c: Delineated Imagery of Dagere  
Source: Google Earth, 2021

### 3.0. Discussion of Findings

This section discusses the findings that were made in the study area. It is divided into three sections viz landuse type and intensity of developments in areas along the water course; condition of buildings, and impacts of flooding in the study area.

#### A. *Landuse Type and Intensity of Developments in Areas along the Water Course*

As summarized in Table 1, Residential (56.73%) and Agricultural (33.97%) are the major landuses in the flood prone areas of Birnin-Kebbi Local Government. The dominance of residential development may not be disconnected from the increasing urbanization in the settlements of the capital city. Another factor is the value attached to house ownership in Africa—where nuclearity of house ownership has continued to increase. As peri-urban area, the sampled communities are places of entrants to new comers, non-indigenes and visiting farmers to the city. Farmers leverage on the proximity of these flood prone areas to water along river course for the practice of their all-season and short term farming. The nature of soil and proximity to river also inform farmer's product decision. For instance, about 80% of the farming activities in these areas is rice plantation.

Kebbi state is a major rice producer in the country, with micro farming of the product taking place massively along the water course. Other agricultural practice in the selected areas is vegetable farming (9.20%), fruit farming (6.28%), and livestock production (2.94%) (Table 2). Extensive agricultural practices have a grave implication on the susceptibility of these areas to flood—as banks along the river course, that is to be utilized for buffer and set back, is extensively utilized for Agriculture. This exposes residents, likewise their crops, to the risk of flooding during excessive rainfalls. Also, extensive agricultural practice further loosens the soil on these banks, thereby making it more mobile and readily available for flooding.

There is a difference in the intensity of Agricultural production and the areas of residential development among the selected areas of the Local Government. For instance, as summarized in Table 1, about 60% of the delineated area in Gwadagwanji is occupied by residential development, while that of Ambursa is 55% and Dagere is 54%. It is, therefore, evident that urbanization in the core of the metropolis is deeply affecting its peri-urban areas—with those that are closer to it more affected, and such reduces with distance away from the metropolis. However, with Ambursa (39.10%) and Dagere (32.10%) compared to Gwadangwaji (30.30%), agricultural practices along the flood plains decreases with proximity to the metropolis.

Table 1: Landuse Characteristics of Flood Prone Areas of Birnin-Kebbi

Landuse	Ambursa		Gwadangwaji		Dagere		Average	
	Area	%	Area	%	Area	%	Area	%
Residential	156,573.70	55.40	171,552.77	60.70	152,899.58	54.1	160,342.02	56.73
Agricultural	110,505.98	39.10	86,765.57	30.70	90,722.30	32.1	95,997.95	33.97
Open Space	8,761.34	3.10	7,913.47	2.80	9,891.84	3.5	8,855.55	3.13
Road Network	6,782.98	5.50	6,782.98	5.80	7,065.60	2.5	6,877.18	4.60
Total	282,624.00	100.00	282,624.00	100.00	282,624.00	100	282,624.00	100.00

Source: Authors work, 2021

Table 2: Agricultural uses of Flood Prone Areas of Birnin-Kebbi

Landuse	Ambursa		Gwadangwaji		Dagere		Total	
	%	%	%	%	%	%	%	%
Rice	81.40	78.15			85.20		81.58	
Vegetables	10.00	13.50			4.10		9.20	
Fruits	5.10	4.25			9.50		6.28	
Livestock Farming	3.50	4.10			1.20		2.94	
Total	100.00	100.00			100		100.00	

Source: Authors work, 2021

### B. Characteristics of Buildings in the Flood Prone Areas of Birnin-Kebbi

As evidenced in Table 3, all identified buildings in the flood prone areas are for residential purpose. Although about 95% of these developments are single family type housing units, its high incidence portends potential risks for occupants. These buildings, as summarized in Table 4, are developed without cognizance to urban planning standards. For instance, the average setback of development to roads in these areas is 1.68meters, while that of the rear is 2.58meters, front is 3.38 meters, right side is 2.35 meters and that of left side is 2.59 meters. These are against the minimum setbacks of 3 meters for all sides, except the front (4.5 meters) and development to roads (4.5 meters)—depending on the category of such road. Non-adherence to planning standards further makes these areas susceptible to flood—even as there is no buffer between these developments and the river course. However, none of these buildings were reportedly approved by Kebbi State Urban Development Authority. This, in a way, signals the challenge of

development control especially at the emergency areas. The lack of coordinated management of these sensitive areas could have, in part, informed it.

Only 7.5% of the buildings in the flood prone areas are served with drainage, and of these, about 75% are blocked with debris. Lack of drainage in these flood prone areas have made water run offs, both to and within this area, to be uncontrolled. In areas with blocked drainages, locking wastes and debris not only erode the already mobile soils, they are further washed to the various houses and streets—thereby causing various environmental challenges. Notably, a relatively high number of drainages are found in Gwadagwanji—with about 10.2% of the households served with drainage. Absence of channels for water run-off exposes residents to flooding.

**Table 3: Characteristics of Buildings in the Flood Prone Areas of Birnin-Kebbi**

Variable	Option	Ambursa	Gwadangwaji	Dangere	Average
Purpose of building	Residential	100	100	100	100
	Commercial	0	0	0	0
	Industrial	0	0	0	0
	Mixed	0	0	0	0
Approval	Not Approved	100.00	100.00	100.00	100.00
	Approved	0	0	0	0
Drainage	Yes	6.50	10.2	6.0	7.56
	No	93.5	89.8	94.0	92.44
Drainage Condition	Blocked	98.2	100.0	95.0	97.7
	Not blocked	2.8	0	5.0	2.60
Unit of Building	Single Family type	100	100	100	100
	2–4 unit type	0	0	0	0
	5–19 unit type	0	0	0	0
	20 + unit type	0	0	0	0
	Other	0	0	0	0
Incidence of Flood	Yes	100	100	100	100
	No	0	0	0	0

Source: Authors work, 2021

**Table 4: Agricultural uses of Flood Prone Areas of Birnin-Kebbi**

Landuse	Ambursa	Gwadangwaji	Dagere	Average
Average Setback to Road Network	1.40	1.90	1.75	1.68
Average Setback to landuse on the Rear	2.50	2.30	2.90	2.56
Average Setback to landuse at the front	3.21	3.50	3.45	3.38
Average Setback to landuse on the right side	2.65	2.40	2.00	2.35
Average Setback to landuse on the left side	2.50	2.39	2.90	2.59

Source: Authors work, 2021

### C. Impacts of Flooding in Flood Prone Areas of Birnin-Kebbi

As evident in Table 5, with the Flood Impact Index (FII) of 0.22, the major impact of flooding in the study area is loss of Agricultural product. The extensive practice of farming, particularly rice farming, along the water course could have informed the degree of this impact. In 2020, over 600 kilometer of rice plantation—amounting to almost 1 billion naira, livestock and fish ponds were lost to flood in Kebbi state (Sunday Guardian, 2020). Also with the FII of 0.08, residents complain of displacement as another major impact of flooding in the areas. The last flooding in kebbi state displaced more than 5,000 individuals across multiple Local Government Areas (Gardaworld, 2020). Usually, these displacements are temporary, as residents return back to their former residences after the flood. Another effect of flooding in the study area is loss of livelihood as residents, due to the loss of their agricultural products, loses their source of livelihood.

**Table 5. Impacts of Flooding**

Variable	Ins.		Min.		Mod		Major.		Sev		$\Sigma$		x	FII =y
	F	W	F2	W2	F	W3	F	W4	F	W5	$\Sigma F$	$\Sigma W$	$\Sigma F/\Sigma W$	x-(x)
Loss of Agricultural products	156	156	38	76	8	24	18	72	20	100	240	428	0.56	0.22
Displacement	40	40	125	250	38	114	10	40	27	135	240	579	0.41	0.08
Loss of livelihood	38	38	60	120	90	270	37	148	15	75	240	651	0.37	0.03
Financial Challenges	63	63	25	50	30	90	42	168	80	400	240	771	0.31	-0.03

Loss of Properties	15	15	8	16	49	147	150	600	18	90	240	868	0.28	-0.06
Increased Sickness	10	10	30	60	60	180	45	180	95	475	240	905	0.27	-0.07
Reptile/Rodent Infestation	25	25	18	36	35	105	63	252	100	500	240	918	0.26	-0.08
Loss of Lives	10	10	8	16	40	120	39	156	143	715	240	1017	0.24	-0.10
Total												2.69		
(x)=Average												0.34		

Source: Authors work, 2021

#### 4.0. Recommendations and Conclusion

Having explored the land use characteristics and impacts of floods in the flood prone area, the following recommendations are proffered:

1. Risk Assessment Plan for Intending Developments: No doubt, because of the increasing rate of urbanization in Africa secondary cities such as Birnin-kebbi, development will keep taking place at the peri-urban areas of these cities. However, these developments must be guided. Specifically, for the flood prone areas, a risk assessment plan must be and flood area development plan should be developed. The former is to assess the risk of potential development, while the latter is to provide for buffer along the bank of the river.
2. Inter-Ministerial Development Control: To prevent further development and intensified agricultural practice in the flood prone areas, an inter-ministerial development control team is proposed. The proposed inter-ministerial development control team is to comprise of staff from Department of Urban and Regional Planning, Ministry of Land and Housing, Ministry of Environment and National Emergency Management Agency. These team will control development, specifically, in flood prone areas of the state.
3. Landuse Plan for Agricultural Practice: The state is an Agricultural oriented one-and a major producer of rice in the country. To ensure food security, sustenance of livelihood, and promote agricultural practice in the flood prone areas and the state, there is a need for development of landuse plan for Agricultural development. Such plan can provide a yardstick for the control of Agricultural practice though preventing extensive farming. This include development of Agricultural Practice Plan, establishment of farm settlements e.t.c.
4. Development of Resilience Plan: Floods are natural disasters that are exacerbated by human factors. There are about 11 local government areas that are prone to flood in the

area—hence the need for the development of resilience plan—for the management of the impact of flood on residents.

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## CHAPTER THREE

# Managing Psychosocial Impacts of Flood Disaster in Nigeria

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### ABSTRACT

*Floods have proven fatalities. While such impacts are easily quantified monetarily, the affected people are exposed to different psychosocial impacts which can last a lifetime, depending on their level of exposure to the disaster, their resilience level, and the availability of recovery facilities. This paper aims at assessing the management of psychosocial impacts of flood disasters in Nigeria. The objectives include identification of the impacts of flood disaster in human settlements; evaluation of the psychosocial impacts of flood disaster and assessment the management strategies for psychosocial impacts of disaster. A Survey research design was adopted for the work, utilizing questionnaires, interviews and observations as primary data sources, and other secondary sources in communities in Itu L.G.A, Akwa Ibom State. Relative effective Index used for the analysis disclosed that psychosocial impacts—stress, grief, anxiety and post-traumatic stress disorder (PTSD) are experienced during, and after the flood disaster. Related literatures revealed how these impacts are managed globally, thereby forming bases for policy implication for Nigeria.*

**Key words:** Flood, Disaster, Psychosocial Impacts, Resilience and Strategies.

## 1.0 Introduction

Flood is one of the most frequent type of disaster globally, and its impact is greatly influenced by the preparedness and resilience of the people affected. Flood leads to tremendous losses of property, infrastructure, businesses, increased risk of diseases and lives. Over 2.8 billion people worldwide have been affected directly and indirectly by flood, causing over 200,000 deaths over the past three decades (World Health Organization (WHO), 2020; Olanrewaju, Chitakira and Low, 2019).

Many governments' reports globally often present the impact of flood in monetary value, fatality and damages; emergency response mostly focuses on financial aids, food, and medical aids to the affected persons in the community. The actual impact of flood is beyond the destruction of buildings, infrastructure, farm lands and fatality. A sublime impact may never be evaluated financially, or redressed easily long after the flood incidence, and this is the psychosocial impact (Usip, 2020).

Disasters, conflicts and other challenges have severe psychosocial consequences. Flood, one of the major natural disasters affects people mentally, emotionally, socially, and even spiritually, and these cannot be measured financially. The loss of a loved one, a heritage site, permanent disability or exposure to scary scenes can affect an individual long after the flood event, irrespective of the material and financial aids given. These psychosocial impacts include grief, stress reactions, anxiety, emotional instability, traumas, and post-traumatic stress disorder.

Many human settlements in Nigeria have been affected severely by flood in recent times, and aids are primarily in the form of money, food stuff, blankets, clothing and medical intervention programmes. However, very little or no effort is channeled towards cushioning the psychological impacts. This paper therefore, aims at assessing the management of the psychosocial impacts of flood disasters in Nigeria.

## 2.0 Statement of Problem

The consequences of floods in human settlements and other places with anthropogenic presence such as farmlands and mining sites vary greatly depending on the location, duration, depth, speed and extent of flooding, and the vulnerability and value of the natural and constructed environments they affect (Queensland Government, 2018). Individuals and communities are sometimes affected beyond the physical damages experienced as social, economic, and environmental consequences accompany such events. Emotional instability, stress reactions, anxiety, trauma and other psychological symptoms are observed commonly after the disaster and different traumatic experiences. These psychological effects have a massive impact on the affected individuals. Physical and environmental interaction, social association and cultural

relationships are sometimes altered, and sometimes strained beyond reconciliation. Response to community settings, family structures, socio-cultural ties, and recreations (such as clubs, peer-association, passive and active recreation) are sometimes withdrawn or disconnected permanently.

While some people recover immediately after the flood incidence due to less impact exposure level, emergency intervention aids and resilience, people with high impact exposure level (such as fatal and tragic experiences), insufficient preparedness, resilience and aids experience more difficulties. In extreme cases, this leads to a number of persistent psychotic symptoms which are often severe in nature. Post-Traumatic Stress Disorder (PTSD) is the most frequently encountered along with anxiety, depression and other behavioural and psychosocial abnormalities. (Makwana, 2019). At this point, responses beyond financial and medical aids is required to walk the affected individual(s) back to recovery, normalcy and sound re-integration to post disaster life. The management of these psychosocial impacts of flood therefore becomes a necessity in our settlements today.

Whereas a lot of research have been done on the economic impacts of flood in Nigeria, only few literature exist on the psychosocial impact of flooding in Nigeria, particularly in Akwa Ibom State. This work therefore assesses the management of the psychosocial impact of flood disaster in Nigeria, using 12 communities in Itu Local Government Area of Akwa Ibom State as case study. The paper specifically addresses the impacts of flood disaster in human settlements, assessment of the psychosocial impacts of flood disaster and assessment of management strategies for psychosocial impacts of disaster.

### **3.0 Impacts of Flood Disaster on Human Settlements**

The impact of flood could be physical, medical, social and (or) economic in nature, and every flood disaster affects an individual or group of persons directly or indirectly, Mason , Andrews, and Upton (2017). As observed by WHO (2017), direct impacts are those impacts that result from direct physical contact between floodwaters and humans, economic assets, or other objects. Examples of direct impacts are the destruction of houses, crops, or livestock by floodwaters, the loss of life caused by drowning or injuries and deterioration of health conditions owing to waterborne diseases. In contrast, indirect damages are induced by direct impacts. They may occur in space or time beyond the immediate limits or outside of the flood event, such as a loss in productivity resulting from a disruption in supply chains or interruptions to flows and linkages.

These impacts are further classified into tangible and intangible impacts. Tangible impacts are effects that can be expressed in monetary terms, with existing market value. These can be referred to as goods, and they include infrastructure element, buildings, agro-products, etc.

On the contrary, intangible impacts are non saleable goods that cannot be easily quantified monetarily. Their actual true market value spans beyond monetary expressions, including medical, psychological, cultural, and social impacts. Examples include long term health effects, temporal and permanent disability, destruction of cultural heritage, and loss of a loved one.

Different fabrics of human settlements are affected by flood events. Waterborne diseases such as typhoid fever and cholera and vector-borne diseases such as malaria are rampant in the affected areas as clean water source is mainly contaminated, and contact with the polluted flood water is unavoidable. Infrastructures are always affected, and business operations and sources of livelihood are crippled during flood. Many buildings are affected during a flood, often leading to the displacement of people.

#### **4.0 Psychosocial Impacts of Flood**

The effects of flooding and disasters on people's health, relationships and welfare can be extensive and significant. Flooding can profoundly affect people's welfare, employment, mobility, wellbeing, psychosocial resilience, relationships and mental health. It can pose huge social and welfare problems that may continue over extended periods because of not only being flooded (the primary stressor), but also because of the continuing secondary stressors that arise as people try to recover their lives, property and relationships ( Health Protection Agency, 2011).

Emotional instability, stress reactions, anxiety, depression, somatization, post traumatic stress disorder (PTSD) and other psychological symptoms are observed commonly after flood disaster and different traumatic experiences. These psychological effects have a massive impact on the concerned individual and also on communities. ( Usip, 2020).

Psychosocial impacts are categorized into immediate experience and post event experience. The immediate experience reflect the most horrifying dimensions of disaster related to severe physical injury, exposure to extreme danger, witnessing death of close ones or mass dead and injuries, traumatic experience of helplessness, hopelessness, separations, and the need to choose between helping others or fighting for one's own survival. The Post Event Experience reflects post-disaster reactions which include intense feeling of anxiety, which may be accompanied by flashbacks or intrusions and frightening memories of the experience.

These symptoms are expected to settle over the first weeks. Where these reactions are maintained at a high level, and for over few weeks, they present a post-traumatic stress disorder (PTSD). Spontaneous recovery occurs in the majority of cases as observed in WHO documents, but in a small proportion, the conditions can last many years, and in very some cases a life time. The major types of psychosocial impacts of flood include Post-Traumatic Stress Disorder, grief and anxiety, substance abuse, and secondary psychosocial stressors. Generally, the psychosocial

impact of flood in any society is influenced by the size of its vulnerable population, talking about children, women and dependent elderly population because of their special needs (Makwana, 2019). Other factors are

Resilience Level, which refers to the ability to adapt to and recover quickly from casualty or disasters. This is further influenced by individual's level of preparedness and awareness of the potential disaster, experience, technology, economic status, infrastructure among others and the availability of intervention Programmes and Disaster Exposure Level

## 5.0 The Study Area

This study was conducted in twelve (12) communities in Itu Local Government area of Akwa Ibom State, Nigeria. The Local Government Area occupies a landmass of approximately 606.10 square kilometers. It is bounded in the North and North-East by Odukpani in Cross River State and Arochukwu in Abia State, in the West by Ibiono Ibom and Ikono Local Government Areas, in the South and South-East by Uyo and Uruan Local Government Areas, respectively. Fig. 1 shows the location of Itu L.G.A in relation to other Local Government Areas in the state.

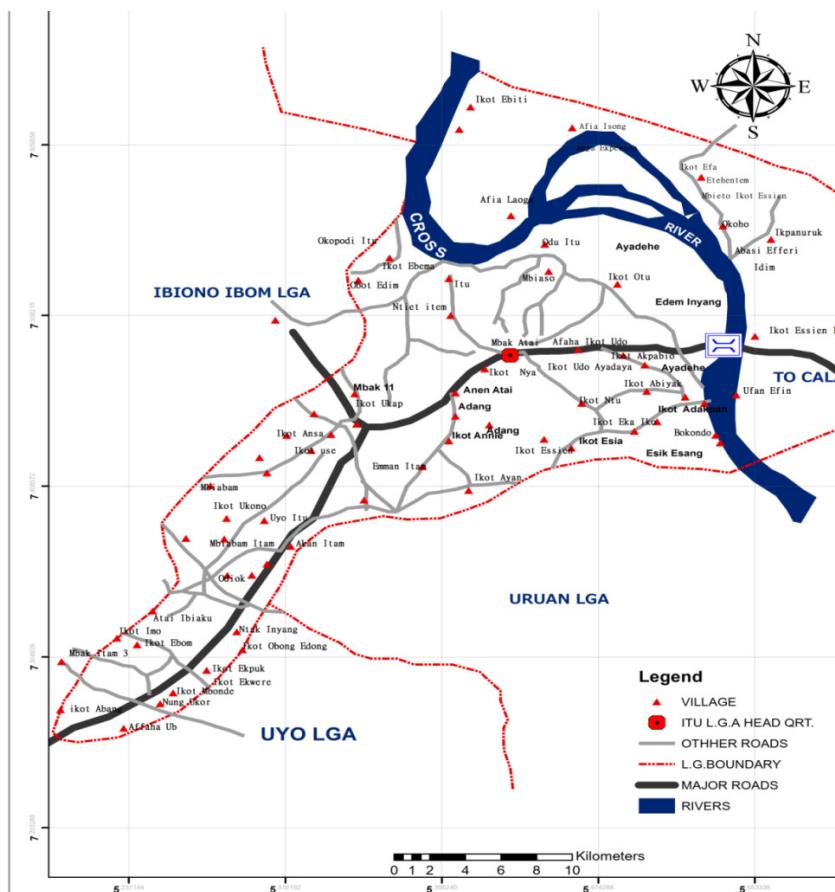


Fig. 1 Map of Itu Local Government Area

Source: Ministry of Lands, Surveys and Town Planning

**The Case Study Community:** The 12 communities selected for the study are OduItu, Okoho, EdemInyang, Akpaekpeneton, AfiaIsong, IkotOtu, Etehentem, MkpanUruk, MbenInyang, Mbiabo, IkotAdakpan, and Ayadehe. All the communities are located in the North-Eastern Part of Itu by the Cross River.

## 6.0 Methodology

The Research design adopted for the study was the survey research design. This includes observations and interactions using various media with the affected people in the settlements investigated. The data needed for this study covers identifying the impacts of flood disaster in human settlements, assessing psychosocial consequences of the food disaster, and finally assessing management strategies for psychosocial impacts. The data were collected using both the primary source and the secondary data source. A Purposive sampling technique was adopted for the study. The Sample frame was determined by the official documents of the Akwa Ibom state government which outlined areas with persistent flood challenges. Four hundred questionnaires were administered across the communities investigated, based on their population as presented in table 1 using a random sampling technique.

**Table 1: Populations and Sampling Distribution**

S/N	Settlements	Population	Sample Size	Percent %	Rate of Return
1	OduItu	868	22	5.5	20
2	Okoho	798	20	5	19
3	EdemInyang	1022	26	7.5	25
4	Akpaekpeneton	980	25	6.3	24
5	AfiaIsong	1176	30	7.5	28
6	IkotOtu	1099	28	7	27
7	Etehentem	854	22	5.5	21
8	MkpanUruk	728	19	4.7	18
9	MbenInyang	672	17	5	15
10	Mbiabo	1358	36	9	35
11	IkotAdakpan	1722	45	12	44
12	Ayadehe	3906	100	25	98
	<b>Total</b>	<b>15,183</b>	<b>390</b>	<b>100</b>	<b>374</b>

Source: Author (2021)

The data generated from the field work were presented using tables and chats, and analyzed using Relative Effective Index. The result of the study can be applied in other regions in assessing the impacts of floods and their psychosocial consequences.

## 7.0 Data Presentation and Analytical Discussion

### Identification of the Impacts of Flood Disaster in Human Settlements

The impacts of flood in human settlements are deduced from investigations carried out in 12 communities in Itu L.G.A. Levels of damages experienced in the communities were categorized into very severe, severe, less severe. This revealed the impacts flood had on the communities. The table below presents the summary of impacts using The Relative Effective Index in each of the communities based on the seven sectors of the communities. These sectors are Business operations, Access to Clean Water, Power Supply, Food Supply, Transportation, Health and Housing.

S/ NO.	COMMUNITY	BUSINESS	DRINKING	POWER	FOOD	TRANSPORT	HEALTH	HOUSING	TOTAL	RANK
		OPERATIONS	WATER	SUPPLY	SUPPLY	ATION				
1.	OduItu	3.96	3.70	3.70	3.65	3.70	3.65	3.70	3.68	5th
2.	Okoho	3.95	3.84	3.63	3.79	3.74	3.74	3.68	3.77	2nd
3.	EdemInyang	3.88	3.80	3.76	3.92	3.72	3.96	3.68	3.82	1st
4.	Akpaekpeneton	3.71	3.75	3.67	3.83	3.50	3.67	3.54	3.67	6th *
5.	AfiaIsong	3.79	3.89	3.61	3.82	3.71	3.75	3.68	3.75	3rd
6.	IkotOtu	3.85	3.78	3.59	3.81	3.63	3.74	3.70	3.73	4th
7.	Etehen tem	3.67	3.81	3.52	3.71	3.57	3.67	3.62	3.65	9th
8.	MkpanUruk	3.72	3.56	3.33	3.67	3.28	3.83	3.50	3.56	12th
9.	MbenInyang	3.87	3.67	3.60	3.67	3.33	3.80	3.47	3.63	10th
10.	Mbiabo	3.66	3.71	3.57	3.74	3.66	3.69	3.63	3.67	7th*
11.	IkotAdakpan	3.66	3.74	3.61	3.70	3.59	3.68	3.64	3.66	8th
12.	Ayadehe	3.65	3.62	3.58	3.64	3.59	3.66	3.60	3.62	11th
Total		3.76	3.74	3.60	3.75	3.59	3.74	3.62		
Rank		1st	3rd *	6th	2nd	7th	4th *	5th		

**Table 2: Impacts of Flood in Human Settlements**

Source: Authors (2021)

All the index scores for each sector in the 12 communities exceed the Relative Effective Index mean value of 2.5. The impact on Business operation came first with an index score of 3.76. This was followed by impact on food supply with 3.75. Impact on access to clean water, and health came 3rd and 4th with an impact value of 3.74. Impact on Housing and power supply came at the 5th and 6th spots with impact value of 3.62 and 3.60 respectively, while impact on transportation came at the 7th spot with an index value of 3.59. The level of damages caused by the flood disaster in human settlements is severe. All sectors are affected directly and indirectly.

### **Assessment of the Psychosocial Impacts of Flood Disaster**

To thoroughly examine the psychosocial impact of flood in the study area, Severity of flood damages, the exposure to stress during and after the flood, the exposure to grief and anxiety during and after the flood event, and the duration of grief after the flood event is considered. The extent of severity is categorized into not severe, less severe, severe and very severe as presented in table 3.

**Table 3: Severity of Flood**

Communities	Not Severe	Less Severe	Severe	Very Severe	No of Respondents	REI	Ranking
Odu Itu	1	1	2	16	20	3.65	6TH
Okoho	1	1	1	16	19	3.69	4TH
Edem Inyang	-	1	1	23	25	3.88	1ST
Akpaekpeneton	1	2	3	18	24	3.59	8TH
Afia Isong	-	1	2	25	28	3.86	2ND
Ikot Out	-	1	4	22	27	3.77	3RD
Etehenzem	1	1	2	17	21	3.66	5TH
Mkpan Uruk	1	2	1	14	18	3.56	9TH
Mben Inyang	1	1	1	12	15	3.60	7TH
Mbiaso	2	3	5	25	35	3.51	11TH
Ikot Adakpan	4	5	4	31	44	3.40	12TH
Ayadehe	6	6	13	73	98	3.56	10TH
<b>Total</b>	<b>18</b>	<b>25</b>	<b>39</b>	<b>292</b>	<b>374</b>		

Source: Author (2021)

The severity of flood occurrences reflects the probability of such a flood becoming a disaster. From the table, the level of severity resulting from flood differed from one settlement to another.

All the settlements recorded a very high severity level as their index score is higher than the 2.5 mean value of the Relative Effective Index, and psychosocial impact in such occurrence is inevitable. This information is illustrated in figure 2.

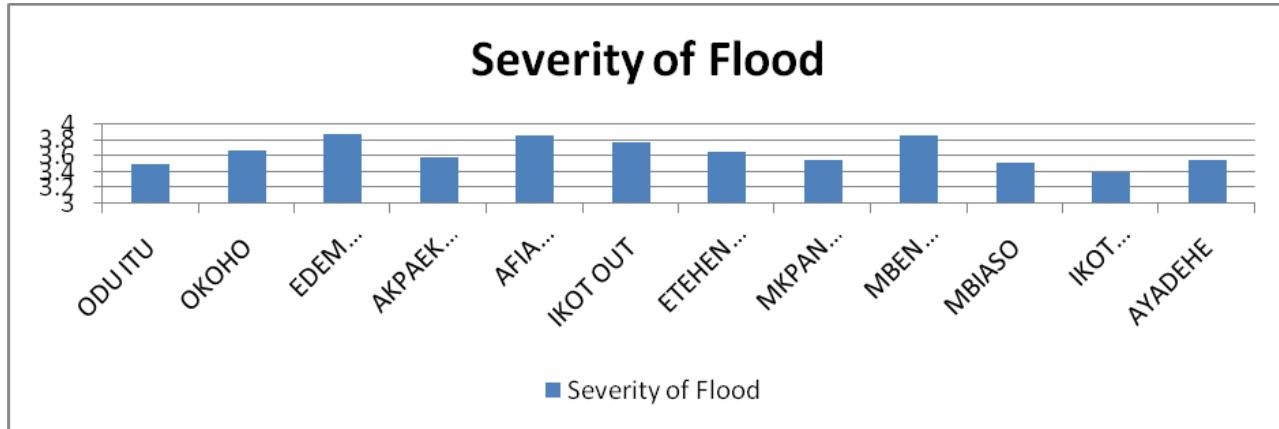


Figure 2: Severity of Flood in the settlements Investigated.

Source: Field Research (2021)

### Exposure to Stress, Grief and Anxiety During and After the Flood Event

The exposure of the people to stress, grief and anxiety during, and after flood event was used to assess the psychosocial impacts of flood in the settlements. The table below reveals the level of exposure to stress, grief and anxiety experienced from flood event by the people in the various communities investigated.

Table 4: Exposure to Stress, Grief and Anxiety

Psychosocial Factors	Not Severe	Less Severe	Severe	Very Severe	No of Respondents
Exposure to Stress	10 (2.7%)	32 (.6%)	68 (18.2%)	264 (70.5%)	374 (100)
Exposure to Grief/Anxiety	30 (8%)	55 (14.7%)	93 (24.9%)	196 (52.4%)	374 (100)

Source: Field Research (2021)

From the table, over 50 % of the respondents observed that exposure to stress, grief and anxiety during and after flood was very severe. Given the high level of damages which affects all sectors

of the human settlements studied, stress level is high as people struggle to prevent damages and in some cases escape as buildings and other facets of the communities are destroyed. However, various people experience different severity level of grief and anxiety due to the level of damages experienced or witnessed.

### **Duration of Grief and Anxiety after the Flood Event**

It is the period of grief and anxiety that transcends to fear, trauma, depression and post traumatic stress disorder (PTSD). Various psychosocial consequences are experienced during flood, however, the level of exposure to the flood, the level of preparedness, and the psychological disposition of an individual plays a vital role on the extent of the impact after the flood event. The table below shows the duration of grief during and after the flood event by individuals in the communities investigated.

**Table 5: Duration of Grief/Anxiety**

<b>Duration</b>					
<b>Communities</b>	<b>1 week after flood</b>	<b>2 weeks after flood</b>	<b>3 weeks–1 month after flood</b>	<b>More than Two month after flood</b>	<b>No. of Respondents</b>
Odu Itu	4	6	5	5	20
Okoho	1	4	6	8	19
Edem Inyang	3	5	11	6	25
Akpaeikpeneton	1	7	9	7	24
Afia Isong	2	6	11	9	28
Ikot Out	3	6	10	8	27
Etehentem	2	4	7	8	21
Mkpan Uruk	2	1	8	7	18
Mben Inyang	1	2	4	8	15
Mbiaso	4	8	10	13	35
Ikot Adakpan	4	8	13	19	44
Ayadehe	8	21	37	32	98
<b>TOTAL</b>	<b>35 (9.4%)</b>	<b>78 (20.9%)</b>	<b>131 (35%)</b>	<b>130 (34.7%)</b>	<b>374</b>

Source: Field Work (2021)

Evidently, 34.7% of the respondents agreed that the duration of grief/anxiety last beyond two months after flood event. However 35% observed the duration of grief and anxiety last between

3 weeks to one month while 20.9% were of the opinion that it does not last beyond 2 weeks after the flood event. The remaining 9.4% only experience grief/anxiety during the flood, and at most one week after the event.

### **Assessment of Management Strategies for Psychosocial Impacts of Disaster**

The management of psychosocial consequences of any disaster is gradually gaining acceptance globally and Nigeria needs to key adopt the culture. It is evident that the occurrence of any disaster potentially comes with psychosocial consequences. Management strategies for psychosocial impacts include:

*Incorporation of psychosocial aid workers in National and State Emergency Response Agencies-* This involves employing psychosocial aids workers as part of regular staff and first responders to disaster events. Identifying the impact exposure level and the behavioural pattern of an individual at the earliest stage during or immediately after flood event is very vital. These determine the quality of attention an individual will require in order not to degenerate to extreme case of psychological breakdown which will inevitably affect his social and physical disposition. Individual's recovery rate from such consequences is also influenced greatly by the help of psychosocial aids available (WHO, 1992; Mason, et al 2017).

*Provision of Recreational Facilities-* Recreation globally plays a vital part in recuperation from various challenges. Development and maintenance of secured park environment for recreation in neighbourhoods have been greatly encouraged in the developed world as affected individuals often recline there to recuperate. These public spaces are highly protected, maintained, and provided with adequate facilities for all classes of the people. In Nigeria however, priority has not been given to parks, open spaces and other recreational centres as a recuperation facility. The few parks available are highly inadequate, plagued with insecurity and dilapidation thereby rendering it unsafe for the public.

*Community-Based Approach -*Development of community-based systems such as social groups, religious association and other socio-cultural activities have been found to be very useful in Nigeria and many parts of Africa. Though mostly unprofessional in nature, these groups are involved in counseling, visitation and sometimes provision of physical and medical aids and (or) trado-medical needs to the affected members and individuals in the society. In some societies, youth, women and men organizations do organize programmes aimed at alleviating the physical, mental and social burdens of the affected individuals.

*Timely Response by Emergency Agencies-*Some psychosocial impacts are triggered by delayed emergency response. For instance, delayed medical attention can result in permanent disability, complicated health condition and even death. Furthermore, delayed sessions with a grieving

victim can get complicated, leading to PTSD. Therefore timely emergency response is vital in abating and managing psychosocial consequences of flood.

## 8.0 Recommendation

Development of Flood Risk Management Plan should be urgently considered and implemented at the federal, state and local government levels to boost the preparedness and resilience of the people. Employment, integration and deployment of psychosocial aids workers and other professionals by both federal and state emergency management agency should be effected. Training of town planners at Area Planning Authorities on disaster emergency response will be very effective in community enlightenment programmes, data collection and planning by emergency management agencies.

## 9.0 Conclusion

Flood events come with psychosocial consequences, and mitigation of flood impacts can require more than financial and medical attention, especially were the impacts are intangible in nature. All sectors of human settlements are affected by flood events from the research and psychosocial impacts are rooted in stress, grief and anxiety which inevitably result in depression and post traumatic stress disorder if not properly handled. These were observed in the communities studied. This therefore calls for the urgent response towards mitigating these impacts given the increased rate of flood events and other disasters in the country.

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# Planning Public Spaces for the Internally Displaced Persons (IDPs) in Makurdi, Benue State, Nigeria

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### Abstract

*Crises—and violent conflicts—induced rural–urban migration is now a major factor in the rapid urban growth occurring in many African cities. Consequently, large numbers of Internally Displaced Persons (IDPs) are present in many cities. The situation of these forced migrants has become dire in terms of returning home. Available statistics suggest that, it takes on the average a return period of 17–20 years before IDPs to return to their places of origin. This implies that city planners have to find alternative solutions in the intermediate term that allows IDPs to integrate faster into their host communities. Against this background, a genre of urban space called public space, specifically parks; squares, gardens and streets have been touted to play a key role in place attachment, social integration, community cohesion, sense of belonging and increased perception of the individuals' rights to the city. This study interrogates how public spaces in Makurdi, Nigeria have catered for IDPs. Focus group discussions were held with the IDPs. Also, observation of places of agglomeration in the host communities*



*was carried out and 400 copies of questionnaires were administered to users of places of relaxation in host communities surrounding the IDP camps. The study discovered that generally residents recreate in hybrid spaces of restaurants and eateries more than in traditional parks and gardens. The paper therefore recommends among other things the integration of hybrid of spaces of recreation into city design and planning with unhindered access for the IDPs.*

**Keywords:** Inclusion; Internally Displaced Persons; Integration; Public Space; Urban design

## 1. Introduction

As of end of 2019, there were over 79.5 million forcibly displaced people in the world, including about 45.7 million Internally Displaced Persons (IDPs) displaced by conflict (UNCHR, 2020). Nigeria in particular, had 2.73 million conflict-and violence-induced IDPs as of 31 December 2020 (Internal Displacement Monitoring Centre [IDMC], 2021). Indeed, violent conflicts and the attendant displacement of persons and interrupted livelihood activities have become increasingly common phenomena on the continent. This exacerbates challenges already facing rapidly urbanising societies and growing cities, particularly in the global South (Duisjens, 2010). Consequently, cities that house the majority of forced urban migrants are already under severe strain.

The 1951 UNHCR Convention protected displaced persons' right to work, freedom of movement, and opportunities for property ownership in their host country. In reality, many host countries decline forced migrants these opportunities (Reed, Ludwig, & Braslow, 2016). Sadly, most urban authorities respond to IDPs by eviction, displacement, formalisation and regularisation (Depraetere & Oosterlynck, 2017; Nordling, Sager, Söderman, 2017). Hence, IDPs constantly face social, economic and racial discrimination often times resulting in tensions between them and host communities. Not much is known about how urban IDPs navigate their way within the urban environment, especially how they are integrated into surrounding communities and the peculiar problems they face as compared with other urban poor. Thus, the discourse of inclusion of IDPs into host communities is rife with a narrative of exclusion.

Meanwhile, public spaces play a great role as a catalyst for social change and inclusion; they are spaces for among other activities coexistence and impersonal encounters (Abbasian, 2016). Most significant is, the potential these spaces have to integrate marginalised and vulnerable segments of society (Jacobs, 1961; Whyte, 1981; Witten, Exeter, & Field, 2003). Studies demonstrate that additional factors such as location, age, gender, income, marital status, education, social class

and occupation have been shown to affect attachment to public spaces (Bonaiuto, Fornara & Bonnes, 2002; Pretty, Chipuer & Bramston, 2003). Regardless of these factors, access to public space remains a major factor in determining if citizens cultivate a sense of belonging in cities from their use.

The idea that public spaces in cities aid the expression of human rights and foster development is an emerging thinking which has propelled the inclusion of the spaces in the sustainable development goals (Mngutyo & Alaci, 2020). There exists a large body of literature, especially on integration and inclusion potential of the spaces besides links to development (Jacobs, 1961; Whyte, 1981; Nemeth, 2009); but the emphasis has been at the international level, with far less information about cities of the Global South. In addition, the opportunities and constraints facing internally displaced persons in actualising their rights to the city remain underexplored in literature.

Rising security challenges characterise many post-colonial African cities; crises, conflicts, highly volatile hot spots as well as political instability, religious, social, racial and ethnic strife are commonalities in such cities (Achebe 2009; Araoye 2012). In Nigeria, security challenges have escalated since religious terrorism occasioned by the emergence of Boko Haram in northern Nigeria began (Onuoha 2014; Thurston 2017; Abdulbarkindo & Alupsen 2017). In the fertile plains along the banks of rivers Niger and Benue, disputes over land for grazing and farming have escalated into violence in several towns in Nigeria's North Central Region also known as the middle belt. These violent crises, has forced thousands to flee their homes. In Benue state, for instance, inter-communal violence resulting from disputes over land for grazing and farming has been on, for many years, but the situation has worsened in the past two years with more than 20,000 IDPs living in camps on the outskirts of the capital city, Makurdi (Duru, 2021).

Therefore, planners as managers of cities should prioritise interim solutions for IDPs which allow them to integrate faster into their host communities. On this basis, this study interrogates the engagement of public space by internally displaced persons in Makurdi. The specific focus of this study include a description of public spaces in within the vicinity of the IDP camps, an examination of IDP engagement with public spaces and an interrogation of responses from the host communities as well as a discussion of implications for planning and policy.

## **2. Study Area**

Makurdi, the capital of Benue state, Nigeria, is a multicultural city with a high presence of IDPs and immigrants as well as different types of public spaces. The town is located between latitudes 7°04'1" and 7°04'7" North and longitudes 8°02'9" and 8°03'6" East within Makurdi Local Government Area (LGA) which covers an area of 804.2 square kilometres (16-kilometre radius). Figure 1 shows the location of Benue State within the context of Nigeria while Figure 2 shows

the location of Makurdi within the context of Benue State. Makurdi LGA had a population of 300,377 (National Population Commission [NPC], 2007) as of the last census exercise, it was projected to 426,536 in 2020.

In Makurdi LGA alone, there were ten (10) different camps for IDPs in 2016. Available records for the years 2014–2016 show that there were 542 households with a population of 4804 persons sharing 12 blocks of classrooms, meant to accommodate at most 50 pupils per class (Benue state Emergency Management Agency, Report on the 2014 Internally Displaced Persons From the Crisis between Cattle Herdsmen and Farmers in Benue State 2014, Volume I and II).

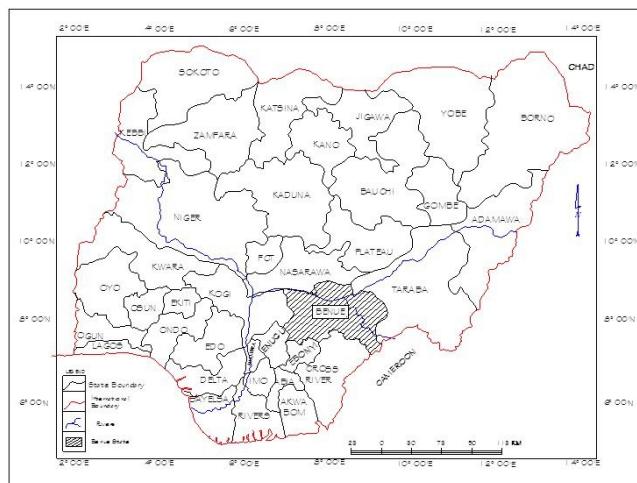


Figure 1: Benue State within Nigeria

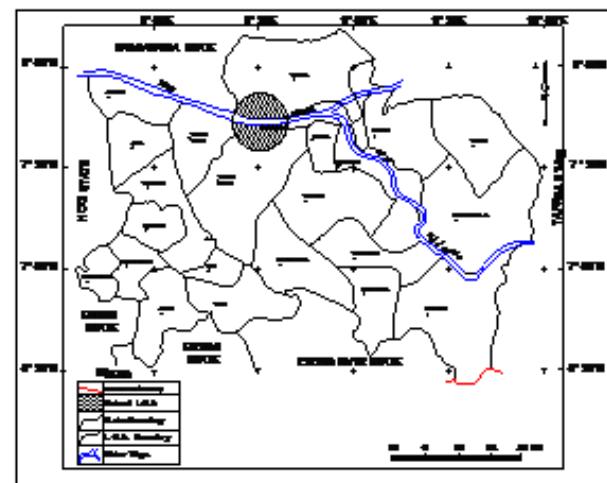


Figure 2: Makurdi Local Government Area (LGA) within Benue State

Source: Ministry of Lands and Survey, Makurdi, 2018

### 3. Methodology

Preliminary survey of Makurdi town highlighted areas used for recreation in Agan, Mbalagh, Northbank I and II wards in Makurdi with large IDPs populations. Coordinates of the areas identified were picked using a handheld Magellan SporTrak GPS and transferred to a map. Focused Group Discussion (FGD) was carried out at the refugee camps leading to the development of the study variables. The FGD discussion was with different homogenous groups selected from residents of Abagena IDP camp made up of three age cohorts including: elderly men and women aged above 60 years ( $n=10$ ); middle aged married men and women <60 years and  $>30$  ( $n=18$ ) and young males and females aged  $<30$  years ( $n=16$ ) were conducted in the camp on the outskirts of Makurdi.

Conventionally, parks are so called because of their primary function as areas for recreation (Mngutyo and Ajene 2018). This paper however relies on a wider diversity and typology of

places used for recreation described by Azare, Dantata, Musa & Duala (2018) as hybrid spaces. They include street joints, bars, restaurants, empty plots, under trees, on street corners, sport fields and community spaces in which people gather for recreation. These spaces are used in this study because there is a conspicuous dearth of parks, in the traditional sense. Therefore, all the spaces used for active and passive recreation which attract a crowd of more than 10 people were used as public parks. The Taro Yamane formula was applied to the population figure determined earlier to arrive at a sample figure of 400 respondents.

In Nigeria, neighbourhood parks or recreation areas are second-order recreation areas originally designed to serve people living within 0.4–to 0.8-kilometre radius of the park (Obateru 2003). This study adopts the upper limit of 0.8km for convenience and uniformity. Consequently, 2 km<sup>2</sup> around parks was determined as park neighbourhood threshold. These neighbourhood parks were then used as spatial units for data collection. This radius was used rather than using the neighbourhood area boundaries. This is because of the lack of well-defined boundaries between neighbourhoods common to most Nigerian and African cities (Alaci & Chup 2015).

Sampling of the 400 respondents within public spaces was purposively randomly done. Park neighbourhoods and recreation spaces were visited for seven consecutive days within which every 5th park user and 5th household was administered with questionnaires. Parks were visited during business hours in the morning, afternoon and evening period stipulated by time slots of 8 am–12noon, 12 pm–4 pm and 4pm–9 pm. A combination of descriptive and inferential statistics such as T-test, an analysis of variance, was used. Further analysis consisted of an iterative process comprising three different phases. Data exploring the experience of IDPs highlighting good, bad or neutral practices was captured. Using a process of thematic analysis described by Braun & Clarke (2006), recurring patterns or themes, which described the nature of the experience more specifically, were identified. Among the themes identified was the relationship between public space access and recreation, as discussed in this paper.

#### **4. The relationship between public space access and recreation.**

##### **4.1 Classification of Public Spaces used for Recreation by IDPs.**

The key elements of such spaces that was evaluated in this study include; location, character, size, activities carried out therein findings in Table 1 show a total of 21 areas identified for recreation in Makurdi by respondents out of which 11(52%) are located in North bank I and II wards. The other recreation areas were located in the Southbank of Makurdi and considered to be too far away from IDPs to be used by them since proximity is an important variable in park utilisation (Giles-Corti & Donovan, 2003). The recreation spaces had an average area of 26,798m<sup>2</sup> and were characterised as mainly restaurants and hotels (45.5%). And the average distance between the spaces and the IDP camp was 4 kilometres.

Table 1: Location and Area of Public spaces in Makurdi

S/n	Park Name	Neighbourhood /character	Freq.	%	Coordinates (East/Northing)	Area (m2)	Activities
1	Villa mart	North bank	44	11	451092, 856555	2,225.9	Bar, restaurant, car park
2	Suya Spot ct 5 Junction	North bank	32	8.0	450992, 856619	2170.5	Suya stand, mechanic shop, provision shop, shoe maker
3	City bay	Low-level	52	13	449230, 854037	19707.6	Event center,bar, children halls, play grounds
4	MJ resort	International market	32	8.0	450511, 850874	3025.5	Swimming pool, bar, restaurant, event centre
5	BIPC Hotel	North bank	28	4.0	451025, 856527	4,759.4	Hotel accommodation, events hall, swimming pool, restaurant ,bar
6	SRS Junction Joint Bar	North bank	20	5.0	451261, 857631	33,372	Fuel filling station,motor parks,shops
7	Photo Studio		16	4.0			Taking pictures
8	Golf Course	North bank	20	5.0	451692, 855913	243,136.5	Golf course
9	Okiki Hotel	North bank	4	1.0	451818,860547	11,996	Lodging, restaurant, bar, swimming pool, event hall
10	Lafia Garage park	North bank	8	2.0	451443, 858704	16,572	Mechanic workshops, petty trading, motor park

11	Virtual Lodge	Northbank	8	2.0	454926, 858526	5,106	Bar, restaurant, swimming pool, event centre
12	Ejah Suite	Fiidi	16	4.0	453729, 853723	1,788	Bar, restaurant
	White						
13	House Hotel	Northbank	4	1.0	451780, 860181	7,380	Lodging, bar
					444992, 852297		
14	Bush Bar	Naka Road	12	3.0		1,216.5	Bar, restaurant, suya spot
					445032, 852341		
15	Ruth-May Lodge	North bank	8	2.0	450736, 856724	561	Lodging, bar
16	Exodus Cinema	Wurukum	4	2.0	450188, 853838	8,434	Cinema
17	Aper Aku Stadium	Wadata	12	3.0	447375, 854688	111,985.3	Sporting activities
18	District 4	Old GRA	12	3.0	448567, 854756	795.5	Club house,bar
19	IBB Square	High level	12	3.0	447868, 852979	130,275.1	Public gatherings
20	Church		28	7.0			
21	Tito gate	Clerks Ward	12	3.0	448889, 854073	1,605.8	Restaurant
22	Heavy Duty Park	North bank	12	3.0	451758, 860002	873	Shops, motor park
23	Total		342				

**Source: Ministry of Lands and Survey, 2020**

The presence of these spaces for recreation does not presuppose that they are used for recreation. Subsequent sections highlight the activities that attract visitors to areas of recreation.

#### 4.2 Active Recreational Activities

Activities carried out in public spaces are a strong attractive force showing how the spaces are used. Findings in table 2 show that major activities people in the host communities around the IDP camps engage in at the spaces are eating and drinking, drinking, dancing, holding of community and association meetings as well as gisting (talking and socialising with friends). On the average (42.8%) of respondents engage in eating and drinking for recreation, while 47% visit places of recreation for drinking and 31% use spaces for recreation as places where meetings can be held.

Table 2: Activities carried out within Recreation areas

Activities	Frequency	Percent	Cumulative Percent
Eating and drinking	171	36.0	36.0
Drink and dance	188	17.0	53.0
Hold meetings	124	31.0	84.0
Gist and rest	64	16.0	100.0
Total	400	100.0	

**Source: Authors' Field Survey, 2020**

These activities do not deviate from findings of studies as major activities carried out in public space. What is glaringly contrary with what is in literature is the conspicuous absence of activities for young children. Activities for children should be included in spaces planned for recreation in Makurdi most especially IDPs.

#### 4.3 IDP Engagement with the Public Spaces of Makurdi

Inclusiveness in urban areas as well as expression of rights to the city has been shown in literature to be greatly enhanced by engagement with public space. IDPs who assented to all five of the variables identified were considered to have a high engagement with public space while those assenting to three to two variables were judged to have average engagement while those with agreement to less than two variables were considered to have few opportunities to engage with public space. The results are illustrated in the Figure 3

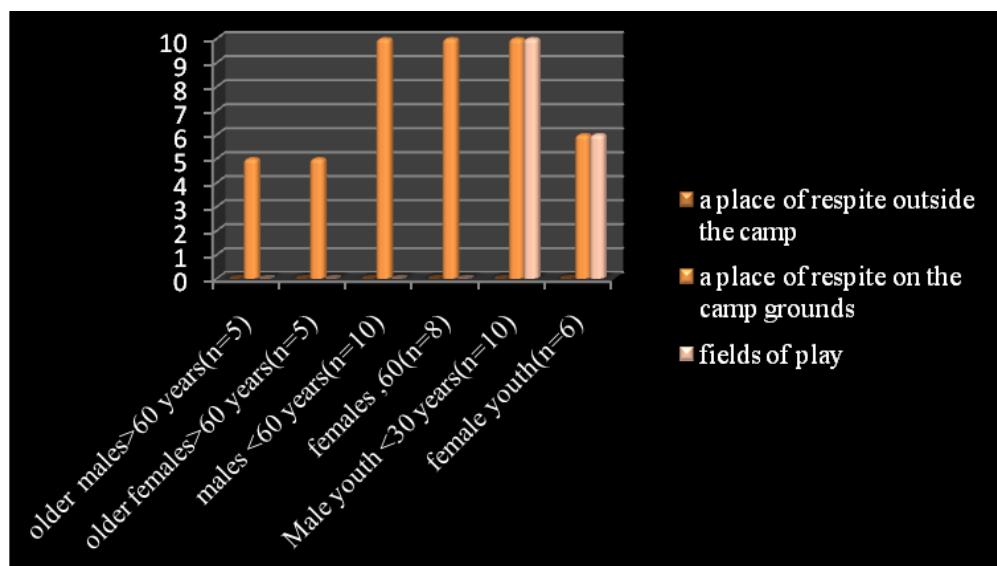


Figure 3: Opportunities of Public Space as a Place of Respite for IDPs (n=44)  
Source: Authors' Field Survey, 2020

Responses from the IDPs showed that the only space for respite from their daily toil for survival is a spot under the tree in front of the camp where they gather for playing of cards, gambling and “daar”; (a local Male-based game) The married female respondents (n=8) indicated that they had a field outside the camp designated as a football field where their children went to play which was accessible to the children at all times. The women recreate by engaging in church activities and talking among themselves. The young men and women aged under 30 years (n=16) also had access to the football field as the second option for active recreation. None of the respondents had any engagement with places for recreation outside the campground in the host communities.

The reasons IDPs do not engage with places of recreation outside the camps as also examined. The majority of participants (100%) identified lack of finances as the most significant reason they did not engage with public spaces outside the camps. This view is expressed by some of the respondents

“We are needy and we don’t have any money to go out and relax ourselves. Imagine going out to a place of relaxation and seeing your mates’ spending money to enjoy and you don’t have anything on you. You will feel ashamed of yourself”

*Young Female FGD discussant, Abagena IDP camp Agan council ward.*

During festive seasons and as a means of relaxation some of the respondents especially the females mention the church as a place of respite. One young lady noted as:

“In my own place, our enjoyment comes from the church. Before Christmas day, we practise dances in order to entertain people in church. That way we derive our enjoyment. We are not comfortable here and for this reason we cannot enjoy ourselves”

*Young Female FGD discussant, Abagena IDP camp Agan council ward.*

Findings from a study in the rural areas of Benue State (Sugh, Mngutyo and Ugbem-Onah 2020) clearly reveal that, there are little or no leisure activities or facilities for rural women in the study area. This is in tandem with this as IDPs do not go out of their camp to find a breather rather a tree within the environs of the camp is where majority of the IDPs find respite from daily toil. The IDPs’ children also have a field adjacent the camp provided by the government where they engage in active recreation.

#### 4.4 Public Space as a Place of Socialisation and Connection for IDPs

IDPs initially, on arrival at the camps develop social relationships with members of the host communities but this has gradually dwindled over time. The main reason was because the relationship was not mutually beneficial. The host community members viewed the IDPs as benefitting from the aids government and other organisations bring without including them. These views are expressed below:

“I have never seen people so terrible like the people in this place before. We did our utmost to make friends with the host community but we couldn’t. They are not friendly at all. We even pleaded with some to take us along to their farms, so we could help them work on their farms but they turned us down”

*Young Male FGD discussant, Abagena IDP camp Agan council ward.*

“We have been able to make friends among ourselves. We also made friends with persons from the host community but such friendship does not last long because we are needy as a result of our idleness and we always don’t have anything to offer our new friends .They always want us to reciprocate their good deeds to us and when we are unable to, the friendship becomes extinguished;”

*Older Male (>60 years old) FGD discussant, Abagena IDP camp Agan council ward.*

A number of explanations exist for this lack of sustained socialisation and connection between IDPs and host communities. In the first instance, the basic needs of the IDPs like water and food are provided within the camp, thus reducing incidences for mingling with host communities. The only basic need that takes IDPs out of the camp is the need for firewood used in cooking and the need to charge phones (handset) because of the absence of electricity. Other opportunities to foster connection with host community come in the form of menial labour on the farms. But this is usually relegated to the younger IDPs and is paid very meagrely as explained by young male discussant:-

“The money we get from our labour is always very meagre. Most of us sitting here are married people. At times, the money we earn from all our labour is just a thousand naira. Which businesses can one start with that small amount of money? The money we get is always not enough to do anything else but feed in order to survive”

*Young Male (<30 years old) FGD discussant, Abagena IDP camp Agan council ward.*

Consequently, there are very few opportunities for socialisation for the IDPs this will negatively

affect their assimilation and inclusion into the societies of surrounding communities. This factor also negatively impacts on how the host community perceives and so relates with the IDPs.

#### **4.5 Uncertainty, Aggression and the Anxieties from host communities against IDPs**

The ability of the IDPs to take part in communal life of the host community shows how they are integrated into such society. The older men and women reported that they had no issues with members of the host communities. On the other hand the younger ladies and men as well as the middle aged men and women reveal that they have clashed with members of host communities but such brawls are usually amicably resolved. The question of how the host community perceives the IDPs was put to the IDPs in a FGD and the following reflects their views on the host community's acceptance of them:

“We the elderly ones don’t normally have issues that are peculiar to us as women because we don’t leave this place but our daughters have encountered issues that are peculiar to them as ladies because they move about”

*Older female (>60 years old) FGD discussant, Abagena IDP camp Agan council ward.*

“We were almost beaten up by persons from the host community when Red Cross brought some aids for us. The police were the ones that came to quell the ensuing crises. They have beaten us here in the camp because we are living in their place.

*Young Male (>30 years old) FGD discussant, Abagena IDP camp Agan council ward.*

Aggravated treatment of IDPs by host communities will limit their ability to integrate into the host communities and also limit their ability to improve their standard of living .It also shows the perception of the host community of IDPs as imposters.

#### **4.6 Aggression Against women**

In Africa in particular, gender, and generation distributions play a role in the organisation of homes so that women are primary caregivers who provide food and other activates that keep the home.In the camps these roles place the women at risk especially from hostile host communities. Findings from discussions agree with other studies that state that women in camps are often very vulnerable.

“Sometime in the past, our daughters were on their way to the forest to fetch firewood. They were accosted on their way by some men who seized their axes and cutlasses. The men demanded that our daughters have sex with them before they can return the items back. Our daughters

refused and the implements were not returned. Our daughters managed to escape and came to report the case to the elders who engaged the local vigilante and the axes and cutlasses were later returned” *Middle aged female (<60 >30 years old) FGD discussant, Abagena IDP camp Agan council ward.*

“We have had many issues with persons from the host community in the past. They have beaten our men before. Our women were also beaten when they went to fetch firewood and the firewood was seized from them as well. When the governor visited us with some items for Christmas, they came here and took one of the pigs he brought for us by force. They treat us with so much disdain because they feel we ought to share the donations given to us with them because we are inhabitants of their land. We have been able to live in harmony with them only recently since we started sharing the donations brought to us by humanitarian bodies like Red Cross, UNICEF etc. with them

*Middle aged Male (<60 >30 years old) FGD discussant, Abagena IDP camp Agan council ward.*

#### **4.7 Opportunities for Improved livelihoods from host communities by IDPs**

Public spaces such as streets provide arena for economic activities which are a source of livelihood for majority of urban dwellers in African countries. Accordingly, how IDPs provide an income from public space is also evaluated the question income generation avenues in public space was put to the IDPS findings from the discussions are presented below:

“No we don’t have any other means of making money apart from carrying out menial jobs for people. We cannot farm here because we don’t have farmlands. We cannot collect farmlands on lease because we don’t have money to pay for the farmlands

*Middle aged Male (<60>30 years old) FGD discussant, Abagena IDP camp Agan council ward.*

“We buy and sell things like pepper from the income we make from the menial jobs for people”

*Older female (>60 years old), FGD discussant, Abagena IDP camp Agan council ward.*

When asked if there are opportunities for them to trade in the neighbouring markets like those located in surrounding neighbourhoods like North Bank, Yagba and Daudu where there are daily and five-day cycle markets the discussants had the following explanations:

“we attempted to sell outside this place, in places like Yagba, Daudu and North bank but the expenses involved in starting a business in such places were too much for us. In one place, we were told to bring ten (10) thousand naira. In another, we were to buy drinks and other things

before we could get a space to sell. That's the reason why we only sell in this place”

*Older female (>60 years old), FGD discussant, Abagena IDP camp Agan council ward.*

Opportunities for improved livelihoods are a unique area for integration into society. Findings have shown that chances to make a living open to IDPs are limited to the camps thereby reducing the sphere of engagement with host communities and further limiting inclusion for IDPs.

#### 4.8 Relationships between host communities with IDPs

According to literature interdependencies often exist between officially camp-settled, illegally self-settled persons outside camps and host communities (Lubkemann, Minear, & Weiss, 2000). However the quality of the relationships is evaluated in this study, questionnaires were administered to host communities surrounding the camps and relationships were rated in five categories of very cordial, cordial, average, somewhat hostile and hostile, respondents were requested to choose one option in describing the relationship of the host communities with the IDPs. The responses from the respondents are presented in Figure 4.

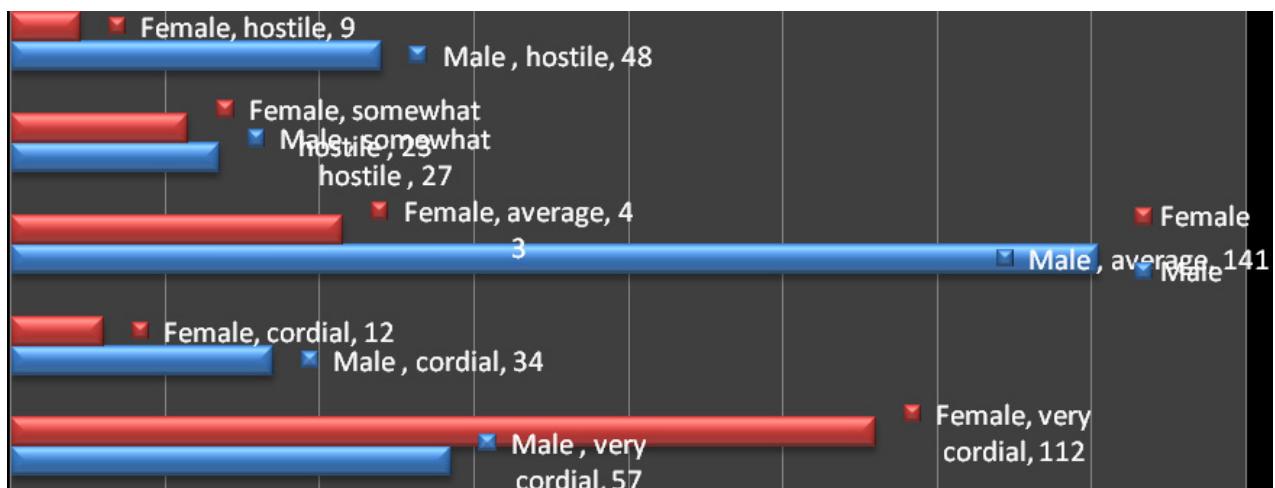


Figure 4: Respondents views on the quality of relationship between host communities and IDPs

Source: Authors' Field Survey, 2020

Respondents especially the male view the relationship as host communities with the IDPs as average (91%) while the females view the relationship as very cordial (112%). Disparities between the gender could be explained by the fact that in the closed traditional societies women generally play background roles which reduce the forums for interaction that could be used to define relationships. Of significance also is the large of male respondents who view the relationship with IDPs as hostile (48%), this collaborates earlier findings from focused group discussion with the IDPs who also describe the relations with host communities as hostile. The Figure 5 shows

findings on reasons adduced by respondents on the quality of relationship between IDPs and host communities as described by members of the host community. Five different statements were made based on studies which state that host communities often view IDPs as competing with them for scarce resources, criminal and illegitimate and so not worthy of partaking in the city's common goods (Kälin & Schrepfer 2012; Refugee Law Project 2005; Risbeth, Blachnicka-Ciacek & Darling 2019; Crisp et al. 2009). Respondents were asked to pick one statement that best describes the reason for the quality of their relationship with IDPs.

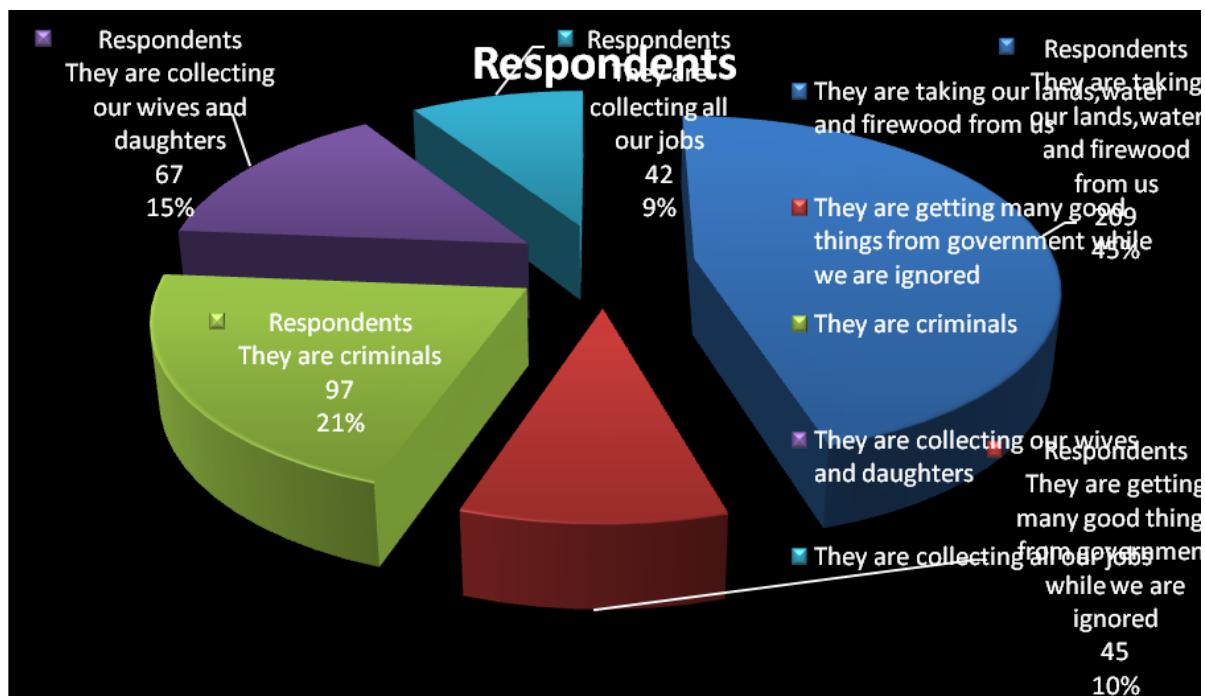


Figure 5: Reasons for the quality of relationship between IDPs and host community

Source: Authors' Field Survey, 2020

According to findings from the survey, the host communities were mainly concerned about the depleting natural resources such as water, firewood and farmland being used by the IDPs (45%) and increased insecurity since the IDPs came on the scene (21%). These concerns especially on the increased claim on natural resources is in line with current literature (Banki, 2004; Risbeth, Blachnicka-Ciacek & Darling 2019). However studies carried out elsewhere show that increased criminality has not been linked to IDP presence (Banki 2004; Lubkemann, Minear, & Weiss 2000) also worrisome is the response of skewed government provision that favours only the IDPs. This finding agrees with (Lubkemann, Minear, & Weiss, 2000) who says if not well managed, Humanitarian action can constitute a "second disaster" if it does not incorporate a fairly refined understanding of local coping capacities and strategies.

## 4.9 Urban Planning Implications

Urban public facilities such as parks ,streets and gardens support social inclusion(arch2o.com 2012–2020).Social inclusion has been shown to be at various levels in diverse situations and settings (Banki 2004) depending on individuals or a group's inability to participate in economic, social and political aspects of life because of imposed constraints rather than by choice (Das and Espinoza, 2019). Social inclusion and appropriate integration, has been seen as a precondition for achieving all-encompassing and sustainable development (Chen, Harvey, Kihato and Skinner, 2018) particularly for vulnerable groups in society among which are IDPs. Consequently, greater recognition of IDP's participative rights in the society of cities should be significant to both urban planners and designers and should result in the design and implementation of more accessible public spaces. It is envisaged that this should improve social inclusion of IDPs and further translate to more sustainable development especially for cities with large IDP populations.

## Conclusion and Recommendations

The study discovered that generally residents of Makurdi recreate in hybrid spaces of restaurants and eateries more than in traditional parks and gardens. Engagement of IDPs within public space is poor on all indicators. The relationship between the host community and IDPs is average but tending towards hostile reasons border on competing demands of natural resources and perception of IDPs and criminals. These finding lend themselves to the following recommendations:

It is important to consider both children,women and men as key user groups when designing public space

1. Planners and city designers should consider the integration of hybrid spaces of recreation in planning for cities rather than sticking to traditional models of parks and gardens for recreation.
2. Activities common to hybrid spaces like eating and drinking which draw people to such spaces should be included in traditional parks to make them more attractive.
3. Public transportation networks in Makurdi should be improved to improve links between the camps and recreation spaces.
4. Public spaces near camps should provide diverse and free activities for recreation and IDP residents should be encouraged to visit recreation spaces.

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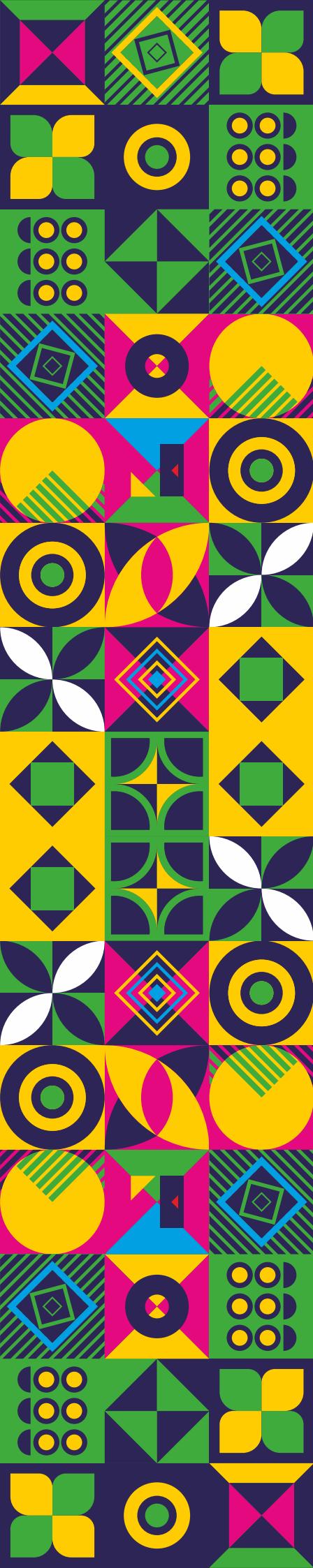
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## SECTION TWO

**Making Nigerian  
Settlements less  
vulnerable; improving  
resilience.**



# Building Resilient Cities In Nigeria Through Coproduction: The Magodo Experience

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### Abstract

*Deterioration of urban centres has remained one of the major challenges of the 21<sup>st</sup> century. However, while urban renewal is a major approach for restoration of cities, urban planning process includes review of plan as a major step to realign the growth of a city with the vision of its proponents and realities of the environment. It was in actualization of this stage of planning process and the development drive of Lagos State that the New Towns Development Authority commissioned the review of Magodo Residential Schemes I and II, which were some of her prime estates. In reviewing the schemes, number 11 of the Sustainable Development Goals—making cities and human settlements inclusive, safe, resilient and sustainable—was prioritized, and the review employed coproduction approach for the delivery of the plan. The result of the plan review showed that ‘transdisciplinarity’, which embodied the process of coproduction, enriched the outcome of the plan. It bolstered the fact that stakeholders’ interests and preferences differed and they were mostly affected by stages in life, economic orientation and socio-ecological conditions of the participants. The paper concludes that planning a resilient city must be inclusive, as well as involve people who have the technical and socio-economic knowledge of the city.*

*Key words:* resilient cities, coproduction, inclusive, transdisciplinarity, Magodo

## 1. Introduction

The United Nations projects that 2.3 billion people will be added to urban areas between 2020 and 2050, with 90 percent of this increase taking place in Asia and Africa (United Nations 2018). The pace of urban growth in Sub-Saharan Africa is projected to be the fastest in the world. This is where there are weak institutional and fiscal capabilities. Urban populations in Sub-Saharan Africa are expected to double from 458 million in 2020 to 1.2 billion in 2050. At the country level, China, India and Nigeria will account for 35 percent of the projected urban population growth. Lagos State has 27.4% of Nigeria population estimate [UN-Habitat] and its urban population, projected to be 35 million in 2020, is expected to double by 2050.

Such population growth, with its multi-dimensional socio-economic implications, drives expansion of built-up areas. Lall, Lebrand & Soppelsa, (2021), in a World Bank report based on satellite data analysis for almost 10,000 cities, establish that the global urban built-up area grew by 30% between 1990 and 2015 through horizontal spread and infill. While 90% of the new buildings in poor countries sprung up at the edges of cities, 35% of developments in rich nations are infill within urban centres. Despite the fact that infill development in Sub-Saharan African urban centres, occurs in older parts of the cities, most preparations to accommodate new entrants are concentrated in creation of new towns (legally and illegally) at the urban periphery to the detriment of the old cities. Monitoring activities in the city centres are limited as a result of inadequate manpower among other factors. However, with about 70% of the world's population expected to live in urban areas by 2050, cities should plan to accommodate all three types of development (horizontal, infill and vertical) or risk facing uncontrolled sprawl, overcrowding and congestion (Lall, Lebrand & Soppelsa, 2021).

In spite of the alarming rates of increasing population and land consumption in Sub-Saharan Africa, the peculiarity of Lagos State (with the smallest land area in Nigeria) calls for proactive and ingenious planning approaches to prepare for the growth. In recent decades, Lagos has experienced significant increase in its population and expansion of its built-up area, and this is projected to continue to rise in the coming decades. These changes come with implications and may pose multiple threats to the populace and the built environment; hence, they are a major concern to urban planners and managers.

Increasing built-up area resulting from population growth often leads to a reduction of available green and developable space in cities and its surroundings thereby causing increased tension in land allocation among different uses and functions, as well as climate change challenges. The resultant effects of this include 'urban sprawl, city food safety, community vulnerability to climate change, coastal erosion, and pollution (air, water, and noise)', among others (Morgado, Abrantes and Gomes, 2018). This, according to Johnson (2013), would have significant negative impacts on global ecosystems and future urban expansion would result in substantial biodiversity

loss (Seto et al., 2012). Unmanaged urban expansion also poses threats to urban infrastructure and facilities, among others.

The goal of urban planning is to allocate resources among competing uses, protect and improve the commonwealth of the people; and it has been established (Thackara, 2006) that approximately 80 per cent of the total environmental impact of the built environment is determined at the design stage. Therefore, it is essential that our planning and design increase resilience in the urban built environment; ensuring this requires that development plans are in tune with the reality which can only be achieved through constant review.

With the increasing awareness of the role of planning, risks posed by the increasing and uncontrolled growth of population and built-up areas, there is need to plan and build resilient cities that are better prepared to ‘absorb change and disturbance while maintaining the same relationships between populations or state variables’ (Holling, 1973). Such cities, according to the International Institute for Sustainable Development, must integrate the qualities of ‘flexibility, redundancy, robustness, resourcefulness, reflectiveness, inclusiveness and integration into all aspects of city functions’. The Rockefeller Foundation (2015) considers those qualities as ‘essential to preventing the breakdown or failure of a system and enabling it to take action in a timely manner’.

Building a resilient city goes beyond planning but also its implementation which includes delivery of the proposed services. However, authors (including Narayan (1993) and Cummings (1997)), have established positive relationships between involvement of beneficiaries in program development and implementation successes. It is considered as critical for achieving sustained benefits. Although there are different but similar methods of involving beneficiaries in planning and project delivery, co-production is favoured in this paper because it is a build-up to a range of similar approaches. This paper therefore focuses on delivering resilient cities using co-production in Nigeria.

## 2 Conceptual and Theoretical Backgrounds

There are plethora definitions of resilience but that of Cumming et al (2005) becomes handy in this context. They define it as ‘the ability of the system to maintain its identity in the face of internal change and external shocks and disturbances’. Resilience embodies good health, a safe environment, social harmony and prosperity. For a city to be resilient, the Rockefeller Foundation (2014) suggests that the city must be able to evolve and adapt in response to changing circumstances (**flexible**); has capacity to accommodate disruption or surges in demand (**redundant**); built to withstand the impacts of hazard events without significant damage or loss of function (**Robust**); be able to accept changes and proffer solution based on emerging evidence rather than status quo (**reflective**); promote consultation and engagement

of communities (**inclusive**), promote mixing within and between its systems (**integration**), and her people and institutions must be able to find different ways to meet their needs when under stress (**resourcefulness**).

Hence, city resilience is a complex phenomenon that is affected by a multiplicity of factors and its planning involves a wide range of stakeholders including civil society, local and national governments, the private sector, various professional communities, and city residents. Like any other planning approach, city resilience planning is a process with a definable beginning, a definable end and requisite intermediate steps. Allan (1972) itemizes the phases as organization, inventory, analysis, forecasting, design, evaluation, and implementation with due considerations for feedback and ‘feedforward’ elements and citizen participation. There have always been advocacies for citizen participation by individuals and international development communities. Arnstein (1969) propounds and orchestrates the ‘ladder of citizen participation’ that shows different levels individuals can be involved in making public decisions that affect their individual and collective interests. Variants of the citizen participation have evolved and it includes Judith Innes’s (1995) Collaborative planning, ‘an interactive process of consensus building and implementation using stakeholder and public involvement’.

Like other theories, collaborative planning has been subjected to many criticisms (Allmendinger and Tewdwr-Jones, 1998; Huxley, 2000; Hillier, 2003; Mouffe, 2005); Sager, 2009); Swyngedouw, 2005; 2010) and Allmendinger and Haughton, 2012). There are concerns that such planning approach may lead to marginalization of interest groups while using ‘public interest’ to justify decisions (Eversole, 2010). Huxley (2000) also identifies susceptibility among others, as weaknesses of collaborative planning.

Despite the criticisms, it remains inevitable that concerned parties must be involved in the planning process. Thus the quest to develop awareness on shaping engagement processes brought ‘co-production’ for value co-creation to fore. Co-production is defined as the involvement or participation of a customer with a firm in the creation of a product (Lengnick-Hall, 1996). Co-production research has shown that the involvement of consumers in services can be a source of gains in productivity (Lovelock and Young 1979; Fitzsimmons 1985). It involves actors making ‘better’ use of each other’s assets and resources (e.g. knowledge, skills, time, money, facilities) to achieve improved outcome Parker, Lynn & Wargent (2015). It is expected to give the service provider an increased confidence to do creative, innovative things to meet local people’s needs.

Co-production, in this context, involves the provision of public services through regular, long-term relationships between state agencies and organised groups of citizens, where both make substantial resource contributions (Joshi and Moore 2004). It involves an equal and reciprocal relationship between professionals and service users (including their families and neighbours).

Where activities are effectively co-produced, both services and neighbourhoods become far more effective agents of change. Bovaird (2007) suggests that this approach can be usefully extended across the full ‘value chain of service planning, design, commissioning, managing, delivering, monitoring and evaluation activities’. Coproduction requires citizen participation in service delivery at the local level. This approach helps to strengthen local participatory democracy. Considering the fact that implementation is usually the bane of planning process justifies co-production in the process. Implementation is usually taken over or left for the bureaucrats and politicians, thereby delivering services which may be different (in specification or in totality) from the plan or totally abandoned. However, it is believed that co-production increases customers’ control over service delivery, thus enhancing experience and outcomes (Bendapudi and Leone 2003).

Co-production builds upon a range of similar approaches such as consultation, engagement and co-design. Consultation, engagement and co-design encourage people to input by asking for their ideas, experience and opinions. Co-production is different because it also needs people’s actions (see figure 1 and 2). Co-design is another word usually mixed up with co-production. Co-design means that the planning of services is done jointly, but this does not always lead to involving people using services, families and communities in the delivery of the service. Similar to the Citizen Participation Ladder, the Coproduction Ladder developed by Think Local Act Personal (TLAP), describes a series of steps towards attaining full co-production. It shows the various stages of inclusion before full co-production is achieved. Running from coercion at the lowest rung through educating, informing, consultation, engagement, co-design to co-production at the peak of the ladder. At the lowest rung of the ladder, services are provided and people are expected to use them without understanding their true needs; towards the middle, the service users are involved to the extent of expressing their views in a variety of ways. The peak of the ladder involves service providers (including consultants) working with the users and other organisations from design to delivery

This inclusive attributes of co-production, which is also one of the qualities of a resilient city, makes it amenable to building resilient city.

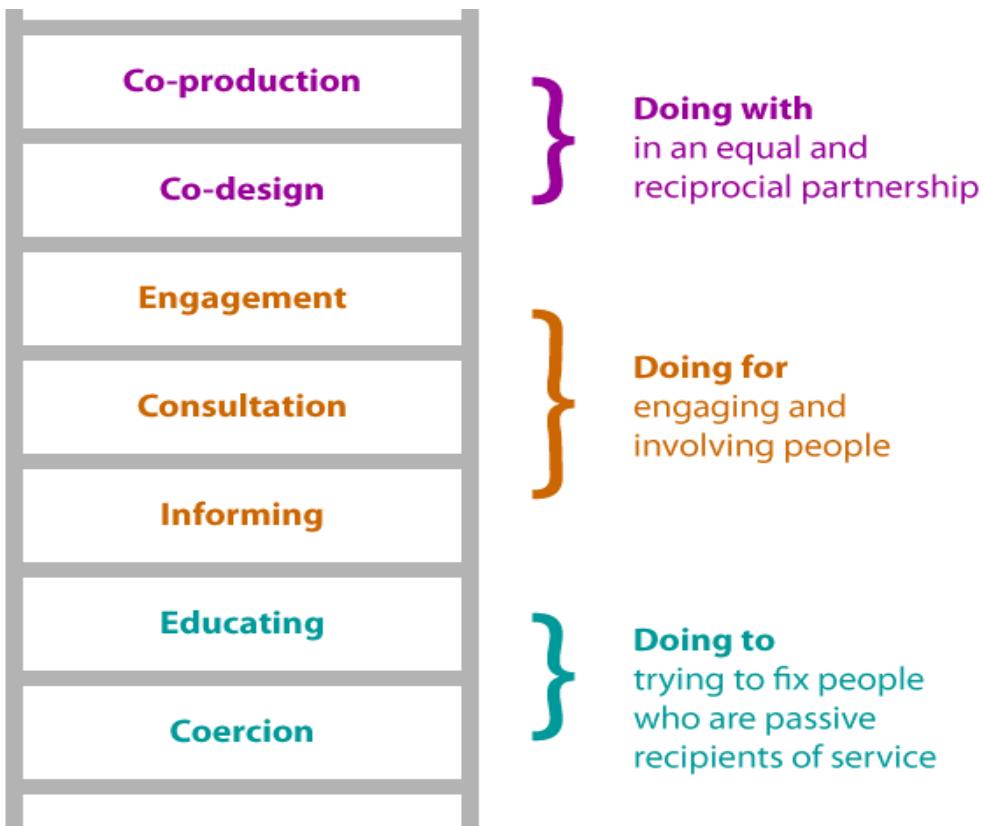


Figure 1: The ladder of co-production

*Source: Think Local Act Personal, 2020.*

## 2.1. Background to the Magodo project

The aim of the Magodo review project was to assess the extent to which the schemes lived up to the expectations of its proponent and prepare a strategic framework for managing its future development for the next ten years (2020–2030). The study, which was funded by Lagos State Government, was undertaken for New Towns Development Authority (NTDA) which was established in 1981 primarily to address physical and infrastructure development in the State. The Authority was established in order to effectively implement the planned growth in the five (5) divisions of Lagos Metropolis, namely: Ikeja, Badagry, Ikorodu, Lagos and Epe with a mission to develop New Towns with functional infrastructure.

The project was initiated by the community members through series of letters to the government and newspaper publications on the deteriorating state of the schemes. It was awarded to a planning consultant by the State Government. The function of New Towns Development Authority was to oversee the delivery of the plans while community leaders and the people were to support the consultants in the process.

To achieve the aim of the review, social scientific research methods, which include surveys, interviews and field observations, were utilised. Primary data were collected via the administration of structured questionnaire to residents, interview of selected people including urban practitioners, and stakeholders' consultations. Secondary data were obtained from textbooks and government published documents, while the existing patterns of development were deduced from acquired imagery of the sites. Fundamental Town Planning Principles were given considerations while working within the vision of Lagos megacity transformation and policy position of the client. The review process prioritized consultation with stakeholders which include Residents Association and professionals. This was held in form of consultation meeting with the in-house technical team, professionals, relevant parastatals and organization of stakeholders' fora.

## 2.2 Site Description

Magodo Residential Schemes fall within Kosofe Local Government Area (LGA) in the North West region of Lagos State (Figure 2 and 3). The Magodo Schemes fall within IkosiIsheri LCDA (Figure 3). Originally designed in 1981 with partial reviews in 1986 and 2010, the schemes cover an approximate total area of 735.16 Hectares with two sectors(Olowora sector also known as Magodo Scheme I and Shangisha Sector known as Magodo Scheme II). Separating the two sectors of the scheme is a gorge/canal, connected to the drainage network of the state (Figure 3). It collects runoffs from the schemes and major parts of the state into the lagoon. The gorge and its surroundings were considered undevelopable and as such remains largely in their natural form. However, with the growing interest in Magodo region, developers and speculators have taken possession of the corridor and some illegal developments sprouting at the peripheries (Figure 5).

The scheme was designed primarily for residential use. It was originally designed for the civil servants, hence, its proximity to the Lagos State Secretariat in Alausa, Ikeja. It is virtually bounded by the Lagos–Ibadan Expressway (Figure 4). This close proximity to the secretariat, high accessibility to major urban centre of Lagos and other parts of the state, coupled with relative serenity and security of the schemes are some of its major pull factors. The review became necessary as a result of the fast growth of unauthorised developments and major contraventions identified within the schemes such as illegal change of land uses; non-conformity with the Certificate of Occupancy issued; non-compliance with approved height restrictions; change in density; over utilisation of permissible buildable area; infiltration of informal activities; encroachment on green areas, open spaces and road alignments.

The consultant, commissioned by the Lagos State Government through NTDA, to review the schemes, had to reach a balance between accommodating new entrants into the scheme and maintaining its sanctity.

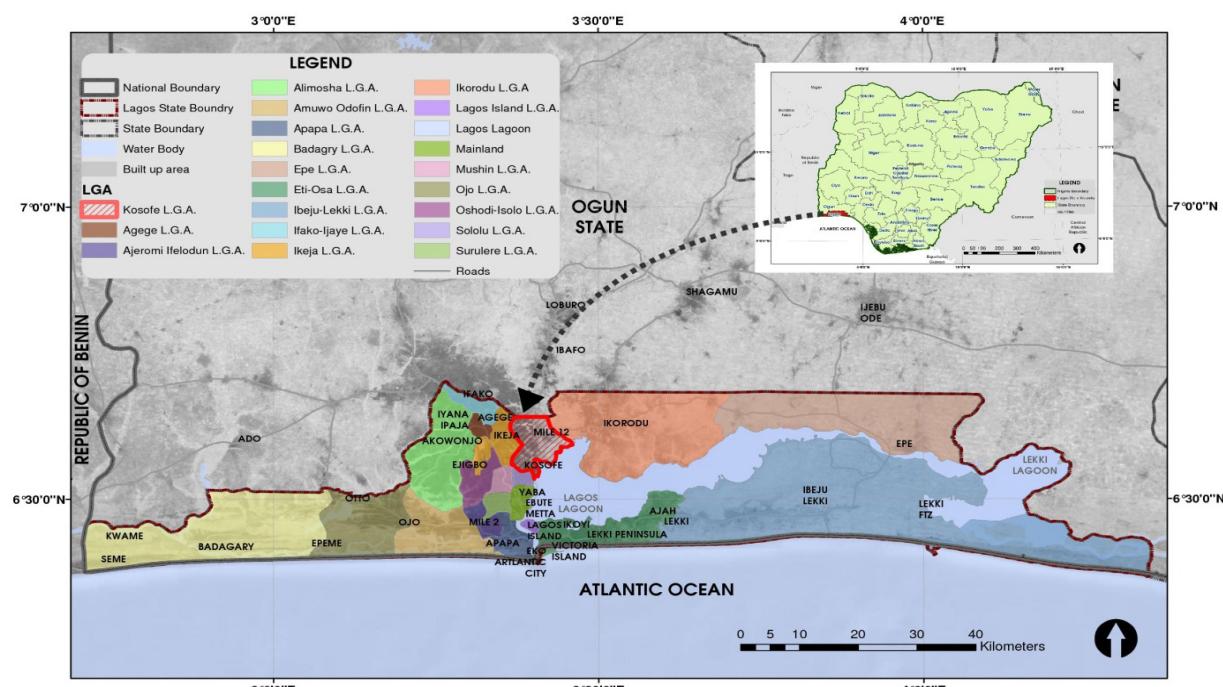


Figure 2: Project Location within its Regional Settings

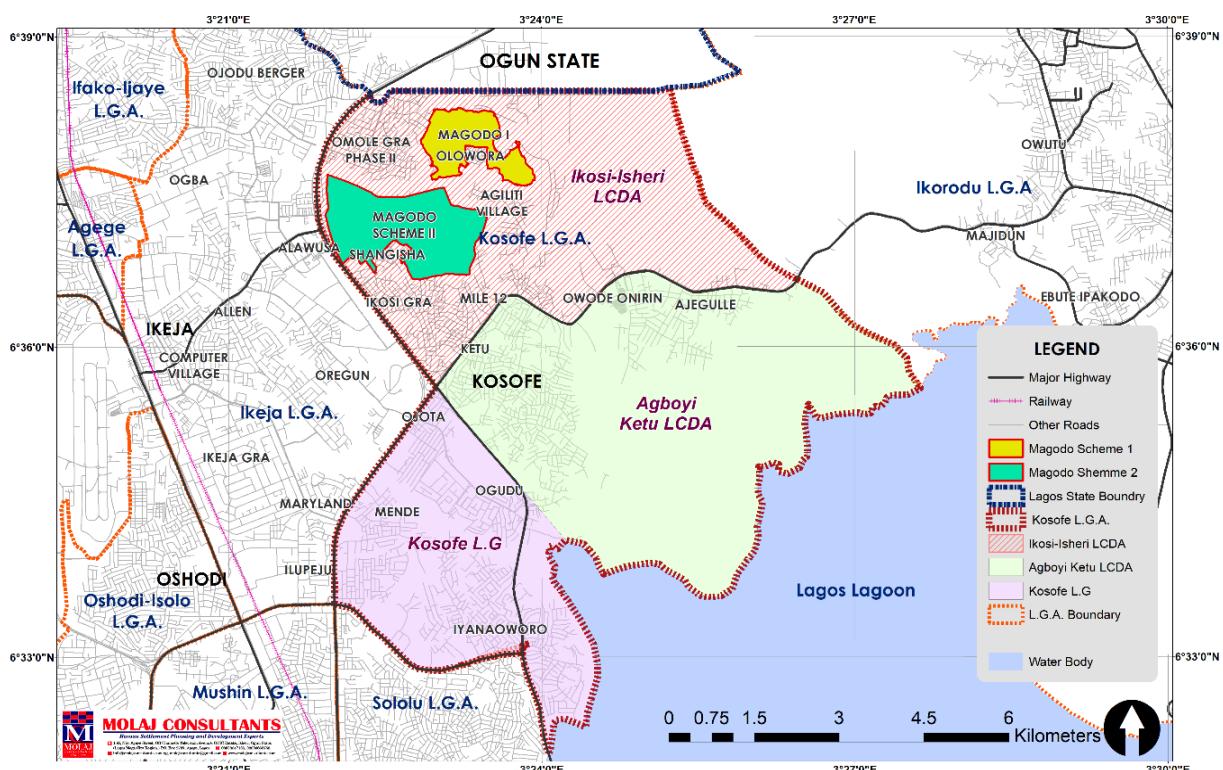


Figure 3: Project Location with Kosofe Local Government

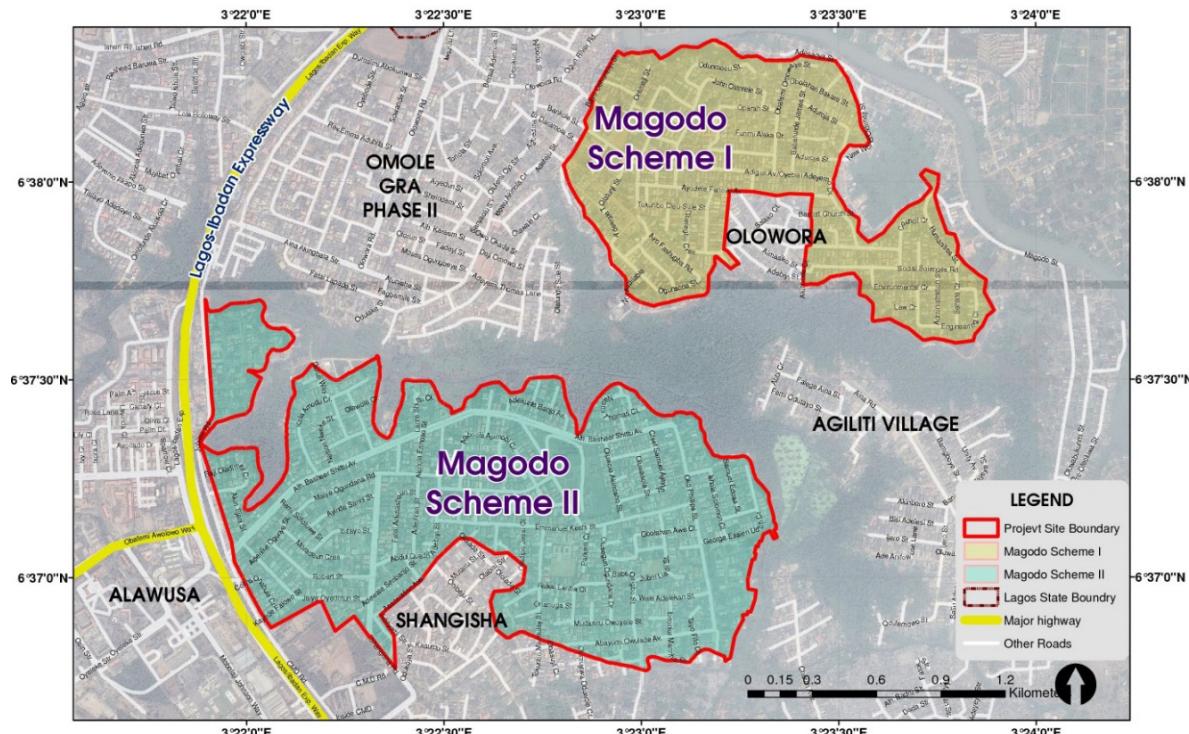


Figure 4: Magodo Schemes and Surroundings



Figure 5: Imagery of the site showing extraneous developments

### 3. Methodology

This paper reports on a study conducted for the review of Magodo schemes in Lagos State. The aim of this paper is to assess the concept of coproduction as a tool for developing resilient city. It employed Participant Observation research method. With this method, the authors doubled as members of the studied group and researchers while taking records of events as they unfolded. The origin, usage, merits and demerits of participant observation research method are well documented in Kawulich's (2005) work titled *Participant Observation as a Data Collection Method*. The method was used because it provides opportunities to gain knowledge and deeper understanding of the actors, interaction, scene, and events at the research site (Allen, 2017), which is paramount for this work.

The Magodo project was chosen as a case study for this paper as it has resemblance of coproduction approach in the planning process. The Case Study is significant as it form the first set of major plan review for NTDA schemes after its establishment in 1981.

### 4. Results and discussion

#### 4.1 Stakeholders Participation and Perceptions

Participation in planning process is usually led by a small member of the community (Parker, et al. 2015) who are the main force behind progress or otherwise. This was confirmed by this research as it was the members of the executive of the Residents' Association that were mostly forthcoming in participation. Parker, Lynn & Wargent, (2015) noted that these key people in the community usually act with key skills or professional backgrounds. Among this set of people in Magodo are those with general town planning knowledge and professionals whose planning knowledge was deemed particularly useful in the planning process, but this affected consensus in most cases.

Despite the initial sensitization, some residents developed apathy with the impression that the whole exercise was borne out of the State's crave for revenue generation while some were frustrated, believing it was just one of the unending data gathering exercise of the government. However, with intense sensitization and assurances, their expectations were renewed, trust gained and participation engendered for the review exercise. The result showed that outcomes could be better where expectations are well managed and good preparation made.

While the early stages of the planning review were more about community development, open and discursive among the interested stakeholders, it later shifted to more technical planning issues, where the professional planners exerted more influence.

Towards the presentation of the draft plan, the residents felt neglected and raised the issues of perceived differences in the draft plan and their ideas. They observed issues of loss of control and ownership, and then decided to move against the entire process thereby delaying the delivery date. Some groups were willing to be pragmatic about the reviewed plan, while others were not. The issues of concern to the residents included the proposal for the development of areas perceived as undevelopable, variegated building height and densification of the scheme which the consultants deemed inevitable for justification of the review. This was associated with the issue of sidelining professional planners into performing task of ensuring procedural compliance, rather than focusing on substantive matters as professionals trained to oversee appropriate scope, inclusivity and to help realise community aspirations (Parker, et al. 2015).

## 4.2 The Coproduced Plan

From the inception of the planning process, the residents were of the opinion that the schemes maintain their old form while improving on infrastructure. The other stakeholders viewed this as virtually impossible given other factors like population growth and policies of the State. This stance of the residence on maintaining old form is against the reflective quality of a resilient city which must be able to accept changes and proffer solution based on emerging evidence rather than status quo. However, efforts were made to ensure that the residents' (end users) contributions remain relevant in the process. The consultants suggested densification of the scheme by proposing increase in number of floors in some sections of the scheme with improvement to roads, which is in line with the policy of the state government. World Bank experts (Lall, Lebrand & Soppelsa, 2021) have also asserted that 'taller buildings are key to enhancing quality of life as the world's urban population grows' This option of vertical increase was not favoured by the stakeholders despite the fact that the schemes still have capacity to absorb more population in a compact manner.

Considering the level of encroachments towards the canal between the schemes (as shown in the imagery of the site in Figure 5), the consultants with other stakeholders including drainage experts from the Lagos State Ministry of the Environment suggested planned and controlled expansion towards the canal to accommodate the new entrants in an orderly manner, halt illegal development and preserve the right of way of the canal. This is in line with the World Bank Report (quoted by Bacchi, 2021) that 'cities must plan how to expand or risk facing uncontrolled sprawl' and must prepare for horizontal expansion as newcomers arrive'

Building a resilient city requires dealing with the issues relating to climate change such as flooding. This requires a well-coordinated drainage system. The need for proactive approach to dealing with flooding issue is essential considering the quest to adapt to climate change in urban planning. With recommendations from other stakeholders and from professional point of view, proposal was made for lining of the canal and construction of canal roads on the two

sides of the canal to facilitate its cleaning and provide access to the new areas. The proposed channelization of the canal will serve as an effective part of the area's drainage system, serving as thorough passage for water from other parts of the city into the Lagoon. In addition, the plan creates an attractive landscape, increased local connectivity and forms a popular part of the Magodo Schemes. This co-design approach shows what can be achieved when there is collaboration among different organs of government working toward a common goal like flood prevention. Venema (2017) identifies **robustness** as one of the key qualities of a resilient city i.e. 'the city is designed to anticipate and respond to potential issues'. One of such examples of **robustness** in urban planning, cited by Venema, was the use of historical data for infrastructure design. Using forecasting and modelling, researchers and engineers are able to estimate future risks (flooding, buildings and infrastructure at risk, etc.) and include design elements to reduce their vulnerability. This provides engineers with a higher level of confidence that their designs can withstand future impacts. This quality of resilience was appreciated in the design of Magodo canal. The acceptance of the design, through the assurance from the Drainage Engineers, reinforced the importance of co-design in urban planning.

Another quality of resilience building is **resourcefulness**, or citizen empowerment. This means that citizens and institutions are aware of risks, able to adapt to shocks and stresses and can respond quickly to a changing environment. The design of Magodo schemes originally made provision for two units per plot of varying sizes. With the increasing desire of populace willing to live in Magodo meeting the capitalist tendencies of residents to make money, plots were been fragmented while some were entirely sold out to developers who were redeveloping above the required units. Others were converting the use from residential to other uses with or without the tacit approval of the approving agencies. While this unregulated tendency is bound to create chaos, the need to increase density in a sustainable manner was evident. Therefore, the review of the scheme, in collaboration with the stakeholders gave considerations to revising zoning policies and urban development standards guiding the scheme. The review was effected by increasing the unit per plot in some sections of the scheme and some corridors were rezoned to permit mixed-use development with considerations for the implication on roads and other facilities. Overall, the Approval Order of the scheme was reviewed in tandem with the reality on ground and consideration for sustainable and harmonious growth.

## 5. Conclusions

This paper elaborates on the concept of co-production that addresses the requirements for delivering resilient cities beyond planning stage. Based on the co-production ladder, the concept is subdivided into three broad sections, where co-production assumes the peak of stakeholders' participation. The concept was emphasized as it deals with service delivery based on contribution from all concerned parties. Although, cutting through the planning process, it was likened to the implementation stage. For this important role of delivering the planned

action or services, the paper concludes that in order to achieve resilience, all hands must be on ground in the implementation of the provisions of the newly revised Magodo scheme.

The imbroglio towards the end of the exercise, which stymied the completion period for few months, raised some concern over the quality and extent of the engagement undertaken. It is therefore recommended that irrespective of the mode of engagement, consulting planner must devise means of balancing the requests from stakeholders with the short and long-term needs of the community. Similarly, as participation entails clear communication among the stakeholders, clear communication medium must be established at all times. The consultants and the government should always be proactive in communications and should keep people better informed of their activities while giving them the decisional high co-production control. Therefore, planners must be tolerant and receptive. In addition to technical skills, they must be equipped with soft skills such as communication, negotiation, conflict resolution, and other related problem-solving skills.

## Acknowledgement

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## Planning Human Settlements for Resilience and Sustainability: A Systematic Review

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### Abstract

*Human settlements across Nigeria have lately been experiencing Natural and Manmade hazards reinforced by climate-related extremes. These extremes events have resulted in disasters of unimaginable proportions leading to desertification, erosion, flooding (air, land, and water pollution) followed by displacement of persons and destruction of properties. These extreme events have also led to shocks and stress that town and cities cannot show resilience to within a measurable timeframe. Planning Human settlements today requires a paradigm shift from planning traditionally practiced to a more inclusive approach that considers environmental planning and management. This paper explores physical, environmental, social, economic, institutional, and innovative technological solutions that must be sought to enhance the resilience of our towns and cities and achieve sustainability of our human settlements through physical planning efforts. This Research used documentary analysis and review of selected works of literature from Google scholars and the web of science to achieve the desired goals of the Research, which seek to make cities and human settlements inclusive, safe, resilient, and sustainable. Targets and indicators were proposed to measure the progress of the sustainable development goals. By 2030, there should be a significant reduction in the social, health, economic and ecological risks and impacts of disasters, environmental change, and disease outbreaks*

*by better designing and managing cities and protecting people in vulnerable situations. This paper explores the vulnerability of human settlement. It puts forward a new paradigm towards making Cities resilient by employing the latest tools such as resource conservation, the built environment, quality built environment, social equality, and political participation to meet sustainable development goals.*

**Keywords:** Resilience, Sustainability, Human Settlement, and Planning

## 10. Introduction

The importance of building a resilient, liveable, sustainable, and more favourable earth for all Humans to live cannot be overemphasized. Since the establishment of the United Nations in 1945, the Organisation has been the backbone of the global goal to achieve a sustainable planet through its various programs. (Gupta and Vegline, 2016).

In the aftermath of the Rio de Janeiro Conference on Sustainable Development in 2012, the Sustainable Development Goals (SDGs) were born and aimed at generating a compilation of global goals that examine the current economic, social, environmental, and political problems facing the world (Gigliotti et al. 2018). Moreover, in formulating regulatory frameworks and implementing these policies, interlinked goals serve as a framework for various world nations (Bali swain and Yan–wallentin 2020, National Planning Commission 2020).

Like other nations of the world, African Nations, which are members of the UN, have indicated a keen interest in achieving Sustainable Development Goals. At the Elapse of MDGs in 2015, the world body came up with Sustainable Development Goals (SDG) and was signed by World leaders. Being an outstanding member of the UN, Nigeria has adopted the sustainable development Goals, put in a clear and definite form of statement, and implemented these goals (Oleribe and Taylor Robinson, 2016). In line with the realization of the SDGs' aim, there has been an effort by the Federal Government of Nigeria despite some inherent challenges to formulate policies and road map towards achieving the Goals (Adesiyan 2018).

The lack of adequate records of serious illnesses, official documents of death, and injuries from disastrous events at all scales that happen every day across many cities in Sub-Saharan Africa have posed a serious impediment to effective planning for reducing risk. Since the turn of the 21st century, becoming Urban through organic development and a high increase in population in Nigeria makes it easy for urban dwellers to be exposed to everyday hazards and disaster risks. These risks, such as exposure, vulnerability, and hazards, are closely related to social services

and the distinct dynamics of different urban forms, city governance, public financing, physical infrastructure.

The Urban poor and vulnerable groups are primarily hit by the increasing pressure for housing, unequal provision and access to an essential public and social services, basic infrastructure, and urban management and planning. If these risks and impacts are to be minimized, all the Abnormalities must be understood. In addition, new forms of vulnerability and emerging Urban risks have arisen due to the emergence of Climate change(Rao et al., 2020). Continuously, there is a notable data gap on the risks Cities in Nigeria face up to this current time. The lack of records of everyday hazards and disaster events at all scales and magnitudes in many African cities is well exemplified in Nigerian Cities Like Port-Harcourt, Owerri, Ibadan, Akure, Kano, Kaduna.

## 2.0 A Review on Critical Issues of Resilience and Sustainability

Urban Resilience refers to any urban system (cities) ability to withstand and recover quickly from multiple shocks and stresses and maintain continuity of services(UNISDR, 2015). With the urban population coming to exceed the rural population around 2032, particularly in Sub-saharan Africa is estimated to increase from 36.3 percent (289 million people) in 2000 to 56.5 percent (1.069 billion people) by 2050(UN DESA, 2017; UNFPA, 2020). However, Duncan & Wilson (2004) and Appleby (2014) warned against using projections like this because of the absence of accurate census data to show current trends in the urban space. As a result, there may be a slow rate of urbanization in Africa compared to what the projection stipulates. However, depending on the economic base and rates of its natural increase, many urban centers in Africa will experience tremendous growth in urban development, although at different rates.

The process of becoming Urban in Africa should not be seen as a challenge. Instead, the degree of distribution and risk is tied down to the management and development of urban areas(Cobbinah et al., 2015a). For example, when there is no protective infrastructure and services, resistant building codes and standards can expose the urban populace to vulnerabilities as they develop unsafe land (Cohen, 2006 and Güneralp et al., 2018). The introduction of hard surface cover that can add to the localized flood risk in areas with no adequate drainage systems are other forms of Urban change that arise due to land modification, which increases the risk (Salami et al., 2017). The inability of the Government at all levels in Africa to provide drainage systems (and other forms of basic infrastructure) in informal settlements, ‘which have been speculated as not being part of the Planning system and urban regulation, is Problematic(Ramiaramanana & Teller, 2021).

According to Sakijege et al. (2014), low-income earners are forced to occupy unsafe land, most times in peri-urban areas. They are faced with the challenge of affordability that limits their access to a decent living environment. This is because most planning policies and building

regulations are not favourable to low-income earners. This forces the poor out of the formal land markets. The failure of Local Government is reflected in the risk accumulation that has emerged in the Lack of adequate and socially just urban Planning and management. This view is now widely covered in the literature(Mohamed Shaluf, 2007;Menoni & Schwarze, 2020; Slavova et al., 2019). This perspective sees disaster as an event that is ‘not natural’ and (re) produced and heated by the accumulation of risk. Its underlying economic dimensions such as social (e.g., social-spatial fragmentation), political (e.g., little or no decentralization and democratization), institutional (e.g., lack of institutional capacity), and fiscal (e.g., investments in buildings and infrastructure in areas prone to hazards).

Conflict and violence are also underpinning risk accumulation processes associated with hazards occurring daily. While there is no such evidence that connects the violence of urbanization and social unrest per se, Moncada (2016) suggests that through the development of more robust urban governance with the help of more effective local governments, these factors must be addressed through an increased focus on putting to check the complex political dynamics that the management and urban planning ineffective. Hence the need for Research to develop a strong understanding of the underlying and overlapping factors that motivate risk accumulation across the continuum and seek to provide policy-relevant evidence that can be used to make all-inclusive risk reduction strategies. This expects undivided attention on the institution that shapes organizational structure and the behavior of individuals and depth for action in the City (Humphrey, 2013).

To identified the risk and loss because of ongoing interaction between urban interests, historical lenses are used. This interest through formal legislation and policy are exerted on City through informal mechanisms or outside the range of interest of the state and Government institutions. In shaping the City and its risk, the interest of the Local Government and private sector must be active and are affected as a result of actors operating above and beyond the City in National and adjacent rural space, those shaping conflict and rural fall or development all-inclusive(Davis, 2020).

The direct and indirect effects of climate change are gaining momentum or likely adding more power to a range of existing risks related to environmental health and hazards and creating new chances (Venton & La Trobe, 2008; Kelman, 2015 and Booth et al., 2020). However, due to the lack of relevant local data and local analysis, more significant information in Africa is widely unknown(Simon & Leck, 2015).To assess the anticipated impact of climate at the city level and inform urban adaptation strategies, the downscaled Climate models are standard; nevertheless, few regional climate models or empirical downscaling exist in Africa. Within the literature of community-driven disaster risk reduction and climate change adaptation in the urban areas, there is a growing recognition of the usefulness of drawing on the knowledge and experience of communities in tackling and adjusting to variations in climate change(Lassa et

al., 2018 and Saja et al., 2020).

Subsequently, researchers on this subject matter will need to emphasize the importance of in-depth knowledge of how urbanization processes affect risk and the usefulness of knowledge co-production of scientific consideration and community-based information. As shown by the United Nations International Strategy for Disaster Reduction (UNISDR), My City is Getting Ready! Campaign. So much of the responsibility for risk-reducing infrastructure and services falls on the Local Government, which plays an essential role in disaster risk reduction, a plan for Urban Africa's local capacity to act in an urban context(UNISDR, 2015). The functions of Local Government include providing basic infrastructure and services, Urban Planning and administration (which consists of the Design and building codes and standards enforcement), issuing building permits. These roles aim to ensure a resilient and safe environment ("Becoming More Sustainable," 2011). Nevertheless, local government's insufficiency to mitigate the effects of risk through adequate planning in many low and middle-income countries is apparent due to their limited power and resources and sometimes contradictory relationship with the most vulnerable and the poor(Cobbinah et al., 2015b). Also, the rationale why local governments and her Planning system are not effective after the colonial African cities are appropriately documented(Omer, 2011 and Currie & Musango, 2017).

City Governments have collaborated with the local populace and civil society organizations to mitigate the effects of risk and build resilience to intense weather, hence the need for proper documentation of this works. One significant and priceless opportunity explains how the process of community-driven 'slum' upgrading as a form of cooperation (Bhatkal & Lucci, 2015). This is the ongoing work with the National Federations of Slum/shack dwellers international (SDI), active in 15 countries in Africa (Patel et al., 2001). This collaboration can help impair risk as they contribute to a broader transformation of the society within the context of urban poverty reduction(UN DESA, 2017).

### **3.0 Sustainable Development Goals of the United Nations**

The Sustainable Development Goals call for a more comprehensive contribution towards implementation in all spheres because every contribution will impact. In a developing country like Nigeria with a significant level of changing environment and growing inequality, the performance of sustainable Development Goals will help create better opportunities for local communities and use this global momentum to push towards achieving the goals and create a better world for us all. Therefore, to ensure resilience and sustainable human settlement for Nigeria, all 17 SDGs must be critically considered. These are as stated below.

## **1. No Poverty**

From our current physical environmental situation in the country, there is a call for the design and implementation of the safety net mechanisms to Strengthen the Resilience of the poor to the impact of disasters. Disaster risk reduction and risk-informed development are tools to break the cycle of exposure to hazards and entrenched poverty. In addition, a genuine empowerment program targeted at the youth and most vulnerable groups will contribute immensely towards achieving the Sustainable Development Goal of eradicating poverty and building a more robust citizenry to comeback and withstand the shock of the disaster.

## **2. Zero Hunger**

Eliminating hunger is a prerequisite to the motive of reducing the risk of disasters. The protection of productive assets and livelihood is essential for food security. An integrated disaster risk and food security assessment is an early warning mechanism and an innovative financing tool to curb agricultural and economic losses caused by Natural Disaster.

## **3. Good Health and Wellbeing**

The nation's health care system should integrate disaster risk management into primary, secondary, and tertiary healthcare and promote and enhance training capacities in the field of disaster medicine. The substantial reduction of disaster damage to critical infrastructure and disruption of basic services is essential to ensure healthy lives and promote wellbeing.

## **4. Quality Education.**

There is a great need to increase public awareness of the dangers of disaster and risk awareness and reduce disaster risk on educational facilities. This will enhance the sustainable development goal of inclusive and equitable quality education by reducing the disaster losses to educational facilities and the disruption of educational services.

## **5. Gender Equality**

There is an international call for women to be placed equally as their male counterparts. They need to promote gender sensitivity, equitable and accessible disaster risk reduction policies, plans, and programs, and adequate capacity-building measures to empower women for preparedness and build their capacity to secure alternate means of livelihood in a post-disaster situation.

## **6. Clean Water and Sanitation.**

The education and training of community health practitioners in disaster risk reduction approaches and ensuring compliance with existing health and safety standards with an adequate focus on disaster risk management will build resilient health systems. In addition, there is strong advocacy for resilient water infrastructure to remain practical and operational during and after the disaster to provide live savings and essential services and limit the spread of diseases.

## **7. Affordable and Clean Energy**

There is a need for sustainable use and management of ecosystems and integrated environment and natural resource management approaches incorporating disaster risk reduction. Transboundary cooperation in ecosystem-based systems to shared natural resources builds resilience and reduces disaster risk while achieving the sustainable development goal of affordable and clean energy.

## **8. Decent Work and Economic Growth**

There is a need for a substantial reduction of disaster economic loss concerning global GDP by 2030. Public and private investment in disaster risk prevention and reduction through structural (e.g., infrastructure) and non-structural (e.g., Legislation/ disaster preparedness plans) measures can enhance the economic resilience of people and drive innovation, economic growth, and job creation

## **9. Industry, Innovation, and Infrastructure**

Building and rebuilding better from the start through proper design, construction, and retrofitting to withstand hazards will contribute to achieving the Sustainable Development Goal on the industry, innovation, and infrastructure. The Sendai Framework also prompts investments in innovation and technology development in disaster risk management research.

## **10. Reduce Inequality**

In line with the Sendai Framework, there should be prompts tackling the underlying disaster risk drivers, including poverty and inequality, while supporting developing countries' capacity to implement inclusive and people-centered disaster risk reduction strategies to help reduce disparities.

## **11. Sustainable Cities and Communities**

Promotes the mainstreaming of disaster risk assessments into land-use policies, Urban Planning,

land degradation assessment, and informal housing to increase urban resilience, mechanisms for disaster risk transfer and insurance for both public and private Investment can reduce the financial impacts of disasters in urban and rural areas communities

## ***12. Responsible Consumption and Production***

The protection of livelihood and productive assets, the Sustainable use and management of ecosystems and natural resources, and the incorporation of disaster risk reduction measures into multilateral and bilateral development assistance programs will contribute to achieving the Sustainable Development Goal on responsible consumption and production.

## ***13. Climate Action***

Over the last two decades, more than 90% of major disasters have been caused by floods, storms, heatwaves, drought, and other weather-related events expected to increase in frequency, duration, and severity due to climate change. These events, in turn, can trigger or contribute to wildfires, famine, health emergencies, and other disasters. Reducing the risk of these disasters is a fundamental aspect of climate change adaptation and sustainable development.

## ***14. Life Below Water***

Corals reefs and coastal systems play an improvement role in protecting communities from storm surges and other hazards. The sustainable use and management of ecosystems and the implementation of integrated natural resource and environmental management approaches incorporating disaster risk reduction will contribute to the Sustainable Development Goal on life below water.

## ***15. Life on Land***

To preserve ecosystems and reduce environmental losses, there is an urgent callfor mainstreaming disaster risk assessment, mapping, and management into rural development planning and as well as protection of mountains, rivers, coastal flood plain areas, drylands, wetlands, and all other areas prone to droughts and flooding.

## ***16. Peace Justice and Strong Institution***

Disaster risk reduction and management require full engagement and accountability of all state institutions at national and local levels. In line with the Sendai Framework, there is a call for increased disaster risk governance and accountability, including national disaster risk reduction platforms.

## 17. *Partnership for the Goals*

Support, including through finance, technology transfer, and capacity building from developed countries and partners, as well as an enabling international environment, can all stimulate knowledge, capacities, and motivation for disaster risk reduction. This will contribute to achieving the Sustainable Development Goal on partnership for the goals. (UNISDR, 2015). These Sustainable Development Goals such as Goal 9 (Industries, Innovations, and Infrastructure), Goal 10 (reduced inequality), Goal 11 (sustainable cities and communities), Goal 13 (Climate Action), Goal 17 (Partnership for the Goals) are the background for sustainable human resettlement planning to engender resilience.

## 4.0 Risk Drivers in Nigerian Cities.

Some critical drivers of exposure to hazards and vulnerability are City Governance, public finance, inadequate infrastructure, and Poor Planning. They are discussed as follows:

### i. City Governance

The process of human settlement planning (Jain, 2019) is linked with the system of governance that articulates civil society's participation, addresses issues of transparency and ethics, and democratic decentralization of decision-making processes. This directly bears the environment, urban poverty, infrastructure essential services provision, equity, and capacity building. The form of governance prevalent in the country at all levels is generally bureaucratic and involves conservative controls. With the enactment of the Urban and Regional Planning Law, all tiers of the government have been assigned more significant roles in urban planning and governance. However, this has not happened in most states effectively, as higher-level governments are reluctant to part with the powers they already hold. This has dramatically affected the smooth operation of the Urban and Regional Planning Law, especially at the local government level. As a result city governance structure needs to be revamped to encourage subsidiarity in governance by granting more powers to the local administration. A shift toward sustainable development will involve a revival of notions of community and collective provision and intervention. Sustainable development cannot be achieved without political commitment to make the necessary changes, and this is through effective city governance.

### ii. Public financing.

Shortage of public finance is the major problem facing Planning for Disaster Management and Building Resilient Cities. Across the country, successive governments at different levels have poor urban governance structures and financial management. System revenue from oil production is the primary source of Nigeria's earnings. However, the daily oil production has reduced due to the fall in global oil price in mid-2014, neglect of oil refineries to rot due to

lack of maintenance and infrastructure upgrade. This drop in oil revenue has reduced the allocation given by the Federal Government to all states and local. During the past decade, the annual domestic debt has increased in multiples. The impact of this fall in oil price has led to the non-payment of salaries to civil and public servants and rising inflation, which has posed untold hardship on the citizen. The impact of a fall in finance and a high increase in domestic debt servicing for states has resulted in a general fall in the allocation for social services. For example, this past year, bedeviled with coronavirus pandemic and the end SARS protest, the Imo State, the health and entrepreneurship sector received the most significant attention. Through successive Governments, there has been less substantial investment in human settlement planning and environmental development. This is a result of low budget allocation to departments.

### iii. Access to infrastructure and essential services

Some situations or elements concerning essential infrastructure and services constitute everyday hazards and disaster risks. Citizen's lack of access, or inadequate access, to critical services (e.g., healthcare, public transport, emergency services) and infrastructure (e.g., roads, drains, and water supply and sanitation) are factors to be considered in planning sustainable human settlements. For example, the health risk is increased by inadequate sanitation and poor access to safe water supply, growing diarrhoeal diseases. Therefore, providing adequate urban infrastructure and essential social services is a prerequisite for sustainability and resilient human settlement development.

In most Nigerian cities, the pattern and quality of the road network in the traditional core area and, to some extent, in the newer settlement areas are in a deplorable state. Most places are not easily accessible as most roads are substandard. Most newly developed areas have inadequate road networks, or they are dilapidated. The financial incapacity of most local governments cannot afford the provision of the street and local roads. The consequence of changes in the national economy is because there is no synergy between city governance and urban management. Inadequate or no physical planning has exacerbated the transportation problems in many cities, leading to the inability of local and state governments to adequately control and manage the public transport system, a component of human settlement planning.

Currently, in most Nigerian cities, hundreds of small taxis and minibusses are public transport media. In addition, several thousands of motorcycles and tricycles operate within metropolises compromising safety measures in the movement of goods and services.

Water and sanitation coverage within most cities in Nigeria are unsatisfactory. Water is an essential abiotic component of the environment. It is not easy to imagine a clean and sanitary environment without water. Nevertheless, rapid population growth has not been accompanied by increased essential urban services such as water supply and sanitation. This poses a risk to the

right of the public to healthy living. The analysis of water available for distribution and water requirements shows that in Most Nigerian Cities, waterworks function at 15.8% capacity and has been experiencing a shortfall since the turn of the new century(Ezeudu, 2019).

Similarly, there is a high indication that sanitation facilities are inadequate. There is an absence or near absence of sanitation facilities as a large population uses open fields and the river for defecating(Alfa et al., 2018). The influx of people into cities exacerbates this, and uncontrolled development in the urban area has worsened the inadequate water supply situation.African Development Bank (2019) stated that about 75 percent of the city population has no access to the municipal potable water supply, while access to good sanitation was only 33 percent.

Most households in the urban centers in Nigeria are connected to the national grid. Still, they experience inadequate supply not because they are not connected to the national grid. Still, epileptic supply is the main challenge facing Nigeria's residential, commercial, and industrial sectors (Emodi & Yusuf, 2015). The country's electricity production is primarily from hydro and thermal sources, yet the available electricity output is far less than the demand. The shortfalls in electricity production and distribution in the residential and commercial sectors drive off-grid power generation by individuals and corporate bodies in Nigeria(Adhekukoli, 2018).The off-grid power generation is mainly produced using gasoline/diesel generators that are not environmentally friendly and constitute an increase in the country's carbon footprint. Off-grid power generators, also known as "backup generators," continue to grow, from slightly over 60% in 2002 to more than 80% in 2014, exposing the non-functional power sector in Nigeria. An average of 84% of urban households depends on gasoline or diesel-powered generators for electricity supply, while the rest live without electricity(Elinwa et al., 2021). Generally, generators are too expensive for low-income households. The primary cause of fires in the cities is traceable to the use of generators and petrol storage, in residential places and places of work, and private/illegal electricity connections (Babatunde et al., 2020).

Ensuring healthy living and promoting wellbeing for all ages is the 3rd Sustainable Development Goal (SDG). Inequality in access to health care remains one of the primary challenges in achieving the goal. With the ever-increasing expansion of urban areas and population growth, there is a need to regularly examine the pattern of accessibility of basic amenities across regions, States, and metropolitan regions.(Lawal & Anyiam, 2019) Health gains frequently associated with income growth have been stubbornly slow in Nigeria in the past 25 years. One plausible reason for this stagnation is underperformance in the country's primary health care (PHC) system(Kress et al., 2016). Access to healthcare is not evenly distributed in cities in Nigeria, and health care exists in private and public health facilities. Healthcare is not readily accessible to most urban poor due to the high cost of personal health services. Effective delivery of healthcare services requires adequate infrastructure, diagnostic medical equipment, drugs, and well-trained medical personnel. In Nigeria, insufficient funding and mismanagement of health

institutions often characterize healthcare service delivery has come under some persistent criticisms, which calls for serious concern in planning for Resilience and disaster Management (Oyekale, 2017) and sustainability.

## **5.0 Critical Challenges towards Planning for Sustainable Development in Nigeria.**

- i. Various Government agencies cannot build adequate information and database to guide decision-making and practices. This is because very few government parastatals and agencies access ICT platforms for data storage and retrieval.
- ii. There are no reliable official records of death and births in most Nigerian Cities. Through the national population commission, the Government has made provisions for birth and death documentation. However, these have not yielded the desired result due to a lack of synergy between the relevant agencies in transmitting their data to the commission.
- iii. In most Government Agencies, especially at the Local and City level, their records are primarily processed manually, which is time-consuming in collecting and storing data and susceptible to data loss.
- iv. Lack of transparent and accountable public finance, good city Governance, poor infrastructural services, and poverty are the key drivers of exposure to hazards and vulnerability.

## **6.0 Making Cities Resilient.**

In Planning Human settlements for resilience, the United Nations Office of Disaster Risk Reduction UNDRR (2015) had developed ten essentials categorized as Enabling, Operational, and Build Back Essentials, which, if adopted, can help reduce the vulnerability of our human settlements to risks associated with disasters.

### ***The enabling essentials.***

#### ***Essential 1: Organize for disaster resilience.***

This requires an organizational structure to be established by the appropriate state or local authorities to identify the necessary processes to understand and reduce people's exposure, impact, and vulnerability to disaster.

## ***Essential 2: Identity, Understand and Use Current and Future Risk Scenarios***

City Governments and Authorities should identify and understand their risk scenarios and ensure that all stakeholders contribute to and recognize these tools.

## ***Essential 3: Strengthen Financial Capacity for Resilience.***

This Means understanding the economic impact of disasters and the need for Investment in Resilience. Each level of recumbent must identify and develop financial mechanisms that can support resilient activities.

## ***Operational Essentials.***

## ***Essential 4: Pursue Resilient Urban Development and Design***

This ensures that the built environment is assessed and made resilient as applicable through sustainable environmental planning and design.

## ***Essential 5: Safeguard Natural Buffers to Enhance the Protective Functions offered by the Natural System.***

In Planning human settlements, efforts should be made to identify, protect, and monitor critical ecosystem services that confer the disaster resilience benefit. In addition, low carbon development needs to be transformed into the management of the environment.

## ***Essential 6: Strengthen Institutional Capacity for Resilience.***

Efforts should be made to ensure that all institutions relevant to a city (human settlement) resilience can discharge their roles, such as National Emergency Management Agency, State Emergency Management Agency, Local Emergency Management Agency, and Fire Service even police.

## ***Essential 7: Understand and Strengthen Societal Capacity for Resilience.***

This could be achieved by strengthening social ‘connectedness and a culture of mutual relationship or network that significantly impacts disasters of any given magnitude.

## ***Essential 8: Increase Infrastructure Resilience***

In planning critical infrastructure for our settlements, it is essential to understand how the

infrastructure system will cope with the disasters that a city or territory might experience and develop contingencies to manage risk caused by these outcomes.

### ***Build Back Essentials***

#### ***Essential 9: Ensure Effective Preparedness and Disaster Response***

Equip all agencies to enhance disaster preparedness for effective response by installing earlier warning systems and building emergency management capacities in NIMET, NEMA, SEMA, and LEMA. These institutions must be well equipped for the earlier warning system to alert the stakeholder of an impending disaster.

#### ***Essential 10: Expedite Recovery and Building Better***

There is a need to plan and prepare for disruption in cities' services and supply to development before they occur. There is a need to learn from the previous failure by understanding why the damage occurred and ensure that the lesson learned is incorporated into reconstruction processes. These efforts are necessary to ensure the resilience of our cities to hazards

### **7.0 The Goals of Sustainable Development.**

For development to be sustainable, we have identified five fundamental goals that should guide all decisions concerning future growth and pursue which effective policies need to be developed(Blowers, 1993).

#### **i. Resources Conservation**

Sustainable development involves the continuing supply of resources for future generations. It means the efficient use of non-renewable energy and mineral resources through higher productivity, Recycling, the development of alternatives technologies, and substitution where this is possible and not environmentally harmful. It also requires the protection of biological diversity, thereby maintaining the potential of species and habitats to assist agriculture, medicine, and industry. Therefore, there is a need for a more detailed survey of land and resources in rural and urban areas of the country. The goal of resource conservation can be summarised as to ensure the supply of natural resources, which will significantly assist the public financing of Regional Planning, Urban management, and environmental Development for the present and future generations through the efficient use of land, less wasteful use of non-renewable resources and their substitution by renewable resources wherever possible, and the maintenance of biological diversity.

## ii. Built Environment

This goal is concerned with physical resources (natural and manmade) and their impact on the land. Resources conservation requires patterns of development that minimize energy consumption, maintain land productivity, and encourage the re-use of buildings. The size, density, and location of human settlements most appropriate for sustainability will vary in the light of technological innovations in energy, construction, manufacturing, and transportation. The goal of built development is to ensure that the development and use of the built environment respect and is in harmony with the natural environment. The relationship between the two is designed to be one of balance and mutual enhancement.

## iii. Environmental Quality

Development must also respect environmental quality. As a result, processes must be avoided which degrade or pollute the environment and reduce its regenerative capacity. Therefore, a third goal is to prevent or reduce processes that degrade or debase the environment, protect the regenerative capacity of ecosystems, and prevent detrimental developments to human health or diminish the quality of life. It must also aim to improve and enhance environmental quality, especially in those areas already degraded or grossly polluted. This brings us to the fourth goal, social equality.

## iv. Social Equality

Under present economic arrangements, trade patterns, aid and Investment are shaped mainly by the demand of wealthy countries. Implicit in these patterns is inequality that intensifies the pressure on the environment through resource exploitation, the destruction of the ecosystem, and pollution. Thus, promoting greater social equality will not achieve sustainability since both rich and poor degrade the environment. Nevertheless, the conflicts that arise through inequalities constitute a significant obstacle to cooperation.

There is also the need to bequeath to the future environmental resources at least as good as today. This is the principle of equality between generations. Therefore, policies that seek to reduce social inequalities and conflict within and between countries are in the long-term environmental interest of rich and poor alike. Sustainability is a moral and social, and physical concept. A further goal is to prevent any development that increases the gap between rich and poor and encourages development that reduces social inequality.

## v Political Participation

Greater equality means fundamental changes, consumption patterns, resource allocation,

and, consequently, lifestyles. Contemporary practices of living in Developed countries based on individualism, competition, and conspicuous consumption are not sustainable. A shift towards sustainable development will involve a revival of community, collective provision, and intervention notions. A sustainable environment cannot be achieved without the political commitments to make the necessary changes. The changes envisaged in the way we lead our lives are radical in their scope and implications. Today's challenge is not to incorporate green objectives in the maps and text of five-year plans but rather to change our values, attitudes, and behavior by encouraging increased participation in political decision-making and initiating improvements at all levels from the local community upwards.

## 8.0 Future Challenges for Planning

There is an excellent concern to better our view of planning and the environment. Instead of seeing Urban and rural areas as needing separate policies, we now see the whole as one environmental issue to be tackled anew. Planning for sustainable development implies a further widening of scope. Although land-use planning has undoubtedly sought to protect the natural environment from development, the main emphasis has been saving wildlife habitats and enhancing the landscape.

So much for current practice, what of the future? Our Planning system was inherited from the colonial masters, which appeared to be relatively self-contained entities. However, the introduction of green belts, the location of new and expanded towns, and the building of motorways were gradually changing the concept of the City into a much wider one of interdependent local economies that required some regional planning. At the same time, a primary international concern was intruding on the scene: the severe threat to the environment as a whole, in particular to the ozone layer, the climate, and biological diversity, by carefully planning settlements so that fewer people are vulnerable to natural hazards. As a result, human settlements will become more liveable, and cities will better cope with environmental challenges.

Urban growth has enormous impacts on the local, as well as the global, environment. Planning should support environmentally friendly forms of transport and sustainable building and conserve environmental assets. More efficient and economical city forms, where legal and governmental systems can deliver them, are vital elements for environmental sustainability. Urban growth is a significant cause and Consequence of economic growth and opportunity. By adopting a livelihood focus, planning must help to tackle urban poverty and rural-urban migration.

Urban Planning can also focus on crime prevention and is crucial to post-disaster and post-conflict reconstruction. Planned reconstruction and governance approach that emphasizes inclusiveness and partnership will nurture social and civic capital. Plans provide a framework for different interests to work together in a common purpose and a transparent and accountable

arena to negotiate conflicts over development, both within civil society and private and public interests. Cities are where people access new ideas and find ways to live together as communities and with strangers from different backgrounds and cultures.

However, limited daily attention has been given to protecting the environment from abuse of land uses and pollution from human activities. No planning considerations are made. Today Planning considerations extend to resource management in the sense of conserving the natural resources that go into building materials, the energy required to make them, and the buildings and the scope for recycling waste from development.

It is now necessary to envisage environmental planning as an integrated process that ensures that sustainability is built in as a primary objective across the range of policies, i.e., energy, transportation, pollution, industrial, agricultural development.

## **9.0 Conclusion.**

The Ten Essentials for making Human Settlement Resilient prepared by UNDRR in 2015 and the Sustainable Development Goals (UN, 2015) are thematic areas and the roadmaps for sustainable development in cities and communities. These goals and essentials recognize global developmental issues as it concerns towns and their inhabitants. A dedicated goal (SDG 11) focused on cities and human settlements. Although there is a call for the leadership of nations, state, and local governments to create a partnership toward achieving these global goals, the role of the local actors extends beyond achieving SDG 11. The impact of these goals on international sustainable development will largely depend on the world's ability to transit to new governance for sustainability that recognizes the roles and responsibilities of local and subnational governments. Local governments in urban, peri-urban, and rural areas are best placed on linking all global goals within their work areas to benefit their local communities.

As the global population is becoming increasingly urban, cities will eventually determine countries' successes and failures. Equally critical is how urban communities interact with peri-urban and rural neighbours to address the practical resource and service provision needed to make cities and human settlements inclusive, safe, resilient, and sustainable. Local governments' proximity to citizens means they have the transformative power to understand and influence people's attitudes and behaviour. To become catalysts of change, whether in addressing poverty, decent work, or sustainable infrastructure. Local governments require additional political and financial powers to implement new changes.

We believe that Human Settlement in Nigeria must incorporate all the ten essential elements of making cities resilient and the 17 goals of Sustainable Development. These elements and the goals address all physical, economic, and social dimensions that will improve livability, quality

of life, and inclusiveness.

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# Developing a Framework for Climate Change Resilience in Nigeria: The Implications of Planning Laws and Regulations

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### Abstract

*Of all the modifications humans have made to the biosphere, none are as destructive and far-reaching as climate change. Climate change is a threat multiplier that aggravates other challenges facing human settlements. The impacts of climate change in Nigeria are as varied as its diverse ecological regions manifesting in the rising frequency and intensity of extreme temperatures, sea level rise, severe storms, heat waves, perennial drought, and seasonal wild fires. These climate related shocks and stresses are compounding livelihood risks and inhibiting the resilience of communities. Although, the resilience narrative is unravelling new ways humans and human settlements can bounce back or bounce forward from climate change challenges, there are only a few studies on resilience in Nigeria. Resilience thinking is anchored upon policy and guidelines underpinned by planning laws and regulations. The actualization of resilience interventions depends upon the responsiveness of planning laws and regulations. In this study, the effectiveness of planning laws and regulations in Nigeria to support climate change resilience is examined in comparison with international best practices with a view to developing a climate change*

*resilience framework implementable across Nigeria within existing legal and institutional contexts.*

**Keywords:** Climate Change, Resilience, Planning, Laws, Regulations

## 1. Introduction

Climate change is often described as the greatest challenge facing humanity and the projections of climate change indicate that it may potentially impair every natural and human system (UNFCCC, 2012; IPCC, 2013; BRAC, 2020). Projected climate change impacts will differ across continents, regions and countries manifesting in warming global temperature, rising sea levels, unpredictable precipitation, desert encroachment in the sub-tropics, melting of glaciers and sea ice in temperate and polar regions, more frequent extreme weather events including heat waves, droughts, rainstorms, snowstorms and windstorms, rising frequency and intensity of flooding, ocean acidification, and biodiversity loss (Adewole, Agbola & Kassim, 2015; McEvoy, 2019).

In Nigeria, climate change is creating new challenges and compounding existing ones. Nigeria is located on the coast of West Africa and is the most populous country in Africa with a land area of 923,768 square kilometres, the fourteenth (14th) largest in Africa (FME, 2016). It employs a federal political and administrative structure with thirty-six (36) states and a Federal Capital Territory as well as seven hundred and seventy-four (774) local government areas (NPCC, 2013). The political and legislative structure is three-tiered comprising the federal, the state and the local. Climate change impacts in Nigeria vary across its ecological zones. The climate is typically warmer and drier northwards into the hinterland from the coast off the Atlantic Ocean. Although, variations in weather patterns, warmer temperatures, reduced rainfall and increased rainfall intensity are widespread national climate change challenges, impacts experienced in the northern and southern regions differ significantly. The major climate change impacts in the north are windstorms, heat waves, drought and desertification reinforced by the perennial southward trajectory of the Sahara Desert, while in the south, sea-level rise, coastal flooding, rainstorms and flooding are the major climate change impacts (Sayne, 2011).

Resilience evolved to address the multifaceted impacts of climate change on urban systems, communities and livelihoods (BRAC, 2020). The resilience of cities and regions is determined in part by their relationships with ecosystems, social networks, governance structures and infrastructure systems that can plan for and respond to a variety of demographic, economic and environmental changes exacerbated by climate change (Harrison, Bobbins, Culwick, Humby, La Mantia, Todes, and Weakley 2014). Climate change resilience adopt strategies in tandem with changing realities and local peculiarities. Developing a framework for climate change

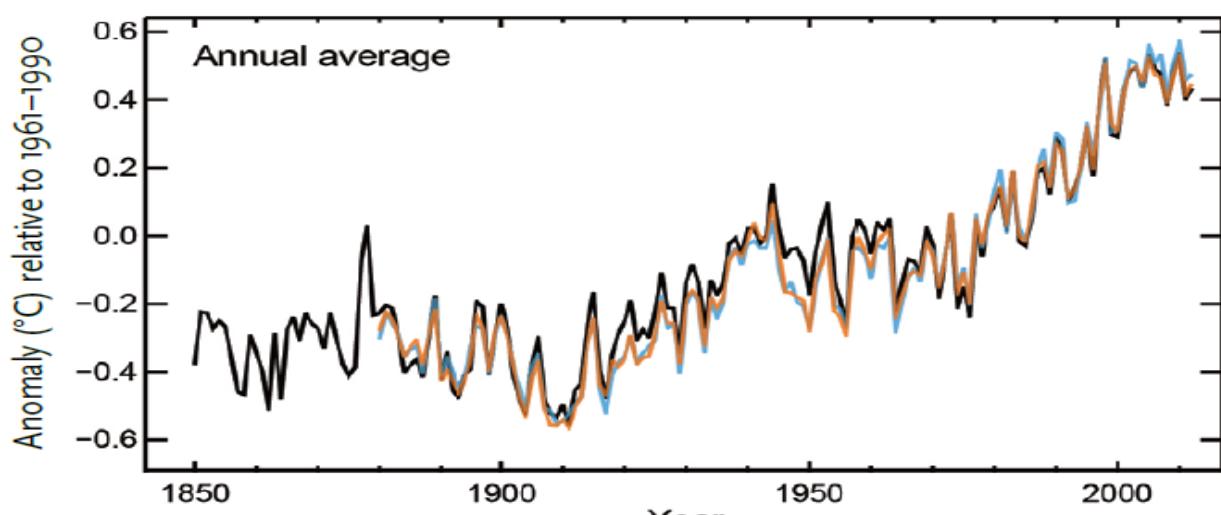
resilience aims to address present and future environmental, social and economic stresses of climate change impacts (Harrison et al., 2014).

Planning plays a vital role in climate resilience (MacClune, Tyler, Opitz-Stapleton, Hawley, & Khan, 2013). Planning within the climate resilience framework is hinged upon effective legal mechanisms to implement resilient action plans. Resilience thinking is anchored upon policy and guidelines underpinned by effective planning laws and regulations. The responsiveness of planning laws and regulations to climate change resilience is examined in comparison with global norms with the rationale to develop a climate resilience framework for Nigeria within existing legal/institutional contexts.

Following this introduction, is the section on climate resilience framework, a synopsis and implications of planning laws and policies in Nigeria with import upon climate change resilience, the proposed climate resilient framework for Nigeria and the concluding section.

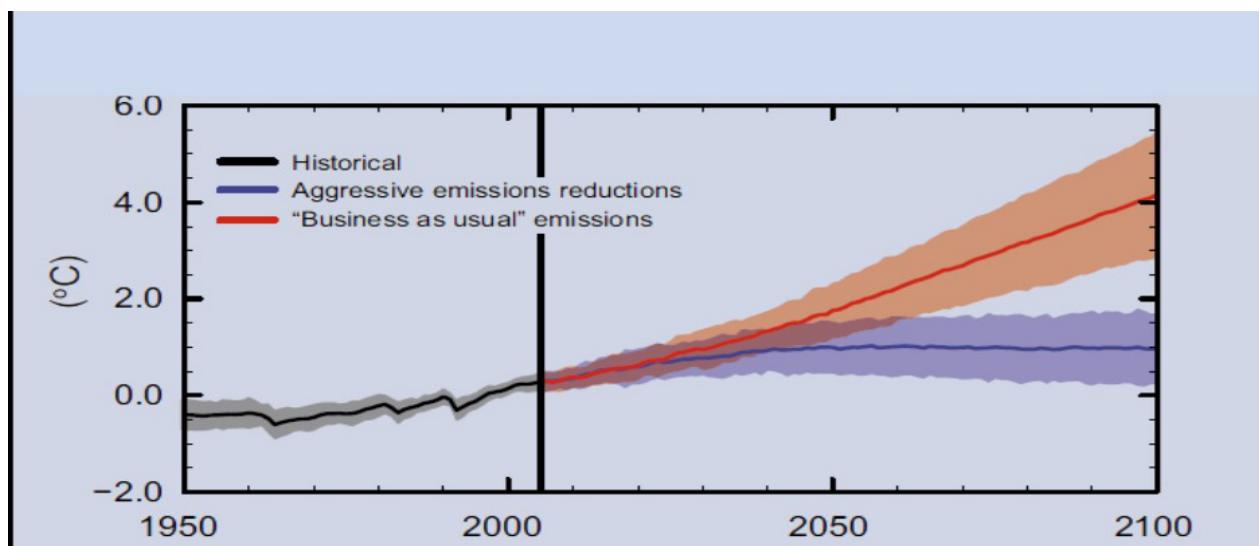
## 2. Climate Change Resilience Framework

Climate change is a change in the statistical distribution of weather patterns, a change in average weather conditions, or change in the time variation of weather around longer-term average conditions when that change lasts for an extended period of time usually from decades to millions of years (IPCC, 2013). Climate attributes include temperature, humidity, precipitation and wind. Global average annual temperature has risen by about  $0.6^{\circ}\text{C}$  since the beginning of the twentieth century, with about  $0.4^{\circ}\text{C}$  of this warming occurring after 1970 (Figure 1). Future projections (Figure 2) indicate that the rising trend will not abate unless significant efforts are instituted to forestall global warming.



**Figure 1: Global Average Annual Temperature 1840–2012**

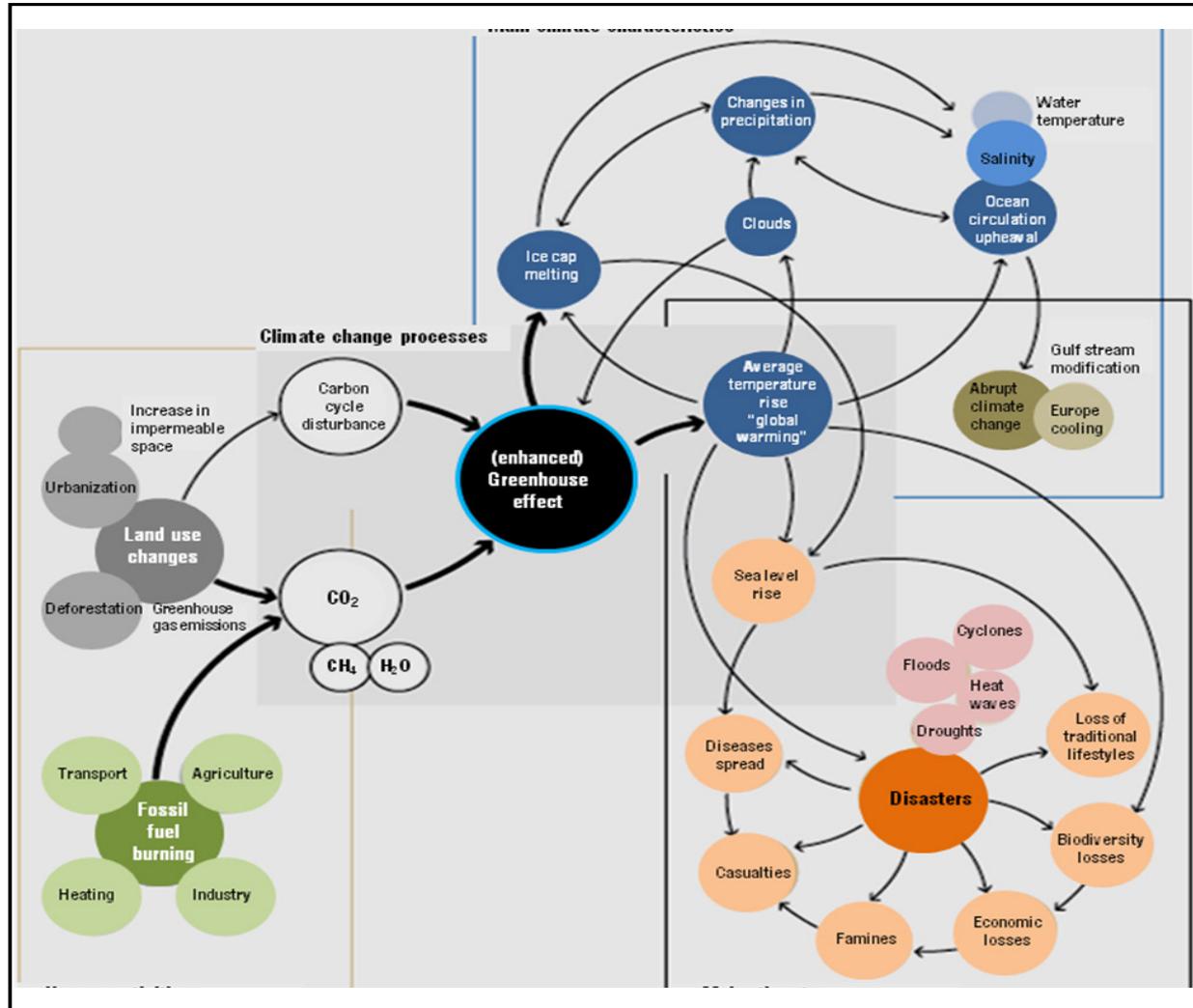
Source: IPCC, 2013



**Figure 2: Model of Annual Temperature Change 1950–2100**

**Source:** IPCC, 2013

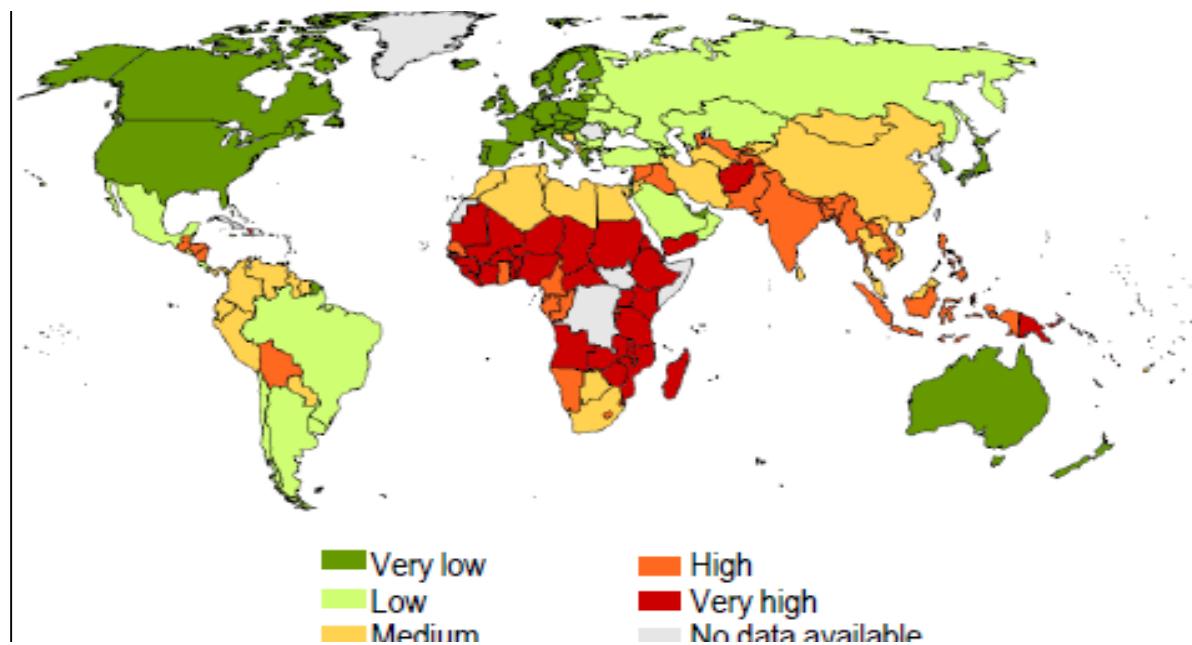
Several processes and activities drive climate change resulting to diverse impacts. The United Nations Framework Convention on Climate Change (UNFCCC) (2012) identified the major human activities driving climate change, the main climate characteristics affected and the impacts of the changes as captured in Figure 3.



**Figure 3: Climate Change Process**

**Source:** UNFCC (2012)

It is projected that present and future anticipated responses to climate change will be insufficient to stem the tide of extreme climate events and the catastrophic impacts of climate change on human livelihood and sustenance. Globally, the scale of the devastation caused by extreme weather events in recent years has intensified. However, because of their geographical location, reliance on climate-sensitive natural resources and development gaps in general, developing countries especially those in Africa are particularly vulnerable to climate change impacts (IMF, 2016). Africa is the world's second largest and most populous continent, with about 922 million people in 61 territories, it accounts for 14.2% of global population, over 20% of global climate-related disasters, 40% of the global poor, and 39 of the world's poorest countries. Consequently, Africa is vulnerable to climate disasters as illustrated in Figure 4.



**Figure 4: Global Vulnerability to Climate Disasters**

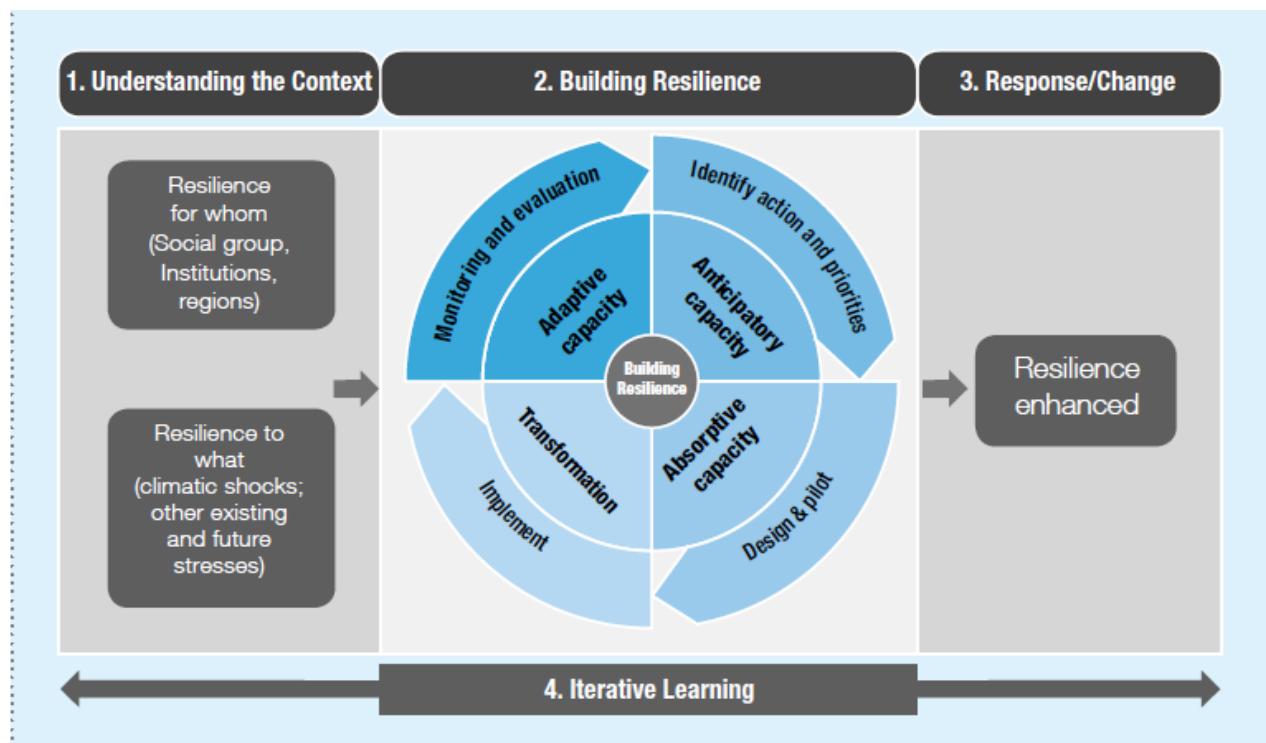
**Source:** IMF (2016)

In Nigeria, almost every key sector such as transportation, infrastructure, water, health, agriculture and tourism are sensitive and vulnerable to extreme weather events and climate change impacts (Sayne, 2011). The different ecological regions of Nigeria have attenuated severity of specific impacts. Coastal cities in Nigeria are increasingly vulnerable to intensifying coastal inundation and flooding of low-lying areas, while erosion from storm-water runoff is degrading considerable acreage of productive land in the hinterlands of southern Nigeria (FME, 2016). The northern regions of Nigeria are combating with severe drought, heat waves, and desertification accompanied with the southward plunge of the Sahara Desert. Generally, across the country there has been a rise in annual mean temperature and a troubling severity in rainfall intensity with a reduction in annual mean rainfall (Sayne, 2011; FME, 2016).

Efforts aimed at addressing climate change have been two-pronged, with mitigation on the one hand, and adaptation on the other. Mitigation involves curtailing the drivers of global warming and climate change while adaptation involves adapting to the present and anticipated impacts of climate change by strengthening response systems, infrastructure and communities. More recently, the resilience narrative emerged as an intervention approach to climate change that integrates both mitigation and adaptation measures (Smith, 2012). Resilience has been a key concept in the Paris Agreement on Climate Change, Sendai Framework for Disaster Risk Reduction, and the Sustainable Development Goals (SDGs) (ADB, 2014; IPCC, 2013; BRAC, 2020). Resilience within the context of climate change is a conceptual framework for

assessing system vulnerabilities to climate impacts and initiating mitigation measures as well as institutionalizing adaptation mechanisms (Meerow et al., 2016; McEvoy, 2019). Climate change resilience focuses on the development of new models for adaptive governance and policy based on flexibility, learning, experimenting and, ultimately transformation to build resilience at the individual, community and regional levels within a framework (Smith, 2012).

To develop a climate resilience framework (CRF), all relevant aspects should be taken into account to proffer adaptive measures embracing coherent, wide-ranging strategies and programmes involving a variety of complementary and mutually supporting interventions. A prominent climate resilient framework was proposed and implemented by Building Resources Across Communities (BRAC) (2020). The BRAC CRF (Figure 5) provides a conceptual framing for understanding context specific risks and vulnerabilities, identifying resilience enhancing strategies for uncertainties of climate change through collaborative action and implementation.



**Figure 5: BRAC Climate Resilience Framework for Synchronising Climate Actions**

**Source:** BRAC (2020)

The BRAC CRF begins with understanding the context of resilience for whom and resilience to what. This provides the pivot for the resilience building process which has four major components: adaptive capacity, anticipatory capacity, absorptive capacity and transformation. Iterative mechanisms revolve around these four resilience components which include to identify actions and priorities, pilot designs, implementation, as well as monitoring and evaluation. Each

of the four major components have multiple sub-components which contribute to enhancing resilience as illustrated in Figure 6.



**Figure 6: Four Major Components of Building Resilience**

**Source: BRAC (2020)**

Another significant pathway towards urban resilience is the Climate Resilience Framework (CRF) developed by Institute for Social and Environmental Transition (ISET) (Harrison et al., 2014). The ISET CRF is a conceptual planning approach to build climate resilience that clarifies complex sources of vulnerability and addresses the complexities of climate adaptation (MacClune et al., 2013). It is structured to build a broad understanding of resilience by describing the characteristics of urban systems, the agents (people and organizations) that depend on and manage those systems, institutions (laws, policies and cultural norms) that link systems and agents, and patterns of exposure to climate change. It operationalizes these concepts through structured iterative shared learning that aid local planners to define these factors in their own context to develop practical strategies for local action.

The ISET CRF comprises 4 main elements as shown in Figure 7. It is an iterative process that begins with inputs to the process at the bottom of the figure; a detailed assessment of vulnerability; and, a resilience building component—all facilitated through a shared learning process (Harrison et al., 2014). The resilience building process entails inputs of local knowledge, scientific knowledge, and a catalytic agent who initiates the process. The “catalytic agent” is

intended to be a broad, high capacity organization that can provide training and methodological support to local organizations that will directly engage local communities in the local language.



**Figure 7: The ISET Climate Resilience Framework**

**Source: Harrison et al. (2014)**

The left-hand loop of the ISET CRF provides an assessment metric to determine who and what is vulnerable, why they are vulnerable, and what factors hold that vulnerability in place through assessment of four key elements (MacClune et al., 2013). The first is systems comprising infrastructure and ecosystems, the second element are the social agents; and the third revolves around institutions comprising laws, policies and social norms, and the fourth, for each of the three preceding elements, the degree to which they are exposed to climate change hazards (Harrison et al., 2014). According to MacClune et al. (2013), within the ISET CRF, building resilience means:

- identifying the exposure of systems and agents to climate hazards;
- identifying and strengthening fragile systems by strengthening the characteristics that reduce their vulnerability to climate hazards;
- strengthening the capacities of agents to both access systems and develop adaptive responses; and,
- addressing the institutions that constrain effective responses to system fragility or undermine the ability to build agent capacity.

The right-hand loop of the Framework proffers possible adaptation or resilience building

actions to address the vulnerabilities identified in the left-hand loop. The iterative process includes identifying, designing, prioritizing, implementing, and monitoring actions. The CRF is implemented through Shared Learning Dialogues. Throughout the CRF planning process, the focus is on capacity building and utilizing pre-existing skills and knowledge, it can be implemented within existing development, institutional and legal frameworks (Harrison et al., 2014; BRAC, 2020).

### **Synopsis and Implications of Planning Laws and Policies on Climate Change Resilience in Nigeria**

Planning laws and regulations refer to an array of interrelated complementary statutory and administrative instruments, procedures and techniques designed to regulate, conserve, order, manage, and develop land in the overall public interest, and to control the character, appearance and arrangements of physical development to ensure economy, convenience and aesthetic appeal as well as to maintain standard practices (Aluko, 2011; NITP, 2014; Oladiti, et al., 2018).

Although there are few formal documentation of customary laws and practices prior to the advent of colonialism by the indigent constituents of Nigeria, available evidence reveal that during precolonial times, customary laws have existed which vary across the innumerable empires, city-states and localities guiding settlement planning. These unwritten laws influenced land use patterns, settlement planning as well as the construction and siting of dwellings which made these settlements resilient to the challenges they faced. Formal legislative planning frameworks through ordinances, proclamations, edicts and regulations began with the annexation of Lagos by the British and the enactment of the Lagos Town Planning Improvement Ordinance of 1863 borne out of the need to improve sanitation and health conditions (NITP, 2014).

A number of policies, planning laws and regulations were enacted after the 1863 Ordinance with direct import on climate change resilience (Omole and Akinbamijo, 2012; Aluko, 2011; NASPA-CCN, 2011; NPCC, 2013; NITP, 2014; Nachmany et al., 201, 2015; Oladiti, et al., 2018). The Cantonment Proclamation of 1904 led to the creation of European Reservation Areas. In pursuant of this, different planning standards were specified for these European Reservation Areas and the Native Areas. Physical planning and provision of infrastructure were concentrated in the European Reservation Areas to the neglect of the Native Areas. This proclamation was responsible for the segregation of many Nigerian townships creating the phenomena of divided cities witnessed till now. Ordinance No. 9 of 1914 was enacted for the purpose of compulsory acquisition of land by the government for public use which facilitated the provision of essential services and basic amenities such as schools and hospitals, as well as the establishment of Town Planning Committees. The Township Ordinance No. 29 of 1917 classified urban settlements in Nigeria hierarchically into first, second and third class townships. It also influenced the broad physical layout of towns and further entrenched segregation along ethnic colorations with

the segregation of Native areas into indigene and migrant areas. The Lagos Town Planning Ordinance of 1928 led to the establishment of the Lagos Executive Development Board (LEDB) in response to an outbreak of bubonic plague and was the first town planning ordinance in Nigeria, although it was limited to Lagos.

The Mineral Act of 1945 addressed issues relating to drainage and pollution on land, water, and air arising from extractive industrial activities and other related sources. The Town and Country Planning Ordinance No. 4 of 1946 was the first comprehensive town planning legislation for Nigeria and was modelled after the British 1936 Town and Country Planning Act. The principal focus of the ordinance was the improvements and control of development by means of planning schemes prepared by the planning authorities. This ordinance was in force with modifications in some instances, until 1992, with the enactment of the Nigerian Urban and Regional Planning Decree No.88 of 1992. The Public health law of 1957 was enacted to control overcrowding, diseases and urban squalor by controlling density and sanitation. The Land Development (Road) Law and Building Line Regulations of 1948 regulated the development of places of worship, acquisition, sale and disbursement of land for religious purposes.

Post-independence, the Land Use Decree of 1978 was promulgated essentially to remove the obvious serious inequality and insecurity associated with the land tenure system, to check land speculation, and ease the process of land acquisition by government for public use. It conferred the powers of land title on the governors of each state of the federation. The Ecological Fund was created in 1981 while the Ecological Fund Office was established in 1985. The Fund constitutes 1% of the Federation Account and it is known as Derivation and Ecology Fund with the prime objective to fund ecological projects to mitigate ecological problems.

The Federal Environmental Protection Agency (FEPA) Decree No. 58 of 1988 provided the legal framework for the implementation of the policies on environmental protection, natural resources conservation and sustainable development. It was aimed at integrating biological diversity considerations into national planning, policy and decision making as well as conserving and enhancing the sustainable use of Nigeria's biological diversity. The Nigerian Urban and Regional Planning Decree No. 88 of 1992 replaced the 1946 Town and Country Planning Ordinance as the overarching law on town planning in Nigeria. The law clearly defined the roles of the three tiers of government in the planning process.

The Federal Ministry of Environment (FME) was established in 1999. The initial Federal Environmental Protection Agency under the FEPA Act of 1988 was absorbed into the newly created ministry making it the highest policy making body on environmental matters in Nigeria.

The National Biofuel and Incentives Policy, was enacted in July 2007. The policy objective was to help develop the biofuel industry in order to gradually reduce dependence on imported

gasoline, reduce greenhouse gasses emissions while promoting economic development. Nigeria started to engage in Reducing Emissions from Deforestation and Forest Degradation (REDD+) in 2009 and entered into a partnership agreement with the United Nations REDD Programme in February 2010. The Nigeria REDD+ Readiness Programme foresees a twin-approach aimed at developing institutional and technical capacities at the federal level and carrying out intense institutional, strategy-building and demonstration activities at the state level.

Vision 20:2020 had a number of concrete climate and resilience related interventions and targets such as the establishment of a 1,500km Green Wall in 11 States bordering the Sahara Desert to reduce desertification. The National Agency for Great Green Wall was later established in 2015. Vision 2020 aimed to reduce climate change impacts on the environment and development processes through mechanisms that strengthen environmental governance, promote environmental education, and optimize economic benefits from sustainable environmental management. Concrete climate policy targets formulated under Vision 2020 were to:

- increase the share of the energy mix of hydro-power to 25% by 2013;
- increase wind energy capacity to 10MW by 2013;
- increase solar energy capacity to 10MW by 2013;
- increase biomass power generation capacity to 1,000 MW;
- increase forest cover from 6% to 10%; and
- reduce losses and impacts due to floods and drought by 10% by 2013.

The National Adaptation Strategy and Plan of Action on Climate Change for Nigeria (NASPA-CNN) was formulated in 2011. The Strategy outlines responses to climate change in key areas such as agriculture (crops and livestock), freshwater resources, coastal water resources and fisheries, forests, biodiversity, health and sanitation, human settlements and housing, energy, transportation and communications, industry and commerce, disaster, migration and security, livelihoods, vulnerable groups, and education. The National Climate Change Policy and Response Strategy (NCCP-RS) was formulated in 2012 with the aim to provide a framework for responding to climate change impacts such as increased flooding and rising sea levels.

The National Policy on Climate Change (NPCC) was adopted in October 2013. It is a strategic policy response to climate change that aims to foster low-carbon, high growth economic development path and build a climate-resilient society through the attainment of set targets. The plan explicitly identifies climate change as one of the major threats to economic development goals and food security. The vision of the NPCC is a climate change-resilient Nigeria ready for rapid and sustainable socio-economic development. Its mission is to strengthen national initiatives to adapt to and mitigate climate change and involve all sectors of society, including the poor and other vulnerable groups (women, youths, etc.) within the overall context of advancing sustainable socio-economic development. The Clean Technology Fund Investment Plan for Nigeria was initiated in July 2014 to contribute to national strategies for sustainable,

low carbon development and promotes scaled-up financing for demonstration, deployment and transfer of low-carbon technologies with significant potential for long-term greenhouse gas emissions savings. Focus areas include bus-based urban transit, renewable energy and energy efficiency, independent power producers, utility-scale solar PV deployment, and the promotion of a conducive environment for future investments in clean technologies.

Nigeria's National Adaptation Plan Framework was formulated in June 2020. The goal of the framework is to ultimately help to strengthen the resilience of Nigerians and thereby reduce their vulnerabilities to the actual and potential impacts of climate change. The key elements of the NAP process include:

- building appropriate capacity for adaptation action;
- defining adaptation options at the various levels of governance;
- creating an enabling environment for effective adaptation;
- designing a coherent approach to fund mobilization for apt climate change adaptation;
- developing suitable strategies for engaging the private sector;
- developing effective communication strategies in the various phases of the adaptation process; and
- developing an effective monitoring and evaluation plan to facilitate implementation.

Following the synopsis of the policy and legal framework for climate change resilience in Nigeria outlined above, it can be substantially asserted that the Nigerian Response to building climate change resilience has been underwhelming. The federal government in the most recent decades has not done much on climate change in terms of policy and legislation. Nigeria's First National Communication on Climate Change was put together in 2003, while it took another decade before the formulation of the National Policy on Climate Change in 2013. Although, there is really no dearth of policy and legislation, the major encumbrance is implementation. Within the climate resilience frameworks, the roles of institutions, the government and the people are pivotal to any successful outcome from the implementation of climate change resilience action plans. Both the BRAC and ISET CRF highlight the significance of institutions (laws, policies and cultural norms) to building resilience (Harrison et al., 2014; BRAC, 2020). Therefore, strong leadership, relationships, individual choices, and cooperation will decide much of how climate change and resilience building strategies play out together in Nigeria.

Nigeria has a complex federal structure, neopatrimonial leadership tendencies, low political accountability, and communications deficits, which inhibit the implementation of policies and enforcement of laws no matter how artfully crafted (Sayne, 2011). Many at times, existing planning legislations are partially implemented or not even implemented (NITP, 2014). Weak implementation of relevant planning legislations reinforced by endemic poverty is responsible for the proliferation of illegal land subdivision and the widespread incidence of informal settlements in Nigeria (Oladiti et al., 2018). Informality as an offshoot of unresponsive planning

legislations is a major encumbrance to climate change resilience in Nigeria because resilience is two-pronged, as it involves reducing vulnerability and improving adaptation both of which are hindered by the proliferation of informal settlements. The failure of planning legislations to address basic urban issues is attenuating global warming and climate change as well as inhibiting the resilience of urban dwellers to climate change shocks and stresses.

Nigeria has many public institutions that can contribute to the development of climate change resilience within existing legal and policy frameworks. These include the National Emergency Management Agency, the Nigerian Meteorological Agency, the National Environmental Standards and Regulations Enforcement Agency, the National Institute for Fresh-water Fisheries Research, the National Water Resources Institute, and the National Center for Arid Zone Studies, among others. The impediment is not the absence of institutions or legal frameworks but the underutilization and underdevelopment of most of these institutions. In addition, many of these institutions and agencies have overlapping, parallel and conflicting functions often times defeating the purpose of their establishment. Although a signatory to a number of international, regional, multilateral and bilateral agreements, conventions and memoranda, the implementation of these documents and policies is often bedeviled with a myriad of challenges in Nigeria. In reality most of these policies are visible only as documents but in practical reality are largely never implemented.

#### **4. Proposed Climate Change Resilience Framework for Nigeria within Existing Legal Frameworks**

Climate-resilient development is about adding considerations of climate variability and climate change to development decision-making in order to ensure that progress toward development goals now includes consideration of climate impacts (USAID, 2014). An adaptable framework for climate change resilience in Nigeria will adopt mechanisms from the ISET and BRAC CRF alongside considerations of the local peculiarities in line with existing institutional and legal frameworks. The proposed framework focuses on mainstreaming climate into existing planning and decision-making processes to achieve development goals via a development-first approach. The Federal Ministry of Environment has been at the forefront of Climate Change Resilience in Nigeria since its establishment in 1991. However, it is pertinent to note that, climate change resilience is a cross-cutting issue that involves other sectors of national development and MDAs such as Lands, Housing and Urban Development, Works and Transport, those saddled with extractive industries, mining and manufacturing, as well as education, health and the economy. Therefore an effective and responsive climate resilient framework for Nigeria has to recognize and integrate these sectorial constituents.

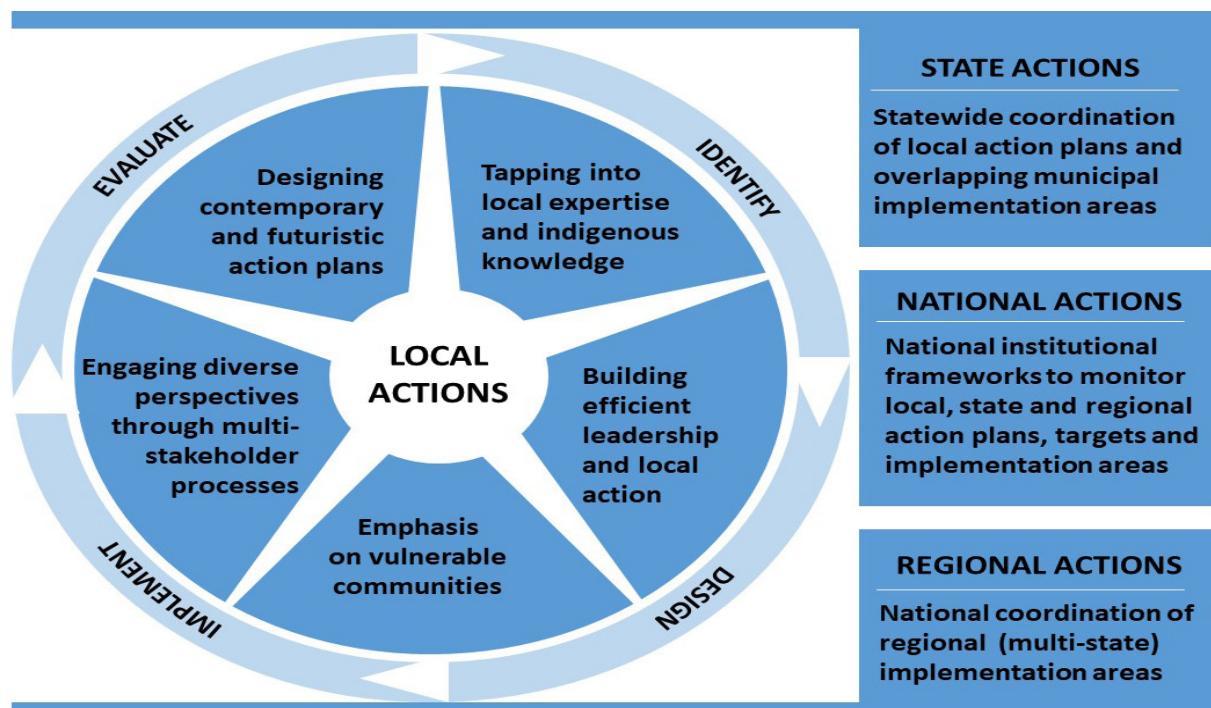
The NPCC (2013) identified six implementation areas which are:

- Communication and Awareness Creation;

- Capacity Building or Strengthening areas of Research, Technology Development and Transfer etc;
- Climate Change Governance and Institutional Framework;
- Financing NCCPRS Activities;
- International Cooperation; and
- Legal Framework.

It is no coincidence that two of these implementation areas revolve around institutional and legal frameworks which reinforces the need for a wholesome climate resilience framework for Nigeria backed with requisite legislation.

The federal system of government makes it almost impossible to have overarching national legislations without appropriate legislation by the constituent states. It is one of the reasons why implementation of national policies has been underwhelming. Therefore, the proposed climate resilient framework is conceptualized from the local level, before transiting to the state, regional and national levels in tandem with the existing levels of planning administration in Nigeria. There is no single action that will create resilient to climate change. Resilience is instead achieved through a number of actions, building upon each other over time. These actions would be enhanced and progressed as peoples and institutions learn from past experiences and apply it to future decisions. Therefore, it is proposed that climate resilience will be achieved following the process outlined in the proposed climate resilience framework for Nigeria illustrated in Figure 8.



**Figure 8: Proposed Climate Resilient Framework for Nigeria**

The CRF involve an iterative process which is implemented at the local level, co-ordinated at the state level and monitored at the federal level. In other words, local governments and municipalities with acreage beyond one local government are empowered to identify vulnerabilities and develop intervention mechanisms adopting the process in the CRF. Governance and institutions at the state level simply co-ordinate the action plans at the local level within a state-wide framework addressing collective objectives. The concerns at the federal level are basically oversight functions of monitoring resilience action plans and facilitating coordination across implementation areas that have regional or national coverage. The elements of the resilience building process in the CRF are outlined below.

#### **A. Tapping into local expertise and indigenous knowledge.**

Engaging local technical experts (researchers and academics), adapting indigenous knowledge-based solutions, local technological inputs and home grown measures facilitates intervention mechanisms and longer term capacity that can be scaled up to state, regional and national levels.

#### **B. Building efficient leadership and local action.**

Efforts to build resilience are most likely to be accelerated and sustained through strong leadership, driving commitment, and accountability with active community engagement to build awareness. Proficient leadership at the local level heightens local capacity for sustained action and transformation. In Nigeria's governance structure, the local government level presents the best opportunity to build resilience, thus, efficient leadership at the local level is expedient.

#### **C. Emphasis on vulnerable communities**

"Resilience to what" and "resilience for whom" are two key questions critical to building resilience. Target actions must identify who needs what, when and why. Identifying vulnerabilities and addressing people and communities collectively enhances climate resilience and helps to reduce pressures on the socio-ecological systems. It is essential to direct intervention measures to those who need it the most, to communities that are most vulnerable. The litmus test for a meaningful urban resilience approach is its relevance to the interests of poor or vulnerable households. While resilience measures must be provided at multiple levels, it is important to constantly ask "resilience for whom" to establish their practical value and to ensure that equity and equality concerns are kept at the heart of the climate resilience agenda.

#### D. Engaging diverse perspectives through multi-stakeholder processes.

Nigeria is fairly heterogeneous with varied socio-economic groups and interests. Engagement across different sectors (government, business, civil society, and academia) presents an incredible pedestal to drive transformative change. Sectorial considerations have influenced policy and legislation at the national level which hinder widespread acceptance in spite of whatever lofty ideas were subsumed in them. A multi-stakeholder resilience building process will harvest inputs from multispectral perspectives to build an infallible framework. There is also a need to understand how to best enlist stakeholders at different scales.

#### E. Designing contemporary and futuristic action plans.

Addressing the problems of today while embedding a long-term vision with an eye on the future will foster concrete transformation. The future is now, the choices of today affect the wellbeing of tomorrow. As enshrined in the sustainability paradigms, it is best to address uncertainties of climate impacts by looking beyond current challenges. Today's responses must not incapacitate the ability of future generations to respond to projected challenges. Resilience processes should address current needs but widen in scope to bring future scenarios into current decision making.

### 5. Conclusion

It has been empirically substantiated that substantial synergy exists between climate change resilience and responsive local, statewide and national planning legislations/policies encapsulated within the vital themes of the climate resilience framework. Unexpurgated importation of laws and regulations without requisite considerations to local, cultural and ethnic peculiarities inadvertently renders it ineffective, irrespective of how artfully crafted or holistic it may have been conceived. Without effective, locally driven climate change resilience action plans anchored upon a legal framework integrated by adaptive relevant local planning laws and regulations, significant drawbacks to regional or national resilience action plans implementation will emerge. In as much as it is pertinent to have overarching national planning legislations, it is equally if not significantly more expedient to have the domestication of these laws within local and statewide administrative and judicial contexts to address local/community peculiarities.

Besides, the impacts of climate change on the natural and socio-economic systems of the urban and rural fabric have a preponderance to be felt and responded to at the local and community levels since rights and resources are significantly unevenly distributed across the ecological zones of Nigeria. Likewise specific climate change impacts affecting the different ecological zones vary, therefore, resilience building processes and interventions have to be context specific in the light of immediate vulnerabilities. With diverse ethnic nationalities and heterogeneous conditions of the multifaceted clusters of constituent societies coupled with social, economic, political and

physical differences, a more localized and decentralized approach to climate change resilience is the only practical alternative in Nigeria. A successful climate change resilience framework for Nigeria will address the peculiarities of the Nigerian State and its multifarious constituents adopting a bottom-up approach with emphasis upon building resilience from the individual to the community level before widening the scope to local, state, regional and national levels. The climate resilience framework proposed provides an effective mechanism for resilience building in Nigeria in the face of current realities and future uncertainties addressing local peculiarities within existing legal and institutional frameworks.

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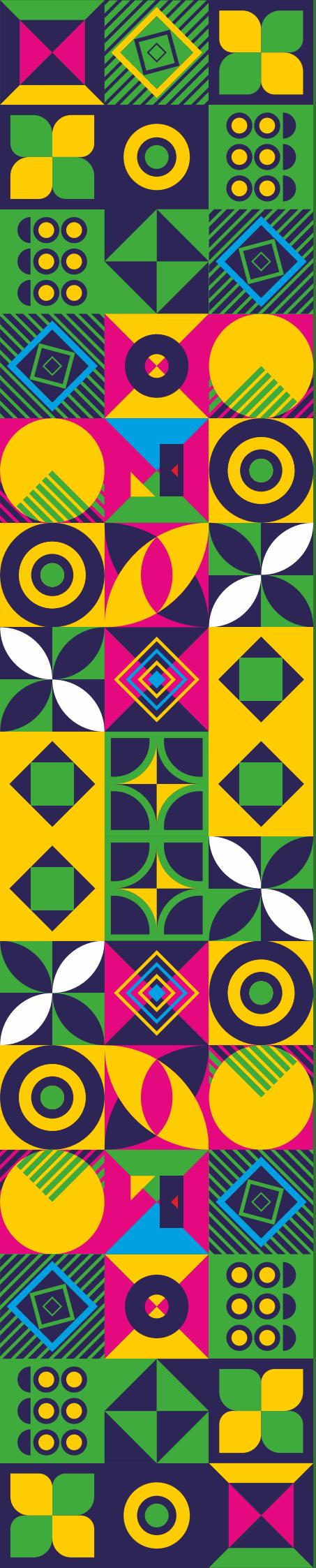
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## **SECTION THREE**

### **Actions Towards Realizing Sustainability of Nigerian Settlements**



# The Needed Approach: Reuniting Public Health and Urban Planning Practice in the Phase of Covid-19 Pandemic for Community Resilience

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### Abstract:

*The driving concept of public health, on germs theory; agent of infectious diseases provides public health practitioners role of cleaning up “bad dirt”. However, the emergence of COVID-19 pandemic changed the narratives of several public health safety elements that evolve from searching for metaphor of traditional immunization to guidelines and safety rules to a new paradigm. Thus the study examines the nexus; public health and planning practice in the core traditional areas of Bauchi with a view to reuniting public health and planning practice for community resilience. A mixed design was used, quantitative and qualitative data were collected to gain better knowledge. Study population were specialized professionals; Doctors, Nurses, Registered Town Planners and household heads. The sample size was purposively selected. Instrumentations were structured and unstructured questionnaires, observations and interviews were conducted. Descriptive and inferential statistics were used to analyse the data. The findings reveal increased risk of infectious disease and psychological disorder on the fear of outbreak among the residents of the traditional area of Bauchi town with a wide range of perception on public health consequences. The study recommends training planners and public health professionals with modern skills to cross boundaries and work with groups other than their own.*

**Key Words:** Public Health; Urban Planning; COVID-19



## Pandemic; Community Resilience

### Introduction

Across the globe, COVID-19 pandemic took its roots in the cities and proven to be the single most potent disruptive force to the “engines of economic growth (Liu & Su, 2020). This have further exposed the fragility of urban systems like never before (Zohreh, 2020), marking the year 2020, the year with one of the biggest public health crises of all time, threatened and took away millions of lives; instigated a massive economic crisis; triggering further negative consequences for human life, wellbeing and lifestyle. Apart of the historical plagues (Klaus, 2020) reported that, COVID-19 instituted urban crisis, forcing authorities to reconsider the deeply held beliefs about good city form and the purpose of planning. Countries all over the world faced with unprecedented challenges and uncertainty because Millions of urban residents in developing countries have been vulnerable to contagious diseases both at home and in public places due to over-crowding, lack of infrastructure, and poor sanitary conditions (Lall & Wahba, 2020; Wasdari & Prasad, 2020). The global urban environment is under spotlight of public health and social measures watch list (WHO, 2020). Public health and social measures (PHSMs) are measures or actions by individuals, institutions, communities, local and national governments and international bodies to slow or stop the spread of an infectious disease, such as COVID-19 (WHO, 2020). This clarion call has awaken different professionals to rise an eyebrows toward resilient approach identified as a global technical approach of solving environmental health challenges (UN-HABITAT, 2021).

The paradigm resurrected interest to merge urban planning and public health practice toward resilience communities to pandemic, such as COVID-19. Long before, history has it that, there is a foundation of urban planning and public health practice to space, safety and control of the environment. The belief is that, environment takes care of everything (WHO, 1999). This was present in the distant past and is still with us. In order to understand the connection between the two disciplines better, it is important to gain insight into the *new* public health paradigm and its theoretical underpinnings.

WHO defines health as “*a state of complete physical, mental and social well-being*” and urban planning plays an important role in determining the health of urban populations but this nexus is often undervalued or ignored (Louis, 2020). The field of medicine has expanded over the years to include professionals with knowledge of the urban system (gold, 2020). This is not living urban planning profession out, because history has it that urban planning provide insight into the past and, more importantly into the future. The lessons of the past can be employed today in determining the health of urban populations but this relationship is often undervalued or ignored (Louise, 2020).

The COVID-19 crises is perhaps an appropriate juncture for ‘health’ professionals to consider a new tenet in the context of urban planning. Urban planning plays significant role in improving many health outcomes through their planning decisions visa-a-viz reknit of social, economic and cultural fabric that has already been frayed and torn by the COVID-19 pandemic globally.

The widespread practice of planning in the contemporary world (most of which is designed to some extent) “from the details of daily objects to cities, landscapes, nations, cultures, bodies, genes, and … nature itself” (Latour 2008, p. 2). The Covid-19 safety regulations such as: Introduce measures to keep a distance of at least 1 metre between people and avoid direct physical contact with other persons (i.e. hugging, touching, shaking hands), strict control over external access, queue management (marking on the floor, barriers); Reduce density of people in the building (no more than 1 person per every 10 square metres), physical spacing at least 1 metre apart for work stations and common spaces, such as entrances/exits, lifts, pantries/canteens, stairs, where congregation or queuing of employees or visitors/clients might occur; Minimize the need for physical meetings, e.g. by using teleconferencing facilities; Avoid crowding by staggering working hours to reduce congregation of employees at common spaces such as entrances or exits; Implement or enhance shift or split-team arrangements, or teleworking; Defer or suspend workplace events that involve close and prolonged contact among participants, including social gatherings. To an extent in urban planning perspective may be described as a form of ‘spatial medicine’.

The term medicine, etymologically derived from the Latin ‘*medeor*’ meaning a ‘*healing art*’, fits urban planning practices both as an art and a science because urban planning practices contribute as a ‘healing art’(louis,2020). As the field of medicine moving away from prescribing pills, towards ‘social prescription’ and ‘nature prescription’ directing people to undertake restorative activities or engage with the natural world in order to improve their health. The contemporary Healthy urban planning practices is a form of ‘spatial prescription’ whereby designs of urban system are actively and systematically aim to create healthier urban environments in which societies’ and individuals’ wellbeing flourishes. Based on utopianism, idealism, symbolism and the expression of authority (WHO, 1999), on the need of corrective measures due to natural disasters, human health hazards and the need to circulate goods and people throughout an urban area.

Urban planners are professionals that are accurate in creating new built environments and are involved in modifying, retrofitting and regenerating existing urban areas, as such they hold a unique position to improve public health in a number of ways (Marsh et al. 2020). The expertise, competences, capacity and creativity of urban planners will provide a potential roadmap for innovative, experimental and radical approaches in enabling healthier urban lifestyles.

### 1.1.1 Environmental Mode of Infectious Diseases Transmission

History has it that there is correlation between environment and transmissions of infectious diseases via overcrowding of people, poor housing, insufficient supply of fresh water, poor sanitation facilities, and ineffective ventilation systems (WHO, 2020). The pandemics of the 20th and 21st century, in the Western World, have been and are mostly transmitted by direct contact with body fluids (AIDS, Ebola) or through respiratory (pandemic influenza, SARS-COV-2, MERS) contact, differently from the past, when oral-faecal (Cholera) or vectors (Malaria, Plague) routes were predominant (Stefano, et.al., 2020). The latter are made less likely by the increase of the level of personal, domestic and urban hygiene, while the former are favoured by the urban and residential density, via the increment and crowding of meeting spaces, visa-a-viz the congestion of people in public places such as markets worship centres, transport such as road, undergrounds and suburban trains as well as ceremonies. Also social inequalities that, in turn, are associated with poor housing and precarious life conditions aid the spread of infectious diseases and It's, therefore, clearly possible that the environmental phenomena aids the spread of infectious diseases and viruses like SARS-COV-2 and recent pandemic covid-19 (Wu, et.al., 2020).

### 1.1.2 Relationship of Public Health and Physical Planning Practice

Planners of mid-nineteenth century cities were public health workers and what we today call urban planners (WHO, 1999). Their main objectives were functionality and public health through removal of unsanitary conditions and city beautification to improved hygiene, social progress and increased efficiency (Mumford, 1961). In the early 1900s, Geddes concept of de-congesting large metropolis (Hall, 1996), was principally to have ecological balance and resource renewal, with a view to promote health for all and a sustainable development (O'hanlon & Hamnett, 2009).

Various studies revealed that Public health has never been one to have its own theory, rather borrows from other disciplines (ISOCARP, 2020). The link between urban planning and public health is anchored on three philosophies: the social justice, political-economic and environmental theories, as an evidence of the interconnectedness (WHO, 1999). The social justice is founded on the notion of shared responsibility and a strong obligation to the collective good. It also heeds the reality of unequal starting positions; everyone is *not* born equal and focuses on social conditions and assured benefits (e.g. housing, education and safety) to public health, this places the focus on controlling hazards and changing the environment to prevent disability and premature death through organized collective action (Wallack, 1997). Political economy is founded on the role of history and the state in influencing health. It emphasizes how the structure of the economy and society affects the lives of individuals, because it is an outermost force in a set of forces that affect the health of individuals (Minkler, 1995). The

understanding is that resources are not allocated equally across the board; rather they are distributed according to power. This allows for a comprehensive exploration of the impact of age, race, class, sexuality and gender on the health of communities. Concepts of environmental theory focus on the physical and social constructs of communities. The theory holds that significant numbers of diseases are caused by toxins in the environment, and implies that disease prevention, instead of requiring individual personal changes or medical treatments, demands changes in our surrounding environments (Tesh, 1990), *visa-a-viz* social organization under which people live.

The aforementioned concepts and theoretical orientations provide the foundation of basic understanding of how public health and urban planning intersect (WHO, 1999). To the fact that physical and social environments play major roles in the health of communities, planning profession rationales focus and revolve around design and creation of sound places for people, which are intrinsically linked. That is, urban planning can and does serve as a form of primary prevention and contributor to health outcomes. Additionally, it sheds light on how a *holistic* approach to building cities is key. public health professionals have become increasingly aware that an effective public health response take a broad, community-wide perspective that focuses on prevention over treatment and avoids “blaming the victim” by recognizing the pervasive influence that the environment has over behaviour.

The traditional aspects of health that influence urban planning in the past and the present evolved from the need to control disease (Mumford, 1961). The conditions in new industrial towns in the nineteenth century were deplorable. Basic services such as adequate housing and safety were non-existent Industrial workers lived in overcrowded conditions with no exposure to daylight or ventilation Under such conditions, diseases such as typhus, cholera, yellow fever and tuberculosis flourished, creating severe losses in both human and economic terms (McKeown, 1965). To control the diseases was to restore city fresh air, pure water, open space and ventilation which Served as the foundation for disease control through urban planning-related initiatives such as sewerage, garbage collection, rodent control and mosquito abatement.

## 2.1 Statement of the Research Problem

The crisis of COVID-19 pandemic brought recession hangs over world economy and that mean the heaviest burden has fallen on the lower socio-economic groups of each society, in more or in less developed nations. World health organization (WHO) and Public health officials in many affected countries, especially Nigeria kept advising people to stay home and minimise contact or maintain social distancing with others. However, such quarantines mechanism proved difficult for people that hustle for a daily meal and have no reliable incomes. Observation has shown that, it is virtually impossible for people in Nigeria especially Bauchi the study area living in crowded traditional wall city to abide by the rule. Bradly and Daniel (2020) reported that

high density areas are perceived to be at risk if the pandemic sustains beyond year. Researchers kept raising questions what will be the impact of COVID-19 in inner cities and outer cities slums and in informal settlements that suffer inequalities and vulnerabilities? Will it be a “Bad City Planning” that will make “the Coronavirus crisis to worsen?” or will it be density and clustering, that can make residents more vulnerable to the disease (Zohreh, 2020)? In the developed countries Haussman model was of key importance. It focused on the removal of unsanitary conditions and duel on city beautification. Its main objectives were functionality and public health (WHO, 1999). Little the desired research gap exist in the context of Bauchi, Nigeria. However, The COVID-19 pandemic crisis have confirms re-awakening of urban planning knowledge not only a discipline related to physical aspects of a city but has a role to generate a situation to enhance, consolidate and integrate duties, decisions and actions of different professionals towards dealing with urban public health problems that can be solved under a unique integrated framework this is in affirmation to Honey-Roses *et al.* (2020), reported that perhaps normalcy may return with some modification in urban planning and preparedness. Thus, this study examines public health and planning practice in the phase of COVID-19 Pandemic in the core traditional area of Bauchi. Specifically, the study focuses on identifying strictly observed adherence to COVID-19 Protocol by the households heads in the traditional area of Bauchi; To examine physical planning within the traditional area of Bauchi; To determine level of adherence to public health practices by households in the traditional areas of Bauchi and to determine relationship between physical planning and public health practices in the traditional area of Bauchi with a view of the risk of infection disease outbreaks

#### 4.1 Research Methodology

This study used explorative and descriptive research approach. Explore various literature and primary data. As such a mixed design was used i.e. quantitative and qualitative data were collected. This is due to the heterogeneous nature of population comprising household heads and specialized professionals; town planners, doctors, nurses and community health workers. These set of professionals conform to Chitkara's (2012), who reported that professional is a person (s) atleast registered with body of proffesion with requisite qualification or its equivalent. A sample size of 235 household heads was established using Krejcie and Morgan (1970) table of determining sample size. Hence 235 questionnaires were administered to the household heads respondents. Similarly professionals were interviewed this include: 5 Doctors specialized in community medicine, 15 Nurses and Community Health Workers and 5 TOPREC members using disproportional purposive sampling technique. The heterogeneous population and the uneven distribution of the study population inform the adoption of disproportionate purposive sampling technique. 230 copies of a questionnaire were returned with a 96% response rate. The data were analysed using both descriptive and inferential statistics. The descriptive statistics involved the use of frequency and percentages while inferential statistics was Spearman rank-order correlation coefficient.

## 5.1 Results and Discussion

Table 1: Household Heads Adherence to COVID-19 Protocol in the Traditional Area of Bauchi.

In response to the COVID-19 across the globe, many countries implemented a range of public health and social measure to reduce the threat. These include lockdown, social distancing, wearing of face mask in public places, regular hand washing, covering of mouth while sneezing or coughing, disinfecting surfaces and observing self-isolation when in contact with symptomatic patient.

In the traditional area of Bauchi, the findings reveal that, 88% of the households did not adhere to the lockdown measures. Rather goes around perhaps for hustles. Seven (7) % partially adhered to, and only 5% adhered. Similarly 96% not adhered to social distancing in the places of markets, worships, and burials only 4% partially adhered to. For the wearing of face mask, 12% strictly adhered, 40% adhered, 51% partially adhered and 49% not adhered. Regular hand washing, 5% strictly adhered, 23% adhered, 33% partially adhered and 37% not adhered. Covering of mouth while sneezing or coughing, 19% strictly adhered perhaps a long traditional norm, 24% adhered. Only 23% not adhered and 26% partial adherence. Disinfection of surfaces 73% not adhered 15% partial adhered, and only 9% and 3% adhered and strictly adhered to respectively. Self-isolation when in contact with symptomatic patient, 93% did not adhered. Perhaps they have not come in contact with symptomatic patient since there was no testing. This implied that households seriously violated COVID-19 protocol in the traditional area of Bauchi in the phase of the pandemic, despite the threat and sanctions by the government.

**Table 1: Household Heads Adherence to COVID-19 Protocol in the Traditional Area of Bauchi**

S/N	COVID-19 Protocol	Household heads adherence to COVID-19 Protocol							
		NT AD		P AD		AD		ST AD	
		Freq.	%	Freq.	%	Freq.	%	Freq.	%
1	Lockdown	203	88	16	7	11	5	0	0
2	Social Distancing	221	96	9	4	0	0	0	0
3	Wearing of Face Mask in Public	112	49	51	22	40	17	27	12
4	Hand Washing	89	37	76	33	53	25	12	5
5	Covering Mouth, Sneezing or Coughing	54	23	62	27	70	30	44	19
6	Disinfecting Surfaces	168	73	34	15	20	9	8	3
7	Self-isolation	214	93	12	5	2	1	2	1

**Note:** NT AD not adhered; P AD partially adhered; AD adhered; ST AD strictly adhered

Table 2: Nature of physical planning in the traditional area of Bauchi. The study finding reveals that 82% of the respondents are not satisfactory with plots sizes of residential development. Perhaps due to the nature of the built environment, the over-crowding of people visa-a-viz the poor housing conditions and the ineffective ventilation systems that have multiple risk of the spread of infectious disease such as COVID-19. Similarly 60% are not satisfactory with neighbourhood area and its services radius. While site and access to facilities and services such as schools and health institutions 67% are partially satisfactory. Spaces for recreation 43% of respondents are satisfactory with it. Neighbourhood access and foot paths 79% are partially satisfactory with the condition. While organization and orderliness of structures and spaces 80% are not satisfactory with the condition, sanitary condition and sewerage system within the traditional area of Bauchi 68% are not satisfactory. Prevailing social interaction during COVID-19 pandemic in spaces 61% are not satisfactory. Safe and sanitary means of sewerage, garbage disposal 85% are not satisfactory with the condition. This implies that traditional area of Bauchi lacks adequately plan.

**Table 2: Physical Planning in the Traditional Area of Bauchi**

S/N	Examined Physical Planning Variables	% Response	Remarks
1	Plots size of residential development	82	Not Satisfactory
2	Neighbourhood area and its services radius	60	Not Satisfactory
3	Site and access to facilities and services	67	Partially Satis
4	Spaces for recreation activities	43	Satisfactory
5	Neighbourhood access roads/foot path	79	Partially Satis
6	Organization/orderliness of structure and spaces	80	Not Satisfactory
7	Sanitary & sewerage system within the neighbourhood	68	Not Satisfactory
8	Prevailing social interaction during COVID-19 pandemic in spaces	61	Not Satisfactory
9	Safe & sanitary means of sewerage, garbage disposal	85	Not Satisfactory

Table 3: adherence to public health measures in the traditional area of Bauchi. The findings reveals that 78% of respondents are not satisfactory with sanitation and environmental hygiene conditions of households in the traditional area of Bauchi. Similarly 65% are partially satisfactory

with safely management of drinking water sources. Also 82% are partially satisfactory with the cleanliness of social interaction spaces with the neighbourhood. However, 58% are very much disturbed with noxious and offensive odours in the area perhaps from the drainages and sewage systems. Similarly, 78% are also very much disturbed with open defaecation within the neighbourhood. To the prevailing crowds and chances of infected with contagious diseases in the case of outbreak 87% reported that the chances is very high. To the behavioural attitude of the households in traditional area of Bauchi, to measures in place to reduce risks in the event of outbreaks of disease, 64% reported that they are not satisfactory with individuals and the general people's behaviour toward measures in the events of outbreak. With the level of community preparedness to diseases outbreak 78% reported the community have none existence measure, perhaps with the belief that it is the almighty God that's protect. To surveillance, monitoring and reporting of outbreak in the community 65% reported that the measure put in place by government is not effective.

**Table 3: Adherence to Public Health Practices in the Traditional Area of Bauchi**

S/N	Public Health of concerned variables	% Response	Remarks
1	Sanitation & environmental hygiene of households	78 %	Not satisfactory
2	Ways of safely managing drinking water sources	65%	Partially satisfactory
3	Cleanliness of social interaction spaces	82%	Partially satisfactory
4	Noxious and offensive odours	58%	Very much disturbing
5	Littered waste	71%	Very much disturbing
6	Open defaecation	62%	Very much disturbing
7	Prevailing crowds & chances of contagious infections	87%	Very high
8	Behaviors to reduces risk of infection disease outbreaks	64%	Not satisfactory
9	Level of community preparedness to outbreaks	78%	None existence
10	Availability of environmental sources of pathogens	65%	All over
11	Surveillance, monitoring & reporting of an outbreaks	67%	Not effective

Table 4: shows the correlation of planning and public health measures in the traditional area of Bauchi toward reduction of an outbreak. A spearman's rank correlation was used to determine the relationship between variables of public health practices and physical planning. The result reveals that the significant spearman correlation coefficient value is .000 that confirms apparently that, it appears to be no correlation between public health measures and physical planning measures. Implying that there is no positive monotonic correlation between public health and physical planning measure in place in the traditional area of Bauchi toward reduction of an outbreak, Since  $rs = .000$ ,  $n = 21$ ,  $p < 1.000$

**Table: 4 Correlation of Planning and Public Health Practices toward Reduction of Infectious Disease Outbreak in Traditional Area of Bauchi**

	Inference		PHP	PPP
Spearman's rho	Public health practice	Correlation. Coef.	.000	.000
		Sig. (2-tail)	.000	.000
		N	21	21
	Physical planning practice.	Correlation. Coef.	.000	1.000
		Sig. (2-tail)	.000	.000
		N	21	21

Note: PHP public health practice, PPP physical planning practice

## 6.1 Conclusion and Recommendation

Despite proliferation of public health, physical planning institutions and regulations over the past years, COVID-19 pandemic has demonstrated that many nation and cities in the developing countries especially Nigeria and Bauchi in particular are ill-prepared to confront this challenge visa-a-viz space, safety and control of the environment. Understanding that, history has it, infectious diseases are transmitted majorly via the environment, and it is evident that public health and urban planning fields are undeniably linked. However, the findings in the traditional area of Bauchi revealed that there is an increased risk to outbreak of diseases especially COVID-19, resulting from non strictly adherence to COVID-19 protocol, nature of physical panning and the prevailing social interaction during the pandemic in spaces and poor adherence to public health practices in the households and the community at large. These has risen concern and giving individuals and the community at large a psychological disorder on the fear of outbreak among the residents of the traditional area of Bauchi town, with a perception of wide range of consequences on the general public health. Therefore this study recommend that, planners and public health professionals need to be train with modern skills to cross boundaries and work with groups other than their own in designing and control environment.

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# Corona Virus Pandemic in Nigeria: Building Resilient Cities

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### Abstract

*The study assessed the need for urban planning to anticipate future developments and prepare planning scheme in order to decongest towns and cities in the wake of the Corona Virus Disease (Covid-19) novel pandemic. Basically, the study explored options and standards that can be useful in urban planning in order to help towns and cities recover from the shock of the pandemic in Nigeria. However, the study relied on secondary data. Data were basically obtained from the National Centre for Disease Control (NCDC). The study observed that Covid-19 had eaten deep into the social and economic lives of urban residents and has affected urban sustainability to a large extent. The study showed that there has been a variation in the living condition of urban residents since the corona virus pandemic occurred. However, community recovery was observed to be tied to timely development of facilities in cities that will have direct effect on the lives of urban residents. Equally, recovery has to be centered on ensuring public and regular sanitation in urban areas. It was concluded that infrastructure be provided in cities so as to facilitate recovery from the novel disease.*

### Introduction

The Corona Virus disease which is otherwise known as Covid-19 became a pandemic across the globe in 2020. The disease was reported to have stated in Wuhan, China. Within a very short

time, the novel disease spread across China and entered other countries. However, the disease has become a very serious emergency that has infected over 150,000 people over the years (Callaway, 2020). It has equally killed many people across the globe. Before the end of 2020, Covid-19 had affected 216 countries with 34,481,669 confirmed cases, 1,027,653 confirmed deaths and 25,670,615 recoveries (World Health Organization (WHO, 2020a). The disease has no known cure.

According to WHO (2020), the symptoms of Covid-19 include fever, cough, respiratory symptoms, shortness of breath and general breathing difficulties. In severe cases, the symptoms include lower respiratory tract illness, pneumonia and bronchitis, acute respiratory distress syndrome and severe acute respiratory syndrome (WHO, 2020). With an estimated mortality rate of 3.41 percent globally, the disease has more negative impact on the elderly and those with underlying health conditions (Ohia, Bakarey and Ahmed, 2020).

In Africa, the corona virus disease has spread virtually to all countries. Given the commercial nature of China together with its ties with the African region, it is difficult to prevent the spread of the disease within the African region. Therefore, the disease has killed a total of 128,950 person in Africa (WHO, 2021). The effect of the virus apart from directly leading to death within the continent has also affected the general economy of the African region and has equally unveiled negative implications on the social lives of the residents of the continents (Bakare, Oladimeji and Gbadamosi, 2020).

Nigeria with the highest population in Africa has recorded 166,650 confirmed cases with 4,515 active cases and 159,946 discharged cases. Available studies (Bakare *et al.*, 2020; Ohia *et al.*, 2020 and Musa *et al.*, 2020) have reported that the country is yet to recover from the shock caused by the virus. In order to seek for measures for recovery, attention should be turned to strategies that will help people to bounce back from losses occasioned by the virus. Also, resilience measures the persistence of a system to be able to maintain relationships between populations after experiencing changes and disturbances (Musa *et al.*, 2020). However, resilience has been used in explaining the complexities of socio-ecological systems and the role of human agency in coping and adapting to complex situations in the long-term. The pandemic had affected Nigeria from all spheres hence, there is need to appraise options for community resilience through the development of settlements. This paper seeks to examine available policies for the development of resident towns that will help in containing the virus.

## 2. The Issue

In December 2019, the World Health Organization received reports on clusters of pneumonia cases of unknown causes in Wuhan City, Hubei Province of China. At this stage, Chinese authorities identified a novel strain of Coronavirus (SARS-COV 2) as the causative agent.

Continuous assessment of the disease led to the advice of the International Health Regulation Emergency Committee for the disease to be regarded as an epidemic. The disease spread fast to other countries and as such, became a pandemic. On 30th January 2020, the Director-General of the WHO declared the COVID19 outbreak as a Public Health Emergency of International Concern (PHEIC) and was later accepted as a pandemic on 11 March 2020 (WHO, 2020).

At the global level, over 2.6 million confirmed cases had occurred and there are over 186,000 deaths recorded before the end of 2020 (Worldometer, 2020). Currently, a total of 172,657,442 has been confirmed globally with 3,711,013 deaths and 155,382,981 recoveries. Asia has recorded 44,947,054 cases with the five countries reporting most cases being India (28,047,534), Iran (2,893,218), Indonesia (1,816,041), Philippines (1,223,627) and Iraq (1,197,082). In America, 67,895,582 cases were recorded with five countries, United States (33,259,571), Brazil (16,471,600), Argentina (3,781,721), Colombia (3,406,456) and Mexico (2,413,742) reporting most cases. In Europe, a total of 53,294,291 cases have been confirmed with five countries reporting most cases being France (5,666,113), Turkey (5,242,911), Russia (5,071,917), United Kingdom (4,484,056) and Italy (4,216,003) while Oceania with 76,463 cases and most cases reported in Australia (30,098), French Polynesia (18,860), Papua New Guinea (15,848), Guam (8,156) and New Zealand (2,317); and 705 cases have been reported from an international conveyance in Japan (European Centre for Disease Prevention and Control, 2021). In Africa, the first case of the virus was confirmed in Egypt in February 2020. Accordingly Africa has recorded 4,835,646 cases and the five countries that reported are South Africa (1,662,825), Morocco (519,108), Tunisia (345,474), Ethiopia (271,345) and Egypt (261,666).

In terms of death rate, Africa has recorded 130,399 deaths with the five countries reporting most deaths being South Africa (56,439), Egypt (15,047), Tunisia (12,654), Morocco (9,143) and Ethiopia (4,155). In Asia, death rate was 624 255 with the five countries reporting most deaths being India (329,100), Iran (79,741), Indonesia (50,404), Philippines (20,860) and Pakistan (20,779). America had recorded 1,659,173 with the five countries reporting most deaths being United States (594,431), Brazil (461,057), Mexico (223,568), Colombia (88,774) and Argentina (78,093). While Europe had recorded 1,134,485 deaths with the five countries reporting the most deaths—United Kingdom (127,781), Italy (126,046), Russia (121,501), France (109,431) and Germany (88,442). Oceania with 1,392 has the five countries reporting most deaths being Australia (910), Papua New Guinea (162), French Polynesia (142), Guam (139) and New Zealand (26) and 6 deaths have been reported from an international conveyance in Japan ((European Centre for Disease Prevention and Control, 2021)). Globally, as of 12:27pm CEST, 3 June 2021, there have been 171,222,477 confirmed cases of COVID-19, 3,686,142 deaths, reported to WHO. As of 2nd June 2021, a total of 1,581,509,628 vaccine doses have been administered. By 3rd June 2021, vaccine doses that have been administered increased to 1,581,509,628 (WHO, 2021).

In Nigeria, the virus has been spreading. The index case was confirmed in Lagos State on the 27th February 2020. The case involved a 44-year old man, an Italian citizen, who returned from Milan, Italy on 24 February; 2020 (NCDC, 2020). The NCDC reported that 216 people had contacts with the index case. From the follow up, of the 216 contacts, 45 persons travelled out of Nigeria and one of the contacts was confirmed to be positive for COVID-19 on 9 March 2020 (NCDC, 2020b). Over time, the virus has continued to increase its level of transmission in the country. Table 1 shows the number of confirmed cases of the corona virus in Nigeria as of Thursday 6:44 pm 3 June, 2021.

**Table 1: Confirmed Cases of Corona Virus across the States in Nigeria**

States	Confirmed (Lab) cases	Cases on admission	No. Discharged	No of Deaths
Lagos	59,057	1,628	56,990	439
FCT	19,868	592	19,110	166
Kaduna	9,089	21	9,003	65
Plateau	9,063	1	9,005	57
Rivers	7,269	55	7,113	101
Oyo	6,856	1	6,731	124
Edo	4,908	3	4,720	185
Ogun	4,683	3	4,630	50
Kano	3,989	21	3,858	110
Ondo	3,311	28	3,219	64
Kwara	3,129	6	3,068	55
Delta	2,627	812	1,744	71
Osun	2,578	6	2,520	52
Enugu	2,464	200	2,235	29
Nasarawa	2,383	0	2,344	39
Katsina	2,103	17	2,052	34
Gombe	2,053	17	1,992	44

Ebonyi	2,037	40	1,965	32
Anambra	1,909	64	1,826	19
AkwaIbom	1,909	16	1,875	18
Abia	1,693	2	1,669	22
Imo	1,657	2	1,618	37
Bauchi	1,549	14	1,518	17
Benue	1,366	751	591	24
Borno	1,337	99	1,200	38
Adamawa	1,130	12	1,086	32
Taraba	1,001	0	977	24
Niger	935	5	913	17
Bayelsa	888	7	855	26
Ekiti	875	2	862	11
Sokoto	775	0	747	28
Jigawa	532	4	512	16
Kebbi	450	42	392	16
Yobe	444	41	394	9
Cross River	394	0	376	18
Zamfara	244	3	233	8
Kogi	5	0	3	2

Source: National Centre for Disease Control (2021)

From the regional distribution presented in Table 1, it is clear that regions with more economic and social activities tend to be more affected. This is because the extent to which people move and interact is more. It is therefore useful to plan for resilience if activities in these regions are to coexist in harmony while minimizing the spread of the virus.

### 3. The Link Between Covid-19, Cities and Planning: A Review

Land and people are the two most important aspect of development. Sharifi and Garmsir (2020) observed that the Covid-19 pandemic had affected cities and planning. For instance, there is concentration of people and economic activities in cities. Obviously, the coming together of people (population and economic activities) becomes hotspots of Covid-19 infections. Sharifi and Garmsir created a link between Covid-19 and cities using four major themes. The theme are; environmental quality, socio-economic impacts, management and governance, and transportation/urban design. They were of the view that environmental quality cover issues such as air quality, meteorological parameters, and water quality. Therefore, they recommended for sustainable socio-economic factors, urban management and governance, and transportation/urban design that should be used for post-Covid urban planning and design.

In a similar study, Afrin, Chowdhury and Rahman (2021) noted that the scientific community has been continuously trying to assess the virus, its socio-environmental impacts, regulatory/adaptation policies, and plans. Their study suggested that the best way to tackle the pandemic is to develop pandemic-resilient city planning and management strategies in order to contain the infectious diseases during Covid-19. They cited such developments to include the reframing of unsustainable urban patterns, hazards, and social inequalities to be prepared for the emerging cases. Afrin et al., (2021) further assessed disaster risk management options that will help in developing pandemic-resilient urban strategies (response, mitigation, and preparedness phase). They called for the implementation the smart and resilient city design and policies that will identify disease transmission. Furthermore, mitigation will bring about new technological approaches for present and future pandemics. Their study also suggest that physical infrastructure such as urban access, infrastructure, environmental factors, and land use patterns as well as and non-physical (socio-cultural, governance, and economic factors) aspects of resilient urban strategies be taken into cognizance. The following principles were designed by Afrin et al., (2021) to be followed in the creation of resilient urban planning and design;

1. transit supportive development,
2. conservation of energy resources and enhancement of vibrant areas which will act as significant elements of suitable housing and community structure,
3. enhancement of the natural health system criteria, including the effectiveness of the environment and health safety in urban areas,
4. enhancement of efficiency and safety of industrial systems including transportation, construction, and infrastructure to augment energy efficiency and thus reduce the overall environmental footprint,
5. active participation of community members from all sectors to develop convenient plans,
6. design and distinct planning of critical infrastructure criteria and systems for the safety of the residents' lives, with the aim of equal level of durability and redundancy with the growing environmental, economic, and socio-cultural shock and stresses arising from

- the pandemic situation, and
7. Development of decreased servicing cost-associated building types and city forms to reduce environmental footprints.

According to Annafo, Addo and Takyi (2021) created a nexus between urban planning, Covid-19 and public health. They integrated the ideas into practice in order to build healthier and liveable cities. They suggested the creation of cities that are less materialistic and individualistic but rather more egalitarian. They observed that for cities to bounce back from the shock of the virus, there is need for infrastructure to be developed while sustaining existing facilities and ensuring environmentally friendly practices are adhered to and the hygiene of the public is not negotiated.

Martinez and Short (2021) showed that Covid-19 has shaped the way cities are planned and configured. Therefore, for cities to be resilient, cities problems of sanitation, hygiene, and health access should be taken seriously. Also, space and opportunities for the urban dwellers should be provided with emphasis on economic and orderly physical development.

#### **4. Strategies for Building Resilient Cities in Nigeria**

In order to build resilient cities from the pandemic, there is need to develop and establish strong economic systems. Planning standards and zoning codes need to be strictly adhered to. This imply that development control in the wake of the virus has to be taken seriously to ensure that developers comply with appropriate set standards in the development of properties. This is to ensure the achievement of good quality environment for living, working, circulation and recreation. Having in mind that the Covid-19 pandemic has negative implications on the survival of the economy, there is need to ensure that infrastructure that will promote development such as roads, airports, transportation lines and communication infrastructure need to be given attention. This will create room for effective trading between and within communities and states. Water bodies may further be dredged and security architecture against insurgency be strengthened. The need to design strategies for economic resilience stems from the fact that there are adverse effects on household incomes, demand for goods and services, and the economy's output during the Covid-19 period and specifically during the period of the lockdown.

However, there was a shortfall in the national budget revenue while the lockdown lasted which was necessitated by the plunge in oil prices. The economy of Nigeria lies majorly on oil products for income generation hence, the shortfall in the oil market which resulted from the restriction of the movement of people due to lockdown which had adverse effects on the demand for oil products. Another, issue that led to economic problem was the decline in private remittances due to the lockdown. On the other hand, there were substantial spending needs associated with covid19. This increase in cost was in the form of increased health costs, new stimulus packages

for businesses, and increased social support for vulnerable households.

Resilient cities in Nigeria will further depend on synergies among the town planning professionals, government as well as individuals. Cities have to be planned such that the social lives of the residents within the city will be resuscitated. The building of resilient cities should trigger the development of plans and settlement schemes that should be handled by planning consultants and authorities. Green cities that will provide aesthetics while creating reasonable spaces for social distances should be advocated. This will come in the form of ensuring green stripes, green belts and urban landscaping.

For cities in Nigeria to be resilient from the pandemic, housing development should be in an orderly manner in line with prescribed minimum standards with reference to global best practices. Planning standards should be taken more seriously in terms of ensuring the building lines, setbacks, sanitary lines, environmental engineering and property boundaries are strictly adhered to. This translates to equipping of the development control department agencies, authorities and units for effective monitoring of development. This equipping has to come in the form of staff recruitment, training and retraining of development control staff, provision of vehicles, equipments and other necessities for ensuring the compliance of developers with established standards.

There is also need for public awareness and enlightenment campaigns against developing without obtaining approvals from appropriate authorities. The public should be sensitized by planners who by virtue of training have the requisite knowledge for providing such guidance. This should be done through town hall meetings or village square, the media and meeting with stakeholders.

The place of the law cannot be over emphasized if the much anticipated resilience has to be achieved. The achievement of resilient cities is enough reason to ensure the adoption of the Nigerian Urban and Regional Planning Law, Decree 88 of 1992. The adoption of the law which will automatically lead to the establishment of a town planning board will make planning thrive and development control to become easier. This implies that most states in Nigeria that have failed to adopt the law should make conscious efforts to make the law operational.

The government and development partners should as well ensure the provision of facilities and infrastructure for the urban residents. For instance, portable water supply systems should be provided for the public and made accessible at reasonable travelling distance in order to provide accessibility. This is because there have to be frequent hand washing by residents of the city. Equally, the decongestion of facilities and infrastructure in the city through urban renewal and slum clearance will drastically increase general living condition of the people. Sanitation and public health should be given concern in subsequent planning schemes by planners and

consultants as this will go a long way in creating room for the inhabitation of serene and clean environments for the urban residents.

## 5. Conclusion

The focus of the paper was on strategies that will ensure the achievement of resilient cities from the deadly covid-19 pandemic. The actualization of resilient cities is largely dependent on strengthening planning activities and processes in the cities through effective development control. The general sanitation and public health of residents of cities in Nigeria should be improved while awareness and enlightenment on the need to ensure standard adherence by development should be embarked upon. The Nigerian Urban and Regional Planning Law Decree 88 of 1992 should be implemented and adopted by states that are yet to adopt as this will lead to the establishment of the urban and regional planning board which will strengthen develop control in Nigerian cities.

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# Physical Planning in Africa and Its Urban Development Validity Deficit: Implications for Resilience and Sustainability of Cities

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### Abstract

*In recent time sustainability and resilience became the two central pillars of the future of human settlements. While the rest of the world are directing their development towards realizing them, Africa seems to be witnessing a mixed cross of development best described as 'African Development Paradox'. The implication of this form of development is that the continent is moving at variance in this laudable global engagement of resilience with the rest of the World. Development of cities in the continent is characterized by high urbanization rate, sprawling and uncontrolled urban growth, infrastructure deficit, slum expansion, high vulnerability and disaster risks, and poor living environment. This situation has been attributed to a number of factors including not planning, planning not based on reality, corruption and poor governance, and not implementing existing plans, thus making it a failure in the direction of urban resilience and environmental sustainability. The solution to this peculiar problem in African cities may be through redefining and reconciling diverse claims and mismatched tools that have strong traditions in urban planning in the continent. This paper therefore analyse the promises and obstacles to resilience in Africa. The paper examines resilience planning in the context of African cities and the factors that drive physical development in the continent; discusses the gaps in African*

*resilience planning tools; discusses African practises of resilience including Nigerian case study and recommends strategies for the future in planning cities in Africa for resilience and sustainability. This paper suggests a new innovative framework (the Resilient City Planning Framework) that addresses the critical question of what African cities should do in order to become more resilient in the future.*

**Keywords:** Disaster, planning, resilience, risk, sustainability

## 1. Introduction

As the world is increasingly becoming urban, by 2030 more people are likely to live in urban than rural areas in developing countries (UN-Habitat, 2012). The urban population of sub-Saharan Africa will triple by 2050 to 1.2 billion people from about 400 million in 2015 (UNDESA, 2018). The top 10 fastest growing large cities of the world are in the region, with Kampala and Dar es Salaam expected to double their populations by 2035. But African cities are ill-prepared for such rapid growth. The population growth and physical expansion of cities have endangered access to infrastructure, undermined environmental quality and increased disaster risks(Mensah et. al. 2021). As the cities expand without adequate planning, many have sprawled into areas that are highly prone to natural hazards such as floods, landslides and cyclones. Even in cities where plans exist, there is lack of enforcement. Migrants settle in hazard-prone areas due to intense competition for urban land. Across the region, 62% of city dwellers live in slums where drainage facilities, solid waste management, and sewage systems are poor. The disaster risk in these slums is aggravated by poor infrastructure and encroachment into low-lying zones and steep slopes.

The United Nations report indicates that from 2000–2008, Africa accounted for over 20% of all the climate-related disasters globally and the economic set-back was 0.6% of global economic losses (UNISDR, 2011). Africa has the highest mortality-related vulnerability indicators for droughts. The number of people exposed to floods rose from 500,000 per year in 1970 to 2 million people in 2010. Flood mortality risk is also increasing consistently in the region. The effects of droughts and floods on physical assets, infrastructure and the environment are rising in Africa, compounding disease outbreaks and food insecurity (Lwasa et al., 2018).

Rapid land use change in the cities is also attributed to the uncontrolled urban sprawl and poor urban planning and management. A future of urban growth accompanied by an accumulation of urban risks, inadequate development interventions and the impact of climate change is worrisome. This escalating urban disasters have in the last two decades has led to a growing global interest on building urban resilience (UNISDR, 2012). UN-Habitat (2019) emphasized

that climate change poses an immediate threat to African cities and hence the need for strategies to ensure that cities in the region become resilient.

While African countries are experimenting with different approaches in recent time, to address the impacts of natural hazards on their cities, by investing resources to reduce the risks, the efforts have been undermined by institutional weakness in effective implementation of policies that could promote resilience (Asante & Amuakwa-Mensah 2015). Today there have been concerns by scholars on how poor urban planning is intensifying the impact of climate change in African cities (Cobbinah et al. 2019). Urban planning is therefore a critical factor to reducing disaster risk and planners have responsibility to work towards making cities safe, sustainable and more resilient against climate change. To reduce the risks and increase the safety and wellbeing of city residents, planners must design ways to address the threats. The critical question is what should African planners do to move the cities from a vulnerable to a more resilient state? This paper examines ways planners can enhance resilience for African cities.

## 2. Concept of Resilience

According to Holling (1973), resilience is the ability of systems to absorb impact and reorganise to regain full functionality. It is “the capacity of a system to undergo disturbance and maintain its functions and controls” (Gunderson & Holling, 2001). Resilience is “the ability of a system, community or society exposed to hazards to resist, absorb, accommodate to and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions” (UNISDR, 2010, 13). Urban resilience is “the measurable ability of any urban system with its inhabitants to maintain continuity through all shocks and stresses, while positively adapting and transforming towards sustainability” (UN-Habitat, 2012). According to Resilient City Framework, a resilient city is defined by the overall abilities of its governance, physical, economic and social systems and entities exposed to hazards to learn, be ready in advance, plan for uncertainties, resist, absorb, accommodate to and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions.

Resilience planning is a holistic approach that takes into consideration future economic, social and environmental developments, including climate change. It is a long-term strategy for cities to improve their sustainability profile and make sure that it lasts in the face of future challenges. Sustainability has endured as a central principle in urban planning because of its engagement with economic development and this grants urban planning greater urgency. Proponents of sustainability emphasize the importance of adding planning to development plans, while planners advocate incorporating sustainability concept into their agenda. For planners, the emphasis of sustainability should be explicitly spatial, with particular focus on the urban environment. The explanation for planning taking this path may be complex, it justifies planners' focus on

the broader consequences of urban land uses, economic activities, housing, urban governance, transportation and public services. Planning's central focus on these areas has steered the profession towards sustainable development. This way, sustainability and planning may be coming closer together, yet much still divides them into separate approaches. Planners can negotiate a merger of planning and resilience to build urban sustainability. Urban resilience planning is understood here as an integrated effort to plan coordinated actions targeted at the short, medium and long term for improving the city's resilience, i.e. its "ability to maintain continuity through all shocks and stresses, while positively adapting and transforming toward sustainability" (2018, 13).

Cities have been implementing strategic plans towards resilience building. Despite the progress made, achieving climate change adaptation represents an issue in the urban context. Bettencourt & Geoffrey (2010) argue that critical urban issues "are typically treated as independent issues," and that "this frequently results in ineffective policy and often leads to unfortunate and sometimes disastrous unintended consequences". The United Nations International Strategy for Disaster Reduction (UNISDR) suggested a resilience-based approach and recognized the need for adaptable policies and processes to address climate-related issues in cities (UNISDR, 2009). One major step is the Hyogo Framework for Action (HFA) 2005–2015, which focuses on "Building the Resilience of Nations and Communities to Disasters" launched in 2005 by the United Nations Office for Disaster Risk Reduction (UNISDR, 2005).

The Sendai Framework for Disaster Risk Reduction 2015–2030 also recognises that risk reduction and resilience building are essential. The UNISDR proposes a checklist of ten essentials to empower local governments and agencies to implement the 'Making Cities Resilient' programme which aims to "promote awareness and commitment for sustainable development practices that will reduce disaster risk and increase the wellbeing and safety of citizens– to invest today for a better tomorrow" (UNISDR, 2010). The elements cover a wide variety of issues ranging from infrastructure, security, economy to institutions in the community. To create resilience in urban systems, it is therefore important to examine the spatial dimension that covers urban space and environment, and the functionality and resilience of strategic services and physical infrastructure (Cardoso et al., 2020).

### **3. Urban Resilience in the African Context**

There has been remarkable progress in urban resilience through planning in some regions in the last decades. Stockholm and Sweden integrated green infrastructure (parks and urban forests) into their urban planning process to enhance resilience to climate change and protect quality of life and health (Xiu et al. 2019). In Europe, cities are adopting bicycle rides and walking to reduce pollution, noise and space use (Tight 2016). In Australian cities, green roofs and buildings are used to mitigate climate change impact (Williams et al. 2010). These efforts

show that urban planning plays a key role in city resilient.

But in Sub-Saharan Africa the growth of cities and their expansion have overwhelmed planning capacity as the speed of urban growth is outpacing existing policies, tools, means and capacities to manage it. Due to lack of adequate and affordable housing, the urban poor tend to settle informally in hazard prone areas with poor infrastructure resulting in high levels of disaster risk. Given the weak urban governance system African city planners now face difficulties in leading the processes aimed at reducing urban disaster risks. This can be attributed to centralised policies and institutional framework, and lack of finance, data and technical capacity with which to plan, thus planners are marginalised in their roles as assigned by law and, consequently, urban planning and management are limited. Due to poor urban governance, planning has drifted from the local planners to external actors as cities tend to rely on external funds and expertise to implement urban development programmes (Myers, 2011).

However, Africa is showing commitment to disaster risk reduction. Acting on the HFA, it adopted Africa Regional Strategy for Disaster Risk Reduction (ARSDRR, 2006–2015). The African Union and sub-regional commissions such as the Economic Community of Central African States (ECCAS), Economic Community of West African States (ECOWAS), Inter-governmental Authority on Development (IGAD), Southern African Development Community (SADC) and East African Community (EAC) are contributing to addressing disaster risks in member countries. SADC and EAC established regional platforms for Disaster Risk Reduction (DRR). ECOWAS established Early Warning and Response Network—an observation and monitoring tool to provide early warning of disasters; and an Emergency Fund to support member states affected by natural disasters.

Generally, investments in DRR are still low in Africa. Inadequate fund was cited as a constraint by HFA reporting countries. They reported fund allocated to disaster management institutions, but only little fund for the planning sector. The funds are administered at the national level by the agency responsible for disaster management. Most of them are ad hoc financing with provisions only for immediate humanitarian relief needs, thus they do not have dedicated funds for longer-term DRR and DRM. Ensuring that resources get to planning authorities continues to be a challenge to most countries in the region.

#### **4. Urban Planning Strategies for Building Resilience in Nigeria**

In Nigeria the government has rolled out policies and measures to reduce vulnerability to climate change. National Emergency Management Agency (NEMA) was established to oversee and coordinate disaster management and its related issues in Nigeria. At the state level are the State Emergency Management Agencies (SEMA). These and other agencies have taken steps to address the impact of climate change and related flood risks through awareness-raising and

infrastructural projects such as urban drainage systems to prevent flooding of roads and houses. Most cases the response to flood disasters is reactive to prevailing disasters. Resettlement of residents in the flood-prone areas is lacking, posing adverse effects on their lives and assets. Most time, responses to disasters are delayed as disaster relief materials take a long time to reach the affected people. In reality, the rapid population growth and unguarded urbanisation have exacerbated the vulnerability of cities. Other challenges in Nigerian cities include erosion, soil pollution, inferno, road accidents, water pollution, epidemics etc.

In 2019, the Federal Ministry of Works, Housing and Urban Development commissioned consultants to conduct studies on the resilience of two cities, Asaba and Makurdi, to risks arising from the impacts of climate change. The report highlights the vulnerability of the cities and recommends strategies and priority action plans to enhance their resilience to current and future impacts of climate change. The resilience scores for the cities were very low indicating that the ability of any of the cities to withstand or recover from disaster is low (see Table 1 for the assessment of disaster preparedness and resilience of Makurdi).

**Table 1: Assessment of Disaster Preparedness and Resilience of Makurdi**

PARAMETERS	SCORE	REMARKS
1 Organization for Disaster Resilience	3	Creation of BESEPA but ill-equipped to carry out the duties effectively.
2 Identification, understanding and use current and future risk scenarios	3	Federal Fire Service has a simulation system that detects risks, but incapacitated by power outage and capacity to cover its designated zones
3 Financial capability for Resilience	2	Poor Budgetary provision and lack of synergizing with NGOs, CSOs, donors/International Agencies
4 Resilient urban development/design	1	An obsolete master plan which is overdue for review.
5 Safeguarding natural buffers to enhance the protective functions from natural capital	2	Riparian Buffers-largely encroached upon by human activities; residential, commercial, industrial. River corridors used as illegal dump sites for wastes.
6 Strengthening Institutional Capacity for Resilience	2	BESEPA lacks sufficient technical staff, equipment and funding. Lack of synergy among MDAs impeding performance.

7	Understanding and strengthening societal capacity for resilience	4	Adaptive measures have been employed by individuals to deal with disasters: flooding and erosion. With awareness their resilience capacity might be better enhanced.
8	Increasing Infrastructure Resilience	4	Poor maintenance of infrastructure where they exist
9	Effective disaster response	4	Reasonable Post-Disaster Response through distribution of relief materials by BESEPA/NEMA
10	Waste management challenge	3	BENSESA and the private sector are making efforts but are overwhelmed with the tasks. Not much has been achieved.
11	Recovery and Build Back Better	1	No evidence of such action
Total		26%	<b>Low Resilience</b>

Source: Envicons Ltd (2019)

They observed that there has not been much attention to planning tools in the efforts at making the cities resilient. Planning activities are uncoordinated and the speed of planning is much slower than that of city growth. Poor land-use planning and enforcement of planning regulations has led to the growth of unregulated buildings and waste management problems in the cities. This is as a result of lack of long-term planning. There is poor urban management and the cities have no masterplans to guide development. Moreover, lack of political support for urban planning undermines urban resilience building efforts. Table 2 shows the proposed action plan for Asaba emphasizing planning approaches to actualize urban resilience.

**Table 2: Proposed Action Plan for Climate Change Mitigation and Urban Resilience in Asaba**

Action	Parameter	Stakeholders
Building and strengthening	Equip relevant public institutions and private agencies with relevant materials.	ACTDA, MoUR, CSC, MoF, MoH, MoE, SEMA
1 Institutional Structure for Urban Resilience and Sustainability	Building the capacity for staff of agencies through training and retraining. Provide sufficient equipment and funding.	

2	Asaba Storm Water and Drainage Project	Prepare Asaba Storm Water and Drainage Master Plan.	MoE, MoW
3	Dredging the streams and tributaries of River Niger	Dredging of rivers/tributaries of River Niger to increase their capacity to receive storm water.	MoE, MoW
4	Erosion control	Tackling erosion in affected areas.	ACTDA, NEWMAP
5	Construction of a Dam upstream of River Niger	Construction of the proposed Dasin Hausa as planned.	(FMoWH), FMoF, FMoA
6	Resilient Urban Planning and Development	Preparing the Master Plan for Asaba. Urban Renewal programmes in blighted areas. Improve the development control mechanism: vehicles, equipment.	ACTDA, MoLS, MoUR, MoF, DSURPB
7	Improvement of the waste management mechanism	Strengthening waste collection process. Providing public refuse bins in neighbourhoods. Establish facilities for waste treatment. To monitor indiscriminate dumping of waste. Public education through jingles Strengthening the Monthly Sanitation programme	Delta State Waste Management Authority, PSPs, local/neighbourhood organizations
8	Strengthening Community and Household Capacity for Resilience	Public Awareness Programmes Information Dissemination through print and electronic media.	ACTDA, SEMA, CSOs; NGOs; MoI.
9	Disaster Response and Recovery	Emergency Response Institutions to provide adequate equipment for prompt response. Establishing community response teams/volunteers	SEMA; NEMA; NGOs CBOs, Int. Agencies;
10	Mass Housing to relocate those living in floodplains	Government public housing Encouraging private developers Site and services programme	MoH, MoLS, Private developers

	Producing budgetary appropriation for Urban Resilience and Sustainability Projects.	
11 Financial Capability and Governance for Urban Resilience	Mobilizing Financial resources from External sources–NGOs, CSOs and donors/ Int. Agencies	MoF, NGOs; CSOs
12 Protecting the floodplains, natural buffers/river banks	Relocating residents in floodplains Re-afforestation project Controlling and preventing development/ activities in such areas	MoLS; NGOs, MoE ACTDA; SEMA; CBOs; MoA,

Source: Zek Consult Ltd (2019).

## 5. Urban Resilience Tools

More recently urban resilience planning has moved from a focus on physical hazard mitigation towards a more encompassing set of practices that recognise the importance of responding to development gaps (Jabareen, 2013). This has resulted in an increasing number of tools and guidelines for resilience planning (UN–Habitat, 2017). Table 3 shows details of seven leading urban resilience planning tools. While most of the tools emphasized the role of urban governments, they require capacities that are not yet available in the context of most cities in Africa. Generally, the tools did not build much of the existing local knowledge in the planning process. However, some of them have step–by–step guides for city resilience planning, based on some methodologies initiated by groups such as UN–Habitat, Arup and 100 Resilient Cities.

**Table 3: City resilience planning tools**

Name	Owning Organisation	Status	Aim/Niche
<b>Asian Cities Climate Change Resilience Network Process (ACCCRN)</b>	ICLEI	Tested in three Indian cities: Shimla, Bhubaneswar and Mysore; it is being used in many cities in Indonesia, India, Bangladesh and Philippines.	Streamlined process for cities to assess their climate risks, formulate and implement resilience strategies.

<b>Building Adaptive and Resilient Communities (BARC)</b>	ICLEI	Widely available online; focus on cities in Canada.	Compendium of resources that provide a milestone-based framework to assist local governments in the creation of adaptation plans to address climate change impacts associated with communities.
<b>City Resilience Profiling Tool (CRPT)</b>	UN-Habitat	Different versions and parts of the tool were applied in cities like Barcelona, Port Villa, Asuncion, Maputo, Lokoja.	Framework to diagnose the level of resiliency (through various indicators) within a city and proposes a plan on how to increase it through action.
<b>City Resilience Index (CRI)</b>	ARUP	Piloted in 5 cities: Hong Kong, China; Shimla, Chile, India, Concepcion, Arusha, Tanzania, and Liverpool, UK.	Comprehensive, technically robust, globally applicable basis for measuring city resilience. It has 52 indicators that combine qualitative and quantitative data.
<b>City Strength Diagnostic (CSD)</b>	World Bank	Implemented in Addis Ababa, Chan To and other cities.	Rapid diagnostic tool for cities that results in the identification of priority actions and investments for resilience. It is only an engagement process.
<b>Disaster Resilience Scorecard (DRS)</b>	UNDRR	Available for ample dissemination and application.	Provides a set of assessments for local governments to monitor progress in the implementation of the Sendai Framework for DRR and assess their resilience.

<b>Resilience Pathways Model (RPM)</b>	UNOPS	Tested in Afghanistan, Bangladesh, Curaçao	Proposes a path for planning and implementing humanitarian/development actions mainstreaming resilience. It is not a stand-alone process, rather a tool to apply in other projects, approaching resilience at different levels, scopes and contexts.
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Sources: Gawler and Tiwari (2014); ICLEI, UN-Habitat [2018]; ARUP and Rockefeller Foundation (2014); Lynch (2018); UNISDR (2017)<https://www.sciencedirect.com/science/article/pii/S2212420919301347-bib19>; UNOPS (2015).

## 6. African-led City Resilience Planning

Recently, the Global Facility for Disaster Reduction and Recovery (GFDRR), UN-Habitat and World Bank had supported countries in Sub-Saharan Africa to develop disaster-resilience at the city, national and regional levels. The strategies used were structured around four pillars:

- Understanding urban disaster risk
- Strategic planning to reduce urban disaster risk
- Investments in infrastructure and capacity for long-term urban resilience
- Responding to and recovering from disasters

The approaches have guides aimed to be adaptable to various cities in their local context, capacity and history of planning. They have helped strengthen efforts to improve resilience planning and infrastructure investments in cities through climate and disaster resilience projects across Sub-Saharan Africa (*Garcia and Nagar, 2021*). Cities where they were used include Abidjan, Accra, Antananarivo, Bamako, Beira, Cotonou, Dakar, Dar es Salaam, Douala, Freetown, Ibadan, Kampala, Kinshasa, Maputo, Nairobi and Saint-Louis. The initiatives developed include the following:

- a. City Resilience Program (CRP): CRP aims at producing cities with the capacity to plan and mitigate adverse impacts of disasters and climate change, enabling them to save lives, reduces loss, and unlocks economic and social potentials. It has three strategic objectives:
  - *Planning for Resilience*: increased access to tools and technical support to effectively plan for resilience.

- *Finance for Resilience*: increased access to multiple sources of financing to implement planned investments in resilience.
- *Partnerships for Resilience*: leverage global partnerships to support their resilience

CRP developed City Resilience Scan (CRS), which provides data, maps, visualizations, and analyses that offer a rapid assessment of critical development challenges that cities face and their relation to climate and disaster risks, using available data and open-source tools. African cities were the first to benefit from CRS. CRP has engaged with about 28 African cities and produced over 20 CRS for African Cities.

- b. City Coastal Resilience in Africa (CityCORE): CityCORE initiative used disruptive technology (including remote sensing and machine learning) to collect information on institutional capacity and existing hazard, exposure and vulnerability mapping analysis to generate rapid risk screenings of coastal cities and to inform investments.
- c. Open Cities Africa (OCA): OCA project is working with mappers and risk experts across 22 African cities to collect spatial data, develop tools to utilize risk information and build local capacity for evidence-based urban resilience interventions. It was financed by GFDRR through the Africa Caribbean and Pacific-European Union (ACP-EU) initiative and Africa Disaster Risk Financing Initiative (ADRF).

The successes recorded using the initiatives include the following:

- a. In Ghana these initiatives informed the design of the Greater Accra Resilient and Integrated Development Project in 2019. Supported by the World Bank's International Development Association (IDA), US\$200 million was provided to finance a set of activities to improve flood resilience, including drainage infrastructure, flood mitigation measures, solid waste management, and local government capacity building.
- b. In early 2019, Beira city in Mozambique was supported by the EU (through ADRF and ACP-EU Building Disaster Resilience in Sub-Saharan Africa program), the World Bank and GFDRR to implement Rapid Screening and Evaluation of Flood Risk Reduction Strategy and Mozambique Cities and Climate Change Project, funded by a US\$120 million IDA credit, for rehabilitation and extension of the city's stormwater drainage system.
- c. In Dakar, Senegal, a 10-year Flood Management Program (2012–2022) was developed with Stormwater Management and Climate Change Adaptation Project, to reduce flood risks in peri-urban areas of Dakar through capacity building, strategic planning and investments. Drainage masterplans were prepared for the flood-prone areas and followed

by Local Urban Development Plans that incorporate strategies for flood risk mitigation.

- d. In Tanzania, the Tanzanian Urban Resilience Programme developed a Flood Mitigation Plan and Framework for Action for the Msimbazi basin. Dar es Salaam Metropolitan Development Project invested US\$300 million to improve the city's infrastructure and services. The project rehabilitated 16 major drains across the river basins and developed the Dar es Salaam Drainage and Sanitation Development Plan (2018–2035).
- e. In 2017–18, a Multi-City Review and Risk Assessment was produced for Sierra Leone by the World Bank. The assessment provided details of natural hazards in Freetown, Makeni and Bo (including landslides, coastal erosion and flooding). In 2018, the World Bank conducted an Urban Sector Review for Freetown, which provided the resilience challenges of Freetown, detailed analysis of issues linked to the built-up environment, and options to address the underlying issues, leading to the Freetown Emergency Recovery Project.
- f. In Uganda, *Kampala Drainage Masterplan* was prepared and is now guiding the re-design, reconstruction, and investment for flood management systems in Kampala. The Masterplan integrated a resilience strategy for an integrated approach to overall flood risk management and the need for measures such as risk-informed land-use planning or green infrastructure. *Kampala Disaster Risk and Climate Change Resilience Strategy* was also developed.
- g. In Mahé, Seychelles, National Coastal Management Plan (CMP) 2019–2024 and National Spatial Data Policy were developed based on OCA. The CMP outlines priority interventions in coastal infrastructure, ecosystem restoration and land planning to tackle erosion and secure a resilient coastline. OCA is also working with communities to collect data on tourism establishments and public buildings below 10meters elevation.

The approaches offer solutions to resilience, but could not strengthen local capacity for resilience planning, thus undermining their very target. Much is still needed to improve local knowledge for urban resilience building. Since the urban spatial dimension of resilience has not been sufficiently integrated into existing tools and policies in Africa and institutional capacity is still underdeveloped, mobilisation of external expertise has been applied, resulting in resilience planning that shifts the decision-making power away from planners.

## 7. Building a Sustainable Resilience Model for Sub-Saharan Africa

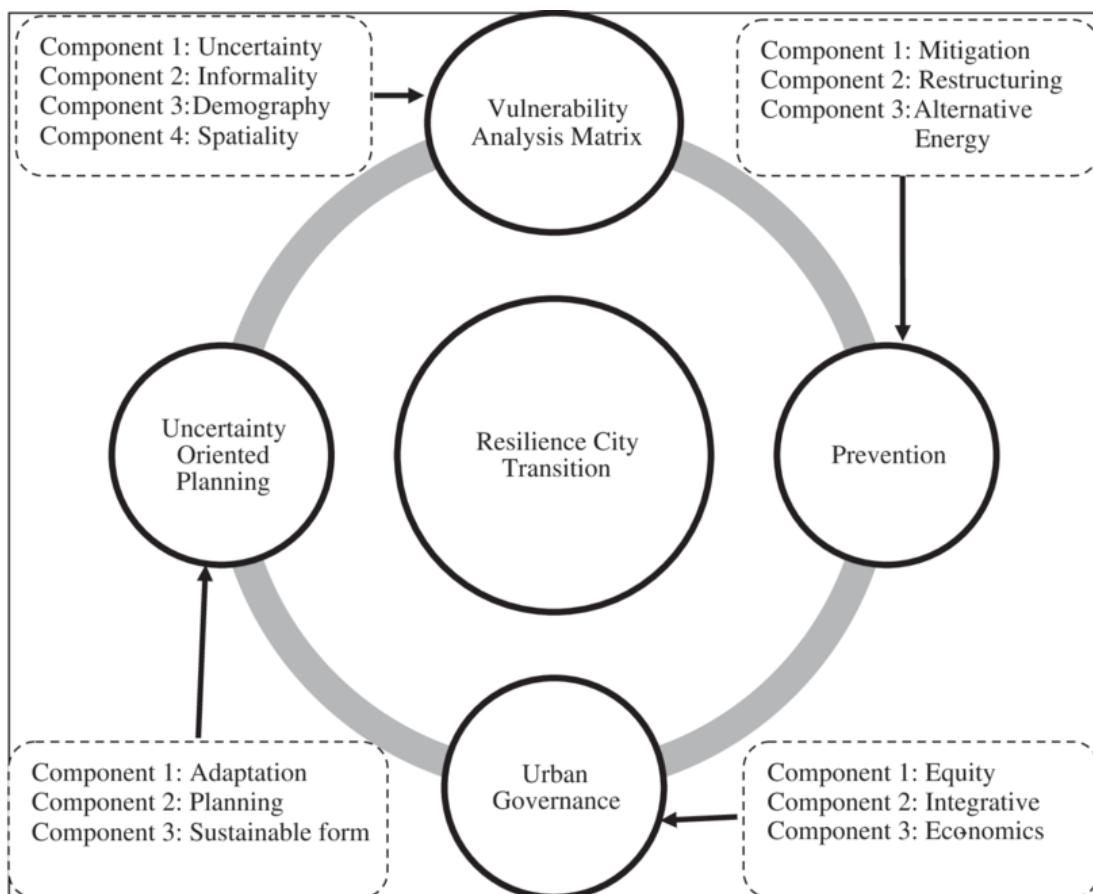
The Sustainable Development Goals and New Urban Agenda support urban planners responding to resilience building with new planning tools informed by local priorities and knowledge.

ActionAid's research on ways to pursue resilience planning in Africa observed that reducing risk and building resilience in African cities requires holistic action at the local, regional and national levels covering the following:

- Empowering communities to identify, reduce and manage risk.
- Strengthening governments' capacity to reduce risk, particularly at the local level.
- Strengthening urban planning and regulatory frameworks.
- Facilitating dialogue and collaboration to reduce risk.
- Involving Non-governmental organisations and community groups(Pharoah, 2016).

Considering the peculiarity of urban resilience in Africa, much more needs to be done to enhance local capacities. There is presently a need for a shift to urban resilience planning tools that minimizes external initiatives and enable local planners to lead the planning process. This paper recommends a resilience planning model based on Jabareen's Framework and the City Resilience Action Planning (CityRAP) Tool. CityRAP was developed by UN-Habitat with some city planners and local governments in sub-Saharan Africa between 2014 and 2019. It aims to create a participatory planning process that culminates in a ten-year Resilience Framework for Action (RFA). The planning process is structured around five pillars: urban governance; urban planning and environment; resilient infrastructure and basic services; urban economy and society; and disaster risk management. The pillars guide cities in collecting and analysing available data and information in a way that enables city authority in action planning for reducing urban risks and building resilience. CityRAP Tool derives from a long time experience of UN-Habitat in deploying participatory planning approaches at community level since early 2000's in southern Africa (Spaliviero, 2006). In 2015 to 2017, the tool was tested and refined through a comprehensive process of learning and evaluation with city partners in Chokwe, Vilankulo and Mocuba in Mozambique, Morondava in Madagascar and Zomba in Malawi; and revised and used in Ouagadougou, Burkina Faso, at the neighbourhood level, and in Moroni, Comoros, at the city level.

Jabareen (2013) conceptualized city resilience as a network of interlinked concepts that together provide comprehensive planning. This framework is not merely a collection of concepts but a construct composed of consistent concepts in which each plays an integral role and is intrinsically linked to the others. Each concept has components (sub-concepts) and the contribution of each concept to the urban resilience is the sum of the contributions of its components. Each component can be measured on a scale, both qualitatively and quantitatively, depending on data availability. The model is presented in figure 1 and discussed as follows:



**Figure 1: Resilience City Planning Framework**

### Concept 1: Vulnerability Analysis Matrix

Vulnerability Analysis Matrix (VAM) is used to analyze and identify types, demography, intensity, scope, and spatial distribution of environmental risk, natural disasters, and future uncertainties in cities. The concept seeks to address how hazards, risks, and uncertainties affect urban communities and urban groups. Vulnerability is a function of a system's exposure, its sensitivity and its adaptive capacity (Committee on Climate Change, CCC, 2010). VAM is composed of four components that determine its scope, environmental, social and spatial nature. The components are as follows:

**Demography of vulnerability:** This component assesses the demographic and socio-economic aspects of urban vulnerability. It assumes that demographic, health and socio-economic variables affect the ability of individuals and urban communities to face and cope with environmental risk and future uncertainties. Accordingly, many variables (income, education, gender, age, physical and mental capacity, accessibility to resources and political power, and social capital) affect the vulnerability of communities (Ojerio et al., 2011).

**Informality:** This concept assesses the scale and social, economic and environmental conditions of informal urban spaces. Informal spaces are unplanned and disorderly (Roy, 2010) and it is assumed that the scale and human condition of informal places in a city have a significant impact on its vulnerability. According to UN-Habitat (2008), much urban expansion in developing cities occurs outside the legal frameworks of building codes and land-use regulations. Due to such socio-spatial character, the cities become more vulnerable to risks and develop the potential to generate new risks, such as infrastructure failure and environmental degradation. Resilience requires the inclusion of vulnerable communities and informal places.

**Uncertainty:** Uncertainty is “perceived lack of knowledge, by an individual or group, which is relevant to the purpose or action being undertaken and its outcomes” (Abbott, 2009, 503). Environmental uncertainties pose new challenges to cities, and challenge thinking about their management and planning. This requires mapping and drawing the scenarios of uncertainties that may affect cities. The component has a critical impact on urban vulnerability and requires the assessment of environmental risks and hazards that are difficult to predict but must be taken into account in city planning.

**Spatial distribution of vulnerability:** This component assesses the spatial distribution of risks, uncertainties and vulnerability in cities. As environmental risks and hazards are not evenly distributed spatially, some areas may be affected more than others. Mapping the spatial distribution of risks and hazards is critical for planning and management in the present and future.

## Concept 2: Urban Governance

This concept focuses on the governance processes in the resilient city. It is hypothesized that a resilient city is one with inclusive decision making process in areas of planning, accountability and collaboration. It allows local stakeholders, including community social groups and grassroots organizations to participate. According to Mercy Corps, making communities resilient is less about science and more about accountable governance (Maclean, 2014). Levine stated *that in our zealousness, often clouded by funding needs, we sideline the vulnerable. Unfortunately when this is done, we then are planning for ourselves and not the vulnerable. Depending on the extent to which we miss the key issues, we largely will design a non-functional resilience program* (Maclean, 2014). In a resilient city the governance system is able to quickly restore basic services and resume social and economic activities after disaster. Urban governance and policies are critical in making cities resilient (Bulkeley& Newell, 2010).

**Integrative approach:** In order to enhance urban governance of climate change and cope with environmental disasters and uncertainties, there is a need to expand and improve local capacity through increasing knowledge, providing resources, establishing institutions and granting more

local autonomy (Bulkeley, 2010). Integrating various stakeholders into the planning process is essential for achieving climate change objectives. Therefore, adaptive management requires new planning strategies and procedures that transcend conventional planning approaches by integrating uncertainties into the planning process. Plans should be flexible enough to quickly adapt to the changing environment.

**Equity:** Climate change increases social inequality and resilience resources are usually unequally distributed. A resilient city has less social inequalities and a fairer distribution of resilience resources and other resources that will improve environmental quality (Stymne & Jackson, 2000).

**Ecological economics:** This component assesses the economic aspects of urban resilience and the economic engines cities put in place to meet climate change objectives and environmental hazard reduction and mitigation. Many types of shock and stress result from urban economies (Leichenko, 2011). Only environmentally sound economics can play a key role in achieving urban resilience and climate change objectives.

### **Concept 3: Prevention**

This concept suggests that in order to move towards greater urban resilience and less vulnerability, cities need to prevent environmental hazards and climate change impacts. Planning aims at preventing future disasters, thus these components assess urban policies for preventing hazards, including spatial restructuring of the city in order to prepare it against future disasters. The components are:

**Mitigation:** This component assesses policies and actions to reduce the factors causing climate change, such as greenhouse gases emission (CCC, 2010).

**Restructuring:** This concept represents the ability and flexibility of a city to restructure itself in order to face social, environmental, and economic challenges. The shift to a knowledge-based economy and diffusion of knowledge has triggered specific spatial structural transformation in cities (Cooke & Piccaluga, 2006).

**Applying alternative energy:** Access to clean and affordable energy is one of the prerequisites for sustainable development, and for making cities more resilient (UNIDO, 2009). Clean, renewable and efficient use of energy is a central theme in planning towards realizing the climate change objectives. This concept suggests that energy should be based on new low-carbon technologies in order to meet emissions reduction targets.

## Concept 4: Uncertainty-oriented planning

This concept suggests that planning should be uncertainty-oriented rather than the conventional approaches. Climate change and its resulting uncertainties challenge the concepts, procedures, and scope of conventional approaches to planning, creating a need to rethink and revise current planning methods. This concept is composed of three interrelated components as follows:

**Adaptation:** adaptation is defined as an “adjustment of behavior to limit harm, or exploit beneficial opportunities, arising from climate change” (CCC, 2010, 60). Most cities apply mitigation policies to address the causes of climate change and failed to apply adaptation policies. The new urban uncertainties posed by climate change challenges the concepts, procedures, and scope of planning. In order to cope with the new challenges, planners must develop policies for adaptation or adjustments that can enhance resilience and reduce vulnerability to climate change impacts. To address these risks, planners have two types of uncertainty or adaptation management at their disposal: Ex-ante management, or actions taken to reduce and/or prevent risky events; and Ex-post management, or actions taken to recover losses after a risky event (Heltberg et al., 2009).

**Spatial planning:** This component assesses the role of planning in transforming the city into a more resilient state. Planning plays a central role in shaping all parts of the built environment, and has a major impact on city resilience. Planners apply land use management, and building and site design codes to regulate development. In order to reduce community vulnerability to hazards, planning should expand its scope to include prediction of risks and uncertainties as well as provide ways to cope with them.

**Sustainable urban form:** This concept deals with urban design and the qualities of urban form which has impact on urban resilience. This component assesses spatial planning, architecture, design and the ecological form of the city and its components (such as buildings and neighborhoods).

The model considers the following questions: Does the plan include designs and infrastructure that can reduce vulnerabilities and make the city more resilient; and does it enhance the city's adaptive capacity, or ability to respond successfully to climate change? Jabareen (2006) suggests the following set of planning criteria which are helpful in evaluating plans for resilience from the perspective of eco-form:

**Compactness:** This translates to urban contiguity and connectivity. It allows use of urban land more efficiently by increasing the density of development and activity, redeveloping existing buildings, conversions, and creation of building additions and extensions (Jenks, 2000). Compact urban space can minimize the need to transport materials and people. This suggests

that planning should promote sustainable modes of transportation through traffic reduction, trip reduction, non-motorized travel, transit-oriented development, safety, equitable access and renewable energy (Clercq&Bertolini, 2003).

**Density:** This affects climate change through reduced consumption of energy, materials and land for housing, transportation and urban infrastructure. High density planning can save significant amounts of energy.

**Mixed land uses:** This indicates the diversity of functional land uses, such as residential, commercial, industrial, institutional, and transportation. It allows planners to locate compatible land uses in close proximity to one another in order to decrease the travel distance between activities, encouraging walking and cycling, and reducing the need for car travel as activities and facilities are within close range to each other (Alberti, 2000).

**Diversity:** This is a multidimensional phenomenon that promotes other desirable urban features, including variety of housing types, building densities, household sizes, ages, cultures, and incomes (Turner & Murray, 2001).

**Passive solar design:** This aims to reduce energy demands and provide the best use of passive energy through specific planning and design measures, such as orientation, layout, landscaping, building design, urban materials, surface finish, vegetation, and bodies of water. This facilitates the optimum use of solar gain and microclimatic conditions and reduces the need for cooling of buildings by conventional energy sources (Thomas, 2003).

**Greening:** Greening brings nature into the city, and contributes to urban environment, including biodiversity, urban climate, attractiveness, and health (MacKillop, 2012).

**Renewal and utilization:** These are the processes of redeveloping sites that are no longer appropriate for their original use. Redeveloping sites are ways to revitalize cities, contributing to their sustainability and resilience.

The flexibility of the model makes it work in different geographical scales and contexts. The model represents a first attempt to locally support African cities to plan for their resilience by enhancing their capacities and taking maximum advantage of local knowledge. This is a shift from the pursuit of resilience building in African cities through expert-led approaches.

## Conclusion

This paper recommends a new conceptual framework that addresses the critical question of what cities should do in order to move towards a more resilient state in the future. It is a network

of interlinked concepts that provides a comprehensive engagement for City Resilience. The contribution of each concept to the framework of urban resilience is the sum of the contributions of its measurable components. Each concept has specific roles. The ‘Urban vulnerability matrix analysis’ focuses on the governance culture, processes, and roles of the resilient city. This concept is significant for the resilient city for its contribution to the spatial and socio-economic mapping of future risks and vulnerabilities. The ‘Urban governance’ concept contributes to the holistic management of urban resilience. It assumes that there is a significant need for a new approach to urban governance in order to cope with uncertainties and future environmental and climate change impact challenges. The concept of prevention pursues the goal of preventing environmental hazards and climate change impacts. The fourth concept, ‘uncertainty oriented planning’, demonstrates that planning should adapt its methods in order to help cities cope with uncertainties in the future. The generality of the urban resilience issues in Africa makes the study useful for the region. Cities must enforce proactive planning that can direct them onto a path of resilience. Planners need to spear-headed the process and build the required capacities for addressing hazards within broader resilience plans. Therefore new capacities should be established, such as developing the knowledge of planners on building a resilient city.

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# The Green Agenda: Prospects and Implications for African Cities, Port Harcourt Scenario, Nigeria

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### Abstract

*Urbanisation is synonymous with urban population growth, spatial area expansion and increase in urban activities. The study reviewed the United Nations Green Agenda (UNGA), identify its prospects and implications to urban areas such as Port Harcourt municipality, examine the prospects and implications of UNGA and recommended an appropriate policy framework to actualise the UNGA in the study area in reference to resilience and urban governance. The study adopted a qualitative approach using key informant interview schedule and content analysis for datacollection and analysis for the study. A total of seventeen key informants were interviewed including government officials and Town Planners. The study identified prospects of achieving UNGA including large population, large economic base and resources, physical planning and urban development laws and policies, master plans, planning schemes and implementation institutions. The study also found the implications that limits UNGA achievement in the municipality are political instability, poor conceptualisation of urbanisation, poor urban and institutional framework, lack of manpower and poor urban governance and corruption. The study made these recommendations to actualise UNGA and SDGs by government reviewing all development plans (the Port Harcourt Master Plan of 1975, the Greater Port Harcourt City Development Plan of 2009 and other planning schemes) to identify gaps and restructure goals and targets; encourage the promotion of good urban governance that will allow for all urban stakeholders to*

*be involved in the decision making process; clear-cut urban policy and framework to promote institutional coherence between planning and development agencies in urban planning and management in the municipality; and harness the potentials as identified in the study for the regeneration of neighbourhoods and urban communities that are decaying and posing threats to sustainable development to guide, control and manage urban growth and development to promote UNGA and SDGs.*

**Keywords: African Cities, Port Harcourt Municipality, Prospects and Implications, Sustainable Development, United Nations Green Agenda,**

## Introduction

Urban population in African cities is growing at an unprecedented rate (Muggah&Kilcullen, 2016). The United Nations (UN) put the growth rate of urban population in Africa at 40% in 2015 and projected its growth to reach 60% by 2020 (Teye, 2018). It is expected that this growth will continue and more in small and intermediate cities in Africa (United Nations Human Settlements Programme (UN-Habitat), 2016). Cities in Africa with a large population include Lagos (Nigeria) 21 million, Cairo (Egypt) 20.4 million, Kinshasa (D.R. Congo) 6.5 million, Abidjan (Cote d' Ivoire) 4.8 million, Alexandria (Egypt) 4.7 million, Johannesburg (South Africa) 4.4 million, Dar es Salaam (Tanzania) 4.4 million, Casablanca (Morocco) 4.3 million, and Accra (Ghana) 4.1 million (Teye, 2018).

The growth has presented mammoth challenges and exceptional opportunities to African cities which have led to the transformation of socio-economic policies of several governments and businesses in Africa. However, to address the challenges faced by cities globally, the UN has initiated the United Nations Green Agenda (UNGA-Agenda 21) that cities will adopt to improve quality of life and sustainability in cities. The Green Agenda is an international programme of action for achieving sustainable development during the 21st century (United Nations, Department of Economic and Social Affairs (UNDESA), 2015). The UNGA Green Agenda is expected to build on the Millennium Development Goals (MDGs) and cover up gaps that were not realised by the MDGs starting from 2015–2030 (UNDESA, 2015). The Green Agenda has become a critical tool for setting and actualising of global cities goals and targets for sustainable urban development. Agenda 21 is a binding agreement of the United Nations and the global governments on how earth resources will be used, controlled, and managed for the present and future generations (UN, n.d.). It is expected that national, regional, and local governments will draw up developmental and environmental action plans, programmes and monitoring framework

with achievable goals and targets in their domains that will complement the UN Green Agenda (United Nations Conference on Environment and Development (UNCED), 1992a).

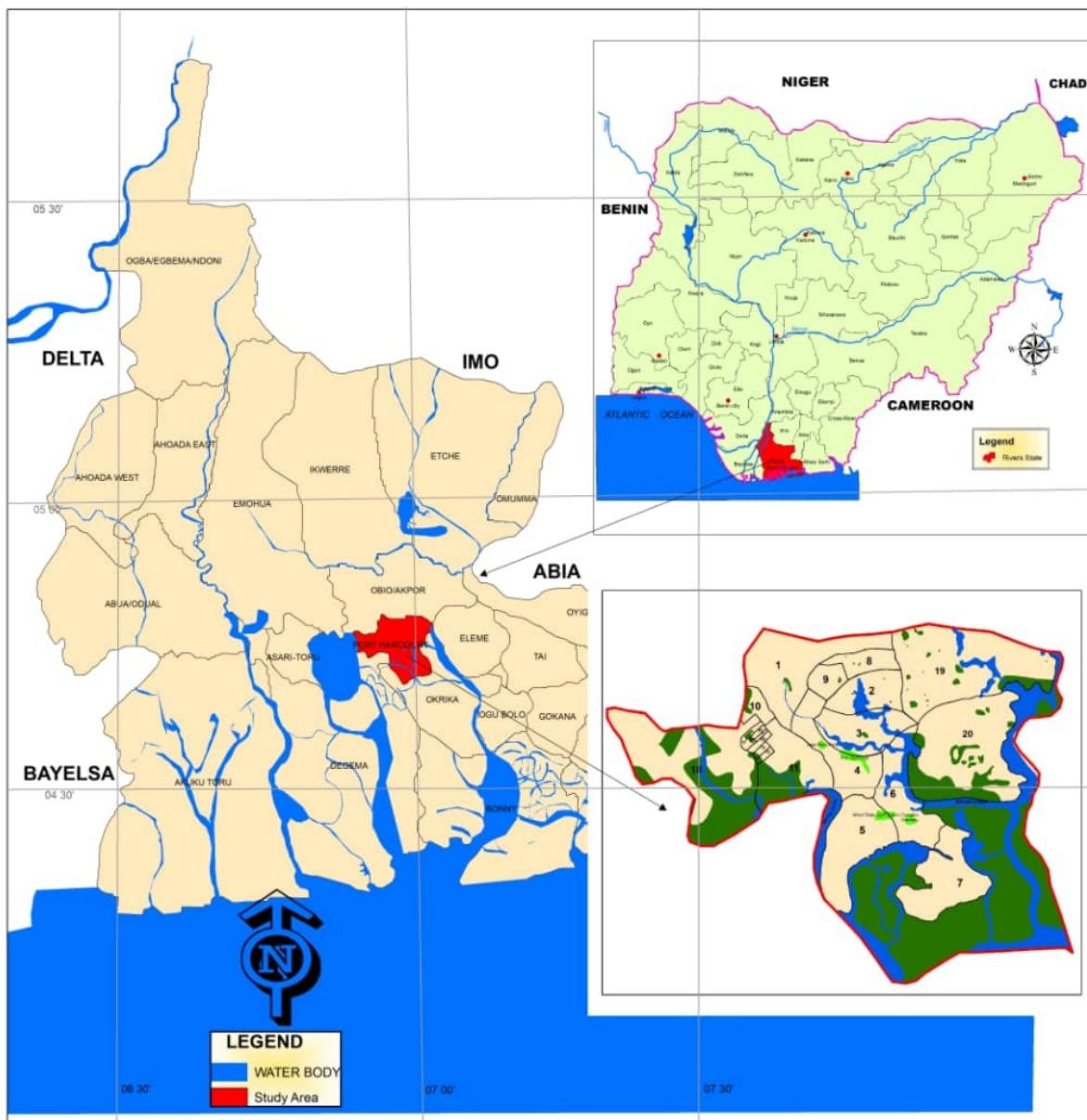
Many countries have prepared local plans and implementation frameworks to meet the UN Green Agenda (UNGA) especially the developed economies in Europe, Australia and North America (UN, 2019). Consequently, most developing economies in Africa, Asia and South America have not prepared and their own local plans and implementation framework that will kick-start and actualise the UNGA. Many Nigerian urban centres including Port Harcourt municipality have not lived up to this expectation. This has projected many developing economies to be fragile and not committed to meet the global agenda of sustainable development. This caused cities in these continents to be faced with many environmental challenges and poor urban governance issues. However, with the dwindling global economic crisis and conflicts in many Africa and Asia countries, the Green Agenda is becoming a doubt and far-reaching to achieve which is the case of Port Harcourt municipality. This study is focused on identifying and examining the prospects and implications of the UN Green Agenda on the city environment and improving the situation.

Urban areas across the globe especially in developing countries such as Africa are faced with series of problems emanating from rapid urbanisation and unplanned urban growth and development (Vardoulakis, Dear & Wilkinson, 2016). Port Harcourt municipality is also faced with these urban problems like many other urban areas in Africa. These problems have resulted in the development and formation of informal settlements and the deterioration of planned neighbourhoods in the municipality. These impediments have not given the majority of urban dwellers within the municipality opportunity to be part of the urban policy-making process thereby reducing the chances of a large segment of the population voice not being heard. This has affected the actualisation of the UNGA to promote sustainable urban growth and development. Port Harcourt municipality is known as the “Garden City” of Nigeria in 1960’s to the early 1990’s, flourishing with green elements over its landscape, clean environment and access to basic urban infrastructure and services. These conditions have changed in recent times, and created concern among professional planners and scholars. This has prompted the examination of the UNGA in reference to its prospects and implications to the municipality to provide a framework for a quality urban environment and opportunity for all stakeholders. The study assessed the prospects and implications of the UN Green Agenda on Port Harcourt municipality, Nigeria. The specific objectives of the study include:

- i. Review of the provisions of the UN Green Agenda;
- ii. Identify and examine prospects and implications of the UN Green Agenda in reference to Port Harcourt municipality; and
- iii. Suggest an appropriate policy framework to actualise the UN Green Agenda in Port Harcourt municipality.

## Scope of the Study

The geographical scope of the study covers Port Harcourt municipality in Rivers State (see Figure 1). Contextually, the study reviewed the provisions of UNGA, identified and examine prospects and implications of the UNGA in reference to Port Harcourt municipality, and make recommendations as policy framework to actualise UNGA in Port Harcourt municipality.



**Figure 1: Nigeria Showing Rivers State and Port Harcourt Municipality**

**Source:** Surveyor General's Office, Port Harcourt, 2021

## Literature Review

Environmental and social policies and programmes prepared by many governments (national, regional and local authorities) of African cities are crucial to the success of achieving the UN Green Agenda (African Development Report, 2015). Though, implementation of these policies and programmes is the key to achieving the agenda. It is important to highlight the scope of the agenda, the prospects and implications to African cities to governments and other stakeholders in the urban environment especially the Town Planning profession which is responsible for managing the environment and controlling and directing growth in the urban environment to achieve a healthy and liveable city.

### The UN Agenda 21 and Challenges

Agenda 21 is a non-binding action plan of the United Nations regarding sustainable development (Fajack, 2014). This is a fallout of the Earth Summit of UN Conference on Environment and Development held in Rio de Janeiro, Brazil in 1992 (UNCED, 1992b). In the conference, 178 governments adopted the Agenda, and it is expected the agreements reached in the conference, the UN, multilateral organisations, and governments in the world will key into the action plan to provide their strategies, programmes and plans at the local, national, and global levels to achieve global sustainable development (UNCED, 1992b).

After the conference, it was expected that countries and cities will initiate and develop their Local Agenda 21 Plan that will correspond and promote the UN Agenda 21 (Jacobi, 2002). Agenda 21 is the forerunner of Sustainable Development Goals (SDGs) that is expected to be achieved by 2030. The UNCED (1992b) targets of Agenda 21 include:

- i. Social and Economic Dimensions—towards combating poverty especially in developing countries, changing consumption patterns, promoting health and sustainable settlement in decision making and sustainable population;
- ii. Conservation and Management of Resources for Development—atmospheric protection, combating deforestation, protecting the fragile environment, conservation of biological and management of biotechnology and radioactive wastes;
- iii. Strengthening the Role of Major Groups—the role of children, youths, women, NGOs, local authorities, businesses and industries and workers and strengthening the role of indigenous people, their communities, and farmers; and
- iv. Means of Implementation –science, technology transfer, education, international institutes and financial mechanisms.

It is expected at the local level, local governments and municipal authorities should develop their Agenda and a framework that encompasses these targets to achieve the aim of UN Agenda 21. At regional levels, continents, and countries such as Australia, Europe (France, Sweden,

Germany, United Kingdom), North America (the United States of America and Canada) are all signatories to the Agenda, though the United States of America does not hold it strong since the agreement is a non-binding Agenda (UNCED, 1992b). This has made enforcement of the targets of the Agenda problematic and not able to achieve its aim.

There are many challenges identified that impede the actualisation of the Agenda by the UN and its organisations, governments, and individuals. According to the UN (2019) these challenges include:

- i. Uneven development across the globe and other identified trends of socio-economic growth and development;
- ii. Increasing globalisation;
- iii. Increasing inequalities in income between regions, countries, cities and individuals; and
- iv. Continued deterioration of the global environment through human activities from policies and projects of decision making to increase production at all costs.

## **United Nations Sustainable Development Goals**

The metamorphosis of the UN Agenda 21 into the UN Sustainable Development Goals (SDGs) became a global agenda. The SDGs was developed in 2015 during the UN Sustainable Development Summit and the SDGs is a 15year plan period (UN, 2020). In the summit main objective is to reaffirm the UN Agenda 21 by the UN and signatory countries that have elapsed and give clear mandates and directives to countries and cities to actualise the global sustainable and environmental goals. The SDGs is 17 goals and 169 targets and was set to cover people, planet, prosperity and partnership (UN, 2020). The SDGs as stated by the UN (2020) include:

- i. Goal 1-No poverty
- ii. Goal 2-Zero hunger
- iii. Goal 3-Good health and wellbeing
- iv. Goal 4-Quality education
- v. Goal 5-Gender equality
- vi. Goal 6-Clean water and sanitation
- vii. Goal 7-Affordable and clean energy
- viii. Goal 8-Decent work and economic growth
- ix. Goal 9-Industrial, innovation and infrastructure
- x. Goal 10-Reduce inequality
- xi. Goal 11-Sustainable cities and communities
- xii. Goal 12-Responsible consumption and production
- xiii. Goal 13-Climate change
- xiv. Goal 14-Life below water
- xv. Goal 15-Life on land
- xvi. Goal 16-Peace and justice, strong institution

## xvii. Goal 17–Partnerships to achieve the Goal

The SDGs is a global commitment to eradicate poverty and achieve sustainable development by 2030 worldwide. This vision is shared by UN member countries and partners towards the actualisation of sustainable development across the boundaries of continents, regions and countries in the globe (European Commission (EU), 2019).

### **Role of Urban and Regional Planners in UNGA**

All these goals are supposed to be championed by Urban and Regional Planners as they are within the purview of the profession statutorily. The SDGs covers three spectra of the environment namely, biophysical, social, and economic. Although, urban planners are more concerned with Goal 11 (Sustainable Cities and Communities) of the SDGs which show neglect and poor understanding of the concept of the environment regarding the SDGs. Urban Planners are expected to think beyond Goal 11 as all goals are what the planner consider in the development of public policies, programmes and plans in the environment. The planner proposals enlist physical, social, and economic issues and how to close the gaps of inequality experienced in societies whether urban or rural (United for Smart Sustainable Cities (U4SSC), 2017).

However, town planners cannot achieve the implementation of the UNGA alone but by constant lobbying, negotiation, and contestation with other stakeholders and actors in the decision-making process such as politicians, entrepreneurs, civil societies, and individuals. In most scenarios, the town planner plays a neutral and silent role in the case of developing economies such as Nigeria. Often times the town planner plays advocacy role, though where the governance system and democratic institutions are strong like the developed economy. This brings transparency and accountability, equality, responsiveness, effectiveness, participation and inclusiveness and rule of law in the urban picture.

The role planners play in the Green Agenda issue determines the level of achievement and awareness the profession will create in the society in reference to urban governance, and environmental policies and programmes. The negligence of planners in the urban green agenda exposes the urban environment to danger and threat of chaos in reference to urban governance issues. This has portrayed the planners as not having the required momentum to press for positive urban change that will spur environmental and socioeconomic growth and development in urban areas, especially in cities and towns.

### **Methodology**

The study employed a qualitative approach, which key informant interview and focus group discussion research designs were used for data collection and analysis. Hence, to achieve the

aim and objectives of the study purposive sampling technique was employed. Purposive sampling technique was used to determine the population that participated in the study who are knowledgeable persons that can address the study questions. A total of seventeen (17) key informants were interviewed for the study that comprises Ministries Departments Agencies (MDAs) and experts involved in urban development and physical planning. The agencies that were interviewed include Federal Ministry of Lands, Housing and Urban Development (FMLHUD) and Rivers State Ministry of Urban Development and Physical Planning (RSMUDPP), and experts (Town Planners) were interviewed (see Table 3.1). Thus, after interview of the key informants on the subject matter, their responses were categorised as themes and concepts for content analysis and discussion.

**Table 3.1: Determination of Sample Size**

S/n	MDAs/ Experts	Sample Size
1	Federal Ministry of Lands, Housing & Urban Development (FMLHUD)	1
2	Rivers State Ministry of Urban Development and Physical Planning (RSMUDPP)	1
3	Town Planners	15
<b>Total</b>		<b>17</b>

**Source: Authors' Fieldwork, 2021**

## Results and Discussions

### Prospects for African Cities–Port Harcourt Municipality

Port Harcourt municipality as many other African cities and urban areas have prospects that will promote the actualisation of the UNGA as a strategy to achieve sustainability in the municipal area. Thus, the Port Harcourt Master Plan of 1975 and other planning schemes have provided the platform for the implementation and actualisation of the UNGA in the municipality. Survey of the municipality through the interview of MDAs that are institutionalised to implement these development plans and professionals in the built environment that carry out the objectives of these plans in the public and private sectors have pointed out many opportunities that the municipality will leverage to actualise UNGA. Some of the identified prospects to achieving UNGA as pertaining to the municipality include: large population size, large economic base and resources, physical planning and urban development laws and policies, and Master Plans, Planning Schemes, and implementation institutions.

### ***Large Population Size***

Port Harcourt municipality is among the most populated urban areas in the southern region of Nigeria. Being one of the origin of urban development in the Niger Delta region, it has attracted people from the hinterlands and other smaller towns to the municipality. The in-migration of people has further increased natural population growth which the municipality can leverage for required manpower or workforce to drive her economy. The planned neighbourhoods, indigenous enclaves and waterfront communities can boast of large population in municipality especially in the waterfront communities, though the actual population is not yet none for government to use as opportunity for planning and development.

### ***Large Economic Base and Resources***

Port Harcourt municipality from records of MDAs and experts have been identified as the municipality that has a large economic base and natural resources. This reflects in the marking of opportunities and deposition of natural resources such as land, oil and gas firms, telecommunication facilities and services, financial institutions, and large markets that can provide the platform to drive businesses and investment opportunities. The availability of marginal lands that have been reclaimed by government and investors have encouraged multinationals such as the Nigerian Liquified Natural Gas Company (NLNG). Other firms such as INTELS, Prodeco, and construction conglomerate Julius Berger, and marine services firms' office complexes are located in the municipality. The municipality also hosts the Port Harcourt Terminal of the Nigeria Ports Authority and the Trans-Amadi Industrial Estate with several industries and servicing firms. The taxes and revenues from these firms can be used for the provision of basic social infrastructure and services that will enhance SDGs that form the UNGA for cities globally.

### ***Physical Planning and Urban Development Laws and Policies***

One prospect of the Port Harcourt municipality in the promotion of UNGA as identified is the availability of physical planning and urban development laws and policies for the municipality. Identified physical planning and urban development laws and policies that have been domesticated in the municipality include the Nigerian Urban and Regional Planning Law Decree No. 88 of 1992 (Amended in 1999) (FGN, 1992), Rivers State Physical Planning and Development Law No. 6 of 2003 (RSG, 2003) and the Greater Port Harcourt City Development Authority Law No. 2 of 2009 (RSG, 2009a). These laws are metamorphoses of urban policies by the government at national and local levels such as the National Urban Development Policy of 2006 (FGN, 2006a) and National Housing Policy of 2006 (FGN, 2006b). These laws have promoted the reorganisation of urban communities and structures in parts of the municipality. Port Harcourt municipality has leverage on them to enhance urban planning and development

activities to achieve sustainable development and some goals of the UNGA. The Rivers State Government has made urban policies for urban planning and development such as urban renewal projects and the development of Greater Port Harcourt City which affects the municipality.

### ***Master Plans, Planning Schemes, and Implementation Institutions***

Fundamentally, one of the identified prospects in the achievement of UNGA in Port Harcourt municipality is the availability of city plans and development schemes. These plans and planning schemes include Port Harcourt Master Plan of 1975, the Greater Port Harcourt City Development Plan of 2009, Reclamation Layout, Coronation Layout, Eagle Island Site and Services Scheme, ElekahiaHousing Estate, NdokiHousing Estate, Aggrey Housing Estate, Marine Base Estate, UPE Sand-filled Layout, Borikiri Housing Estate, Abuloma Housing Estate, Civil Servant Quarters (Aggrey Road and Victoria/Bende/Niger/Bonny Streets) and Rainbow Town Estate (RGS, 2021a; RSG 2021b; RSG, 2021c). There are also privately initiated planning schemes in the municipality including the Golf Estate and the Trans-Amadi Gardens.

These development plans and planning schemes prepared for the municipality, the Rivers State Government has established some implementing and monitoring institutions and agencies to implement the plans and schemes. The institutions and agencies established by the government include the Rivers State Ministry of Urban Development and Physical Planning, Rivers State Ministry of Housing, the Greater Port Harcourt City Development Authority and Rivers State Property Development Authority. All these plans, schemes and institutions are positive steps by the government to develop a sustainable city that will enshrine the tenets of the UNGA in the municipality. The success of these plans and schemes are still in doubt from the implementation of processes and sustainability index assessment.

### **African Cities–Port Harcourt Municipality**

#### ***Political Instability***

African cities including Port Harcourt municipality is faced with political instability. The regular changing of governments through elections and appointments have shaped the political landscape and architecture. These changes equally affect urban development and physical planning policies and programmes. Every government comes with its own ideology irrespective of its political affiliation. It is observed that there are no clear-cut and consistent urban policies that will give direction to the future of the municipality because of governance issues and synergy between governments (federal, state, and local), urban communities and settlements, and other stakeholders (multinational, professionals in the built environment, international agencies and non-governmental organisations) that will foster UNGA in the municipality.

The non-autonomy of municipal councils and LGAs in Nigeria affects Port Harcourt municipality also. Port Harcourt municipal council rely on allocations and subventions from the federal and state governments to implement programmes and projects. This has limited her performance to provide urban infrastructure and services to her population. The actualisation of UNGA in the municipality require political backing and well structure political system that is not encumbered with political and financial resources. The municipal authorities and MDAs operating in the municipality are constraint with political and financial resources to prepare and implement development plans and schemes as decision-makers only carry out programmes and projects that will loud their political ambitions and reigns.

### ***Poor Conceptualisation of Urbanisation***

Many African cities are fundamentally not prepared to implement the UNGA. The observations in Port Harcourt municipality indicate that the Port Harcourt Master of 1975 (Special Konsult, 1975) and many planning schemes prepared by the Rivers State Government have become moribund and obsolete as they have been not fully implemented and expired from the number of years they are expected to cover. Though, the state government has prepared a new city plan called the Greater Port Harcourt City Development Plan (GPHCDP) that covers 8 LGAs include the Port Harcourt municipality. Hence, the understanding of urbanisation and its dynamics are of critical concern to the government and other urban stakeholders.

The rapid urbanisation occurring in the municipality has manifested into the emergence of rapid informal housing development and economic activities. There are pockets of informal housing development that are sighted in many parts of the municipality especially at the southern, eastern, and western parts of the municipality noted of waterfront settlements and communities where land is cheap, and no planning scheme is covering (see Fig. 2). There is evidence of rapidly depleting mangrove forests and habitats of aquatic lives found in the municipality as a result of illegal bunkery activity polluting the urban environment with black soot, crude and carbons (see Fig. 3). The municipality is dotted with many informal economic activities ranging from illegal motor parks, markets, and other forms of trading. The municipality authorities have not conceptualised and understand the dynamics of urbanisation, which is supposed to benefit to improve on the socio-economic growth and development of the municipality. This condition has made the municipal authorities unable to access the huge economic accruals attached to urbanisation in terms of increase in internally generated revenue, job creation and provision of fundamental infrastructure and services in the municipality to compete with other urban areas locally and globally.



**Fig. 2: Mangrove Forest Clearance and Reclamation for Informal Housing Development in Port Harcourt Municipality**

Source: Authors' Field Survey, 2021



**Fig. 3: Rapid Depleting Mangrove Forest as a Result of Crude Oil Pollution in Port Harcourt Municipality**

Source: Authors' Field Survey, 2021

### ***Poor Urban and Institutional Framework***

Port Harcourt municipality lacks a proper urban and institutional framework for the actualisation of the UNGA in the context of urban planning and management. There is no agenda for the municipality to develop and compete with other urban areas globally. Even with the Port Harcourt Master Plan of 1975, the Greater Port Harcourt City Development Plan of 2009 and other planning schemes from the 1970s–1990s, the municipality has failed to make new urban policies and prepare new plans that will structure the urban area to meet new opportunities presented by the municipality and follow the current trends of urban development.

The institutions established by the government have not been well structured to prepare and implement urban policies and programmes to actualise UNGA goals and targets. The Rivers State Ministry of Urban Development and Physical Planning, Greater Port Harcourt City Development Authority and the Port Harcourt City Council have a disjointed arrangement as their coordination is not positive in actualising sustainable urban development. The area of jurisdiction for operations are not clearly defined and the fluidity of the boundary often morph into conflicts. The Nigerian Urban and Regional Planning Law Decree No. 88 of 1992 (Amended in 1999), Rivers State Physical Planning and Development Law No. 6 of 2003 and the Greater Port Harcourt City Development Authority Law No. 2 of 2009 clearly make the functions and responsibilities of the planning agencies that will implement these laws to guide, control and manage urban planning and development. But these agencies are handicapped by too much political interference and established to fail in their responsibilities. Politicians are appointed to manage the affairs of planning agencies in the state that do not understand urban and physical planning issues to prepare and implement urban policy framework to achieve UNGA and sustainable development agendas.

### ***Lack of Manpower***

Manpower is a major challenge to the actualisation of UNGA in the municipality. The quantity and quality of manpower are inadequate to man the various planning agencies established by the government to carryout planning activities in the state. The MDAs have a handful of qualified Town Planners and other professionals in the built environment in the establishments. With these deficiencies observed in the establishments to articulate policies, programmes, and plans as a framework to promote UNGA and sustainable development goals and targets are a mirage. The existing system does not recognise the importance of Town Planners in the development process of building a sustainable urban environment in the case of Port Harcourt municipality.

### ***Poor Urban Governance and Corruption***

Urban governance is politically influenced to create and operate political institutions, government

capacity to make and implement decisions and the extent the decisions recognise and respond to all interests especially the poor and voiceless in the society(United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) & UN-Habitat, 2015). In the case of Port Harcourt municipality, governance has not recognised all urban stakeholders in the decision-making process and provide opportunities for them to contribute the ideas to the provision of urban planning and development framework for the municipality. The system in operation is a top-bottom structure where the government and politician are at the top and the urban poor and vulnerable minority groups are at the bottom in the hierarchy of decision making.

The top-bottom structure eliminates the principles of urban governance such as rule of law, fairness, inclusiveness, participation, transparency, equity, accountability, consensus-oriented and responsiveness in the decision-making process and encourages corruption in the system. Public resources are allocated by politicians without considering the needs of the citizens in the municipality. The provisions of the laws are not followed to achieve good governance and hinder the provision and actualisation of UNGA, and sustainable development goals and targets as specified by the UN. In the municipality, many groups and social classes are not considered in the decisions process as their opinions do not count to any policy, programme and project in the urban environment rather accept government decisions whether positively or negatively affect them.

## Conclusion and Recommendations

Globally, urbanisation has provided opportunities and challenges to urban areas. This condition has called for a new way to think, assess, and approach urban issues in contemporary times. The preparation of a framework for the development of urban areas such as the UNGA and SDGs by the UN has given urban areas a paradigm shift to address urbanisation and its dynamics. The Port Harcourt municipality scenario has painted a clear picture of how our urban areas, municipal authorities and other urban stakeholders and actors have responded to addressing urbanisation vis-à-vis UNGA and SDGs principles. The study has highlighted prospects and implications of urbanisation in reference to Port Harcourt municipality which will urban stakeholders including governments, international agencies, non-governmental organisations, and individuals' alternative approach to improve the quality of life and urban environment of the municipality. The study has further made an urban planning policy framework to provide and implement UNGA and SDGs in the municipality to be in line with UN expectations for urban areas. The makes these recommendations to promote the actualisation of the UNGA in the municipality including:

- i. Rivers State Government should review of all development plans including Port Harcourt Master Plan of 1975, the Greater Port Harcourt City Development Plan of 2009 and

other planning schemes that affect the municipality, to identify gaps and restructure goals and targets of each sector that will promote UNGA and SDGs in the study area;

- ii. Government should collaborate with other urban stakeholders to encourage the promotion of good urban governance that will allow for all urban stakeholders to be involved in the decision-making process especially the urban poor and vulnerable groups in the municipality to reduce corruption and provide checks and balances in governance;
- iii. Government should make a clear-cut urban policy and framework to promote institutional coherence between planning and development agencies in urban planning and management in the municipality;
- iv. Government, international development agencies, urban communities and professional planners should form a partnership that will harness the potentials identified in the study include large population, planning laws, economic resources and development plans for the regeneration of neighbourhoods and urban communities that are decaying and posing threats to sustainable development to guide, control and manage urban growth and development to promote UNGA and SDGs principles and goals.

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## CHAPTER TWELVE

# Responses To Urban Stresses And Shocks: A Review Of Actions To Mitigate The Pandemic In Kaduna Metropolis.

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### Abstract:

Coronavirus (COVID-19) has forced city governments to reconsider the relationship between urban space and health in order to ensure physical distancing while meeting the needs of inhabitants. Cities around the world are already involved in the transformation through new models of sustainability and all spheres of life particularly transport and recreation. The paper focuses on Kaduna State Government policies on Post-COVID sustainable, mobility approaches with a view to applying physical planning solutions. Among the objectives of the paper are the evaluation of responses of Kaduna State Government in transforming urban environments to tackle the pandemic. The World Health Organization (WHO) guidelines on mobility during the COVID-19 outbreak were mostly directed at creating more spaces for people. In Kaduna metropolis, this was achieved by avoiding the overloading of public transport and private cars. Also a homogenous awareness campaign was established in Kaduna State among policy makers and planners. The paper concludes that, the adoption of Post-COVID solution by Kaduna State Government is a positive response to urban challenges in the State. Among the recommendations of the paper are the excellent opportunities opened for planners and policy makers to transform cities in Kaduna State to be more efficient and



*sustainable as observed in the transformation of Kaduna metropolis through the ongoing Urban Renewal Projects.*

**Keywords:** Post–Pandemic City; Sustainability, Resilient, Urban Mobility;

## 1.0 INTRODUCTION

Cities are home to most of the world population and are centers of economic growth and innovation. However, the high concentration of people and activities in cities make them vulnerable to various stressors such as natural and man-made disasters. Understanding this, over the past few decades, a vast body of research has been published on the impacts of a wide range of disasters on cities, and necessary planning, recovery, and adaptation measures that need to be taken to deal with those disasters (Sharifi, 2020). While this is not the first time in the human history that pandemics affected cities, pandemics existed before the emergence of the COVID–19 pandemic (Matthew and McDonald, 2006). Urban research related to previous pandemics is mainly focused on issues such as inequalities that make poor and marginalized groups more vulnerable to pandemics (Wade, 2020). The recent pandemic has brought to the fore the issue of urban vulnerability to pandemics and has resurrected interest in this topic. As various forces such as climate change and human encroachment into natural wildlife habitats may increase the frequency of pandemics in the future, better knowledge of the underlying patterns and dynamics of pandemics, their effects on cities, and necessary preparation, response, and adaptation measures is needed (Connolly, Ali, Keil,

2020). In this regard, the recent pandemic offers an unprecedented opportunity to understand how cities might be affected by pandemics and what actions are needed to minimize the impacts and enhance urban pandemic resilience. Generally, population movement and transportation infrastructure that increase inter and intra-urban connectivity, are considered as key factors contributing to the spread of infectious diseases, and their role in previous diseases outbreaks (e.g., Ebola) has already been documented (Connolly et al., 2020).

### 1.1 Aim and Objectives

The aim of this paper is to focus on Kaduna State Government policies on Post–COVID 19 sustainable, mobility approaches with a view to applying physical planning solutions. The objectives of the paper are:

- i. To review WHO guidelines on mobility during the COVID–19 outbreak in relation to Kaduna State.
- ii. To identify the policies on Post–COVID–19 in Kaduna State.

- iii. To make physical planning recommendations that will transform Kaduna State Cities.

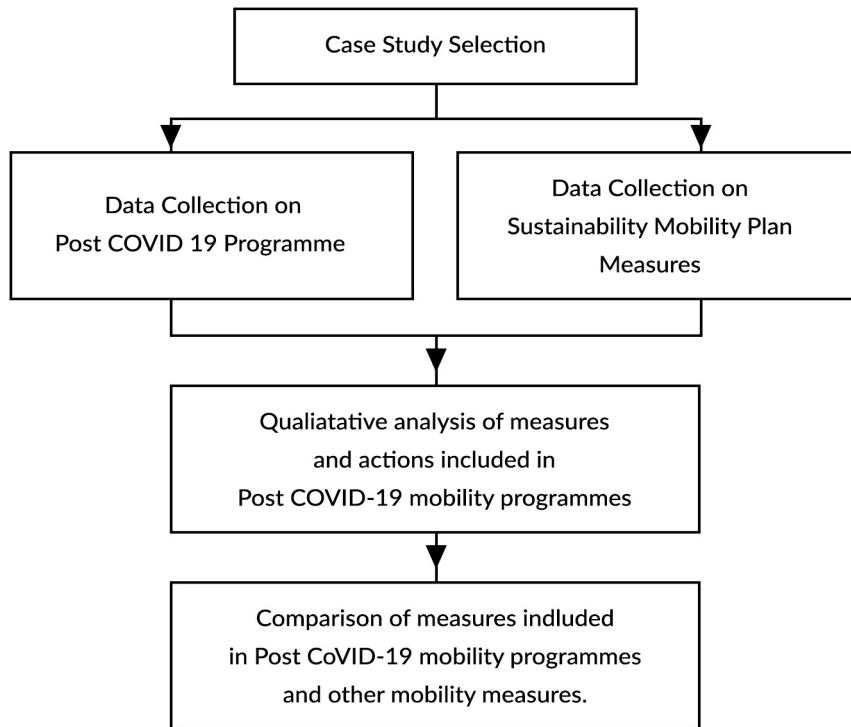
## 2.0 THEORITICAL FRAMEWORK

The World Health Organization (WHO) guidelines on mobility during the COVID–19 outbreak were mostly directed at creating more spaces for people. The WHO has promoted the use of non–pharmaceutical measures, like regular hand washing with soap under a running tap for at least 30 seconds (Alzyood Jackson Aveyard Brooke, 2020). The use of alcohol–based sanitizer to disinfect hands, social distancing, use of facemasks, gloves (personal protective equipment), self–isolation, the lockdown of cities, environmental decontamination, and waste management to limit the spread of COVID–19 from countries to countries, from cities to cities and person to person are standard practices (MacIntyre and Wang 2020). The key to prevention is an effective combination of different non–pharmaceutical measures by citizens and authorities, through appropriate risk communication of the danger of COVID–19 (Cohen and Corey 2020). There are also other modeling studies confirming the significance of mobility patterns/ restrictions for the spread/containment of the pandemic (Wu et , 2020). An overall decrease of 76% is reported in the city of Santander, Spain (Aloi , 2020); Bucsky (2020) indicated that the demand for transport had more than halved in Budapest, Hungary; in India, Saha (2020) observed significant reductions in retail and entertainment, supermarket and pharmacy, park visits, public transportation stations, and workplace mobility (by 73.4%, 51.2%, 46.3%, 66%, and 56.7% respectively); and, in the Netherlands, de Haas et al. (2020) found that, relative to the fall of

2019, the number of trips and the distance traveled fell by 55% and 68%, respectively. Severally the efficacy of travel restrictions assisted in containing the spread of the virus.

## 3.0 RESEARCH METHODOLOGY

The research method is based on the analysis of official acts concerning Post–COVID mobility, recently released by the State Government of Kaduna State. The goal is to build a framework that enables the comparison of policies carried out by Local Governments, highlighting approaches, challenges, design problems and critical issues (Figure1). Policies and measures are interpreted and evaluated in light of existing sustainable mobility policies as well as the contents of the Sustainable mobility plan already approved by Kaduna State Government. A description of Post–COVID measures undertaken by state, is illustrated figure below.



**Figure 1: Steps of the Method applied**

### 3.1 Type and Sources of Data

The primary data for this study was collected through direct field observation. The targeted population for the study included transport workers (drivers, road transport union workers and okada riders), petty traders at bus stops, fuel stations and farmers across the study area who had knowledge about the impact of the COVID–19 lockdown on their life. The data was obtained from Questionnaires.

## 4.0 RESULTS AND DISCUSSION

### 4.1 Kaduna State Government Policies on Post–COVID 19 Sustainability and Mobility

On 28 March 2020 Governor of Kaduna States, tested positive for coronavirus, having contracted the virus on a trip to Abuja. He subsequently infected further four people. However, Kaduna State had already begun to put measures in place as soon as the virus made landfall in the country. As a result, Kaduna was the first state to announce a lockdown starting on 25 March, 2020 three days before their first case. The lockdown prevented people from the Federal Capital Territory, Lagos, Kano and other parts of the country from entering Kaduna State. The initial

lockdown was for 30 days, and when it ended, it was extended for a further 30 days. The Deputy Governor, is a public health consultant, and so she and the Commissioner of Health, took charge of the situation right from the start. These two women had acquired much experience in controlling infectious diseases following their work against Ebola and Lassa Fever. They knew extraordinary measures had to be taken in their state immediately.

In Kaduna metropolis, the measure was achieved by avoiding the overloading of public transport and private cars. Also a homogenous awareness campaign was established in Kaduna State among policy makers and planners. Results in Kaduna State show that the number of daily certified cases of COVID-19 infections is strongly linked with the trips made in 21 days before noting that, this finding shows that the 14 day quarantine period set in many places, based on incubation-based approaches, may not be accurate (Cartenì, 2020). In order to contain the spread of COVID-19 many Local Governments in Kaduna State applied partial or complete mobility restrictions. Empirical evidence suggests a significant decrease in social mobility following the prevalence of COVID-19 and the adoption of travel restrictions. For example, NCDC (2020) reported 80% decline in daily trips after restrictions were introduced in Nigeria. Results show that restrictions on human movement have limited the spread of the virus in Nigeria (NCDC 2020).

#### **Table 1 to 5 indicate the effects of Covid-19 in Kaduna Metropolis**

SA= Strongly Disagree, A= Agree, MA= Moderately Agree, SD= Strongly Agree, D= Disagree,

SA	A	MA	SD	D	Total
535	400	50	5	10	1000
53.5	40	5	0.5	1	100%

**Source:** Field Survey (2021)

Concerning the effects of Covid-19 on transportation, 53.5% and 40% strongly agreed and agreed while (0.5% and 1%) strongly disagreed and disagreed, not living out that (5%) moderately agreed that Covid-19 led to increase in the cost of transportation in the study area (table 1). The cost of transportation increased rapidly especially when the lockdown and restriction on movement was imposed by the Kaduna State Government (KSTA, 2020). Some transport workers took advantage of that to enrich their pockets by collecting huge amount of money from passengers for a short distant journey due to the lockdown.

**Table 2: Restriction of Movement in Kaduna Metropolis Due To Covid-19**

SA	A	MA	SD	D	Total
550	420	10	5	15	1000
55	42	1	0.5	1.5	100%

**Source:** Field Survey (2021)

Table 2 reveals that majority of the (55% and 42%) strongly agreed and agreed while (0.5% and 1.5%) strongly disagreed and disagreed, not living out that (1%) moderately agreed that Covid-19 pandemic restricted many people from movement. The lockdown and restriction on movement prevented many people from going to their places of businesses during the pandemic. Even though those who were on emergency (sickness or labour) were allowed to move by the security personnel.

**Table 3: Loss of Jobs in Kaduna Metropolis Due To Covid-19**

SA	A	MA	SD	D	Total
600	270	70	15	45	1000
60	27	7	1.5	4.5	100%

**Source:** Field Survey (2021)

Table 3 reveals that most of the respondents (60% and 27%) strongly agreed and agreed while (1.5% and 4.5%) strongly disagreed, and disagreed except that (7%) moderately agreed that Covid-19 led to the loss of jobs by people. Many transport workers were prevented from their jobs. The lockdown forced many of the workers to park their vehicles in order to prevent the spread of the virus among individuals in Kaduna Metropolis.

**Table 4: Loss of Revenue by Government in Kaduna Metropolis Due To Covid-19**

SA	A	MA	SD	D	Total
850	70	80	0	0	1000
85	7	8	0	0	100%

**Source:** Field Survey (2021)

Table 4 reveals that most of the respondents (85% and 7%) strongly agreed and agreed while none of them strongly disagreed and disagreed except that (8%) moderately agreed that Covid-19 led to the loss of revenue by the government. Crude oil is the major source of revenue generation

in Nigeria which was affected by the coronavirus. This also affected the revenue generation in Kaduna Metropolis.

**Table 5: Covid–19 Led To a Reduction in Road Traffic Accidents (RTA) in Kaduna Metropolis**

SA	A	MA	SD	D	Total
738	62	120	1	79	1000
73.8	6.2	12	0.1	7.9	100%

**Source:** Field Survey (2021)

Table 5 reveals that 73.8% and 6.2% strongly agreed and agreed while (0.1% and 7.9%) strongly disagreed and disagreed with the exception of (12%) moderately agreed that Covid–19 led to reduction in road traffic accidents (RTA) in Kaduna metropolis. Road traffic accidents occur due to different factors such as wrong overtaking, over speeding, bad condition of the vehicle, or motor cycle, carelessness etc. Road traffic accidents used to be very high during the Ember months (September–December) across the country when people are going for Christmas festival and holidays in their villages or returning to the cities after the New Year break due to high level of vehicular movement on our high ways. But during the pandemic, the road traffic volumes reduced drastically in the Kaduna Metropolis due to the lockdown restrictions on movement imposed by Kaduna State Government.

#### **4.2 URBAN RENEWAL PROJECTS IN KADUNA METROPOLIS:**

Some of the components of urban renewal projects embarked upon by Kaduna State Government in Kaduna metropolis include the following among others: educational, health, commercial, recreational and transportation projects.

**TABLE 1: URBAN RENEWAL PROJECTS IN KADUNA METROPOLIS WHICH ASSIST IN REDUCING CONGESTION**

Project Use	Renewal Strategy	Renewal Project	Completion Status
EDUCATIONAL	Upgrading of Primary School	Renovation of building and provision of Learning facilities in all public primary school	100% Completed
		Construction of storey building L.E.A Rigasa	100% Completed
	Secondary School Renovation	Renovation of selected Public Secondary Schools	100% Completed
HEALTH	Universities Renovation	Construction and Renovation of Buildings in Kaduna State University (KASU)	100% Completed
	Upgrading of health centres and hospitals	Primary Health Centres (PHC) All PHC were renovated, provided with drugs, solar power and boreholes  Barau Dikko Hospital was upgraded to Kaduna State University Teaching Hospital (KASUTH)	100% Completed
COMMERCIAL	Newly constructed neighbourhood centres	Kamsalem Road	100% Completed
		Muhammadu Buhari Way	100% Completed
		Alkali Road	100% Completed
		Race Course	100% Completed
		Cultural Centre	100% Completed
	Newly constructed local markets	Kasuwan Magani Ultra Modern Market	90% Completed
		Kawo Market	90% Completed
		Kasuwan Barchi Market	70% Completed
		Ungwan Rimi Market	70% Completed

<b>RECREATIONAL</b>	New Park Construction	Newly constructed centenary park (opposite 44 military Hospital)	80% Completed
	Parks and Garden at strategic locations	Police Collage Roundabout	100% Completed
		NEPA Roundabout	100% Completed
		UTC Stores	100% Completed
		Sultan Bello Mosque	100% Completed

**SOURCE:** Field Survey (2021)

**TABLE 2: ROAD COMPONENTS OF URBAN RENEWAL PROJECT IN KADUNA METROPOLIS**

PROJECT USE	RENEWAL STRATEGY	RENEWAL PROJECT	LENGTH ( KM )	COMPLETION STATUS
<b>TRANSPORTATION</b>	Dualization of Roads	Rabah Road to Rigasa Train Station	37km	60% Completed
		Muhammadu Buhari Way	2.5km	100% Completed
		Yakubu Gowon Way to KASU Teaching Hospital	2.5km	100% Completed
		Alkali Road	1km	100% Completed
		Tafawa Balewa Way	5km	100% Completed
		Katuru Road	0.6km	70% Completed
		Isa Kaita Road	5km	100% Completed
		Swimming Pool Road	2.3km	70% Completed
		Polytechnic Road to Kasuwan Barchi	3km	100% Completed
		Race Course Road to Tafawa Balewa Way	1.2km	100% Completed
		Umaru Yar'aduwa Way (Millennium City)	6km	100% Completed
	Expansion of Road	Kabala Costain to Aliyu Makama Road	3km	80% Completed
		Urban Shelter Road to Yakowa Way	3.5km	100% Completed
		FRCN Road Malali to Legislative Quarters Ungwan Dosa	3km	100% Completed
		Shehu Laminu Road to Ramat Road Ungwan Rimi	1km	80% Completed
		Kakuri to Nasarawa Floor Mill Road	4km	80% Completed

	Kinshasha Road Ungwan Rimi	1.6km	80% Completed
Construction of Bridges	Kawo Overhead Bridge	1km	80% Completed
	Rabah Road Bridge	2km	60% Completed
	Leventis Underpass Bridge	1km	80% Completed
	Kabala Constrain Bridge	0.5km	80% Completed
Upgrading Access Roads	Numerous Access Road were upgraded in all Neighbourhood in Kaduna Metropolis which include Kawo, Tudun Wada, Kakuri, Barnawa, Narayi etc	Range from 0.3Km to 1Km	100% Completed

#### SOURCE: Field Survey (2021)

The educational projects comprised of upgrading primary schools, secondary schools and tertiary institutions. A primary school in Rigasa area was newly constructed with story buildings (the first of its kind in Kaduna state). Virtually all primary schools in Kaduna metropolis were upgraded in terms of their construction and learning facilities. The health facilities projects in Kaduna metropolis comprised of upgrading all Primary Health Centers (PHC) with their facilities. The former Barau Dikko Hospital was upgraded and converted to Kaduna State University Teaching Hospital (KASUTH), shown on plate 2 below. The commercial projects in Kaduna metropolis comprised of new commercial neighborhood and district centers located at strategic locations in Kaduna metropolis; upgrading of local markets such as Kawo markets and Kasuwan Barchi markets amongst others. Recreational projects comprised of construction of parks and gardens such as the centenary park opposite 44 Military Hospital and other recreational gardens spatially distributed at strategic locations in Kaduna metropolis. Transportation projects comprised of upgrading of access roads in residential neighborhoods, dualization of district roads, construction of pedestrians overhead bridges and walkway construction, expansion of Kawo overhead bridge, construction of Rabah road overhead bridge, linking Rabah road to Nnamdi Azikwe western bypass to Rigasa new railway station; and the construction of Leventis roundabout to overhead bridge and underpass in Kaduna central area ( plates 1,2,3, and 4 illustrate some of the urban renewal projects in Kaduna metropolis ).

## Urban Renewal Projects in Kaduna Metropolis



Plate 1: Sokoto Road showing Pedestrian Way



Plate 2: KASUTH and Golf Course



Plate 3: Katuru Road showing pedestrian way



Plate 4: Waff Road with pedestrian way

From table 1; it could be observed that, urban renewal projects in Kaduna Metropolis include also education, health, commercial, recreational uses and others. The projects contribute in reducing congestion from the usage of existing facilities in Kaduna metropolis. Reduction in congestion is part of COVID-19 Protocols and this supports Kaduna State Planning Standard that recommends specific number of people per facility. For instance, the planning for students per classroom in Kaduna State is between 30 to 40 Student. Following the COVID-19 Pandemic, Kaduna State Government is vigorously enforcing this standard in both public and private schools in the State. In the same vein, health, commercial, recreational and other land use activities are regularly monitored in Kaduna State to comply with planning standards, which at the same time ensures compliance with COVID-19 Protocols.

From table 2; it could be observed that road components of the urban renewal projects in Kaduna Metropolis constituted the greatest number of urban renewal projects in the metropolis. This is due to the fact that, road development in general suffered a set back in Kaduna metropolis,

since Kaduna Master Plan was prepared in 1967. Past Governors of Kaduna State neglected road construction, expansion and upgrading in Kaduna metropolis. In order to open up the desired growth and development of Kaduna State decided to give priority to accessibility which informed the heavy investment recorded in the sector. This is also in line with “Making Kaduna Great Again”. The roads greatly reduce traffic congestion in accordance with the provisions of Kaduna State Planning Standard which is also part of COVID-19 Protocols.

## 5.0 CONCLUSON

The adoption of Post-COVID 19 solution by Kaduna State Government is a positive response to urban challenges in the State because it enhances the cities resilience for the future. Post-COVID 19 experiences clearly raised the awareness of Local Governments and policy makers of the need for deep urban transformations based on green principles. Kaduna metropolis urban life quickly returned back to the usual rhythms of work, leisure and other social behaviors, because of the State Governments newfound awareness. Consequently, the COVID19 experience has become the starting point for a deep change in urban organization. In particular, urban mobility is going through a new kind of green revolution .

## 6.0 RECOMMENDATIONS

Based on Post-COVID 19 experiences the following recommendations are made:

Overloading in public and private vehicles are to be totally stopped in all urban and rural areas of Kaduna State. Kaduna State Transportation and Law Enforcement Agency (KASTLEA) is to ensure total compliance.

- i. Pedestrian ways, road markings as provided on newly upgraded roads in Kaduna
- ii. Metropolis have to be used and obeyed by pedestrians and motorists.
- iii. Recreational areas and parks provided at strategic locations in Kaduna Metropolis are to enhance the leisure and health condition of inhabitants of Kaduna Metropolis.
- iv. Building development ratios of 60%, 50% and 40% are to be complied within constructing high density, medium density and low density residential development in Kaduna Metropolis and other cities of Kaduna State. The remaining 40%, 50% and 60% of the plots are to be used for cross ventilation and aesthetic purposes.
- v. Occupancy ratio of 2.5 has to be observed in all residential buildings. Any form of congestion is no longer allowed in Kaduna Metropolis and other Cities in Kaduna State.
- vi. All gatherings in public uses such as schools, mosques, churches, commercial and recreational buildings and areas have to comply with COVID 19 protocols. Monitoring agents are to be deployed to these places to enforce and ensure compliance to the regulations.

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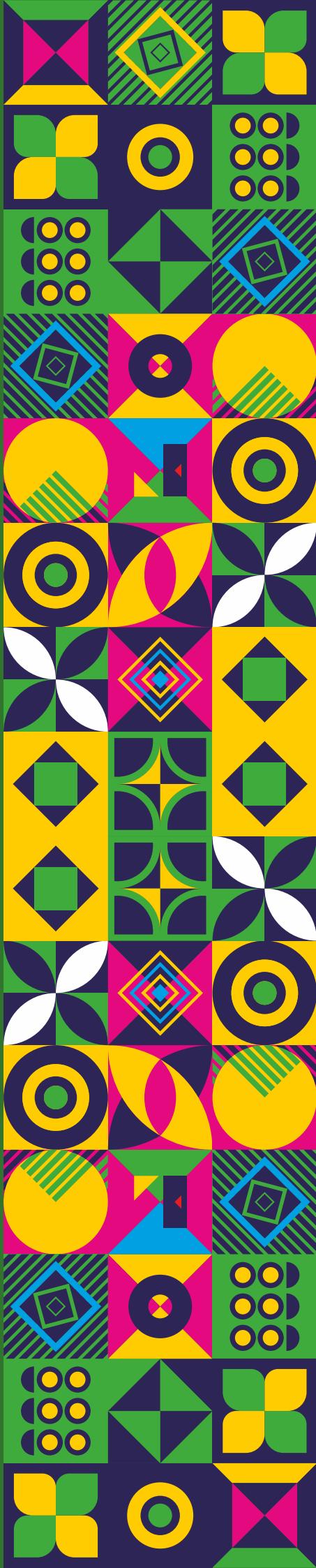
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## **SECTION FOUR**

# **Planning Human Settlements for Sustainable Urbanisation**



## CHAPTER THIRTEEN

# Spatial Pattern and Physiognomies of Slum in Ibadan, Nigeria

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### ABSTRACT

The rate of urban deterioration and proliferation of slum is becoming alarming, especially in developing nations of the world, including Nigeria. Slums are not distributed randomly in space. Rather some clustering of slums occurs due to certain social, economic, and environmental factors. The formation of urban slums is greatly associated with high poverty levels, the inadequate and prohibitive cost of essential urban services, substandard housing and environment, child abuse, high unemployment rates, school dropouts, and exposure to crime, insecurity, and violence, among others. The challenges of urban slum dwellers are further heightened by poor urban governance, inadequate pro-poor policy, and institutional framework. This paper highlights the magnitude, dimensions, and spatial pattern of slums using computed neighbourhood level slum index with local Moran's I statistics and ordinary least square (OLS) methods. Eight (8) factors were identified to compute slum index for each of the 109 neighbourhoods in Ibadan to aid the spatial patterning and mapping of slum in the city. The result identified statistically significant slum clusters comprising slums of varying degrees and their characteristics mostly around the city's traditional core and high-density neighbourhoods. Poverty, poor housing conditions, insanitary and health problems, crime, and insecurity, among others, were found to have a significant correlation with slum formation in Ibadan. The paper identified coping strategies to slow down urban

*deterioration and slum formation in Ibadan, Nigeria, and advanced roles for various stakeholders.*

**Keywords:** Slum, Cluster, Spatial pattern, Slum dwellers

## 1.1 Background

Doubtlessly, in recent times, Africa has experienced rapid urbanisation. The quality of structures that accompany this development varies from simple sheds to proper structures. The sequence of poorly built erection transforms the environment into a plague with poor sanitary conditions, high occupancy ratio, dilapidated structures, and eventually austere health challenges.

Slums have been defined in different ways; however, some characteristics tend to predominate in almost all the definitions regardless of the obvious variations. For instance, the United Nations (UN-Habitat, 2007) describes slums as areas usually inhabited by the urban poor, characterised by substandard dwellings, lacking basic social amenities such as clean water and regular electricity supply. This definition largely agrees with the definition of slum presented in Encyclopedia Britannica's (2021) as densely populated, dirty, run-down urban areas characterised by high social vices and poverty rates. This implies that slums are those areas of the underdeveloped part of the city and usually counteract the official urban plan. Slums are also conceived by Fourchard (2003) as blighted urban areas which feature predominantly urban people of low income and low educational attainments.

Similarly, the UN-Habitat (2003) defines a slum as 'a wide range of low-income settlements and/or poor human living conditions. The basic features of these settlements include poor environmental and living conditions characterised by an unhygienic environment, decrepit habitation and exposure to environmental pollution with grievous health implications (Morakinyo, et al, 2012). The UN-Habitat (2007) also defined slum as 'a heavily populated urban area characterised by substandard housing and squalor. A slum is, thus, a settlement heavily overcrowded and mainly characterised by poor living and environmental conditions. The settlement is sometimes temporary and is built using substandard materials such as plastic and tin sheets, cardboards etc. which do not stand the ravages of time. The government often recognises these settlements because they are situated on locations that are officially not planned for residential purpose. Hence, slum dwellers built houses that risk eventual demolition by either the government or legitimate owners of the land (Okafor and Onuoha, 2016).

## 1.2. Characteristics of Slum

Guillermo (2015), identified four key dimensions/characteristics of slums which include: Lack

of services, Agglomeration, Housing quality & Legal Aspects. Guillermo, further maintained that these dimensions could be observed in the attributes of slums, whereby slum settlers endure life threatening situations such as insecure tenure, poor supply of municipal water, poor or absent waste management policies, high presence of squalid and dilapidated shelters, nonexistent sanitary facilities, an array of complex health problems and lastly a persistent change in residential population, all of the foregoing which are categorised under the following Social, Economical, Political and physical attributes.

Urban slums may exhibit varying characteristics depending on the place and type of society where they are found. However, according to Makinde, (2012), there are some dominant features such as decaying structures, pervasive poverty, low-quality education, and invasive redundancy that cut across urban slums worldwide. Makinde, (2012) view was in agreement with a later study by Njoku and Okoro (2014) that stated that slums are the physical manifestation of urban decay, abject poverty and unemployment, Njoku and Okoro (2014) view also is in line with an earlier study by Chandramouli, (2003), which identified that the shortage of infrastructure and essential social services, dilapidated buildings, overpopulation and bad living conditions as the basic features of slum areas.

UN-HABITAT's has the most detailed description of slums, where it describes a slum household as one that lacks one or more of the following items: access to improved water or sanitation; security of tenure; durability of housing and sufficient living space. These factors perfectly describe conditions of urban slums where the local authorities do not offer any services to the people because they believe that they are not legally bound to cater to these blighted areas (UN-HABITAT, 2007). This implies that the conception of slums as illegal settlements mostly by the constituted authorities largely contributes to the plight of slum dwellers as they are largely not budgeted for by the government in terms of the provision of infrastructure and other essential services.

Omole and Owoeye (2011), on the other hand, conceived the physical characteristics of slums as areas that breed criminality and harbour delinquent offenders. Thus, slums are often seen as the breeding ground for the good, the bad and the ugly aspects of urban lifestyle. They are manifestations of most social problems occurring in cities and largely serve as hideouts for criminal gangsters. Hence, many policymakers and even researchers consider clearance and rebuilding of slums as one effective strategy of getting rid of urban decay and social vices (Omole, 2000). In support of (Omole) 2000, Njoku and Okoro (2014) argued that high criminality rates in the form of drug abuse and alcoholism and psychological issues resulting in suicide are some of the social problems identified with urban slums in Nigeria.

### 1.3. Categorisation of Slum

Okafor and Onuoha (2016), cited the review of Bergal (1965), where slums were divided slum into three (3) broad classes, which are; original, departure and transitional slums. The original slum was described as a slum that is characterised by unbefitting and dilapidated housing structures which actually require clearance and rebuilding. Examples of such slums type are commonly found in the Nigerian cities of Lagos (such as Makoko and Ajegunle), Ibadan (such as Agbokojo, Beere, Ojee and some part of Agbowo-Bodija). Departure type of slum was described as slum which are resulted from the mass flee of middle and upper-class families from the original area to another location.

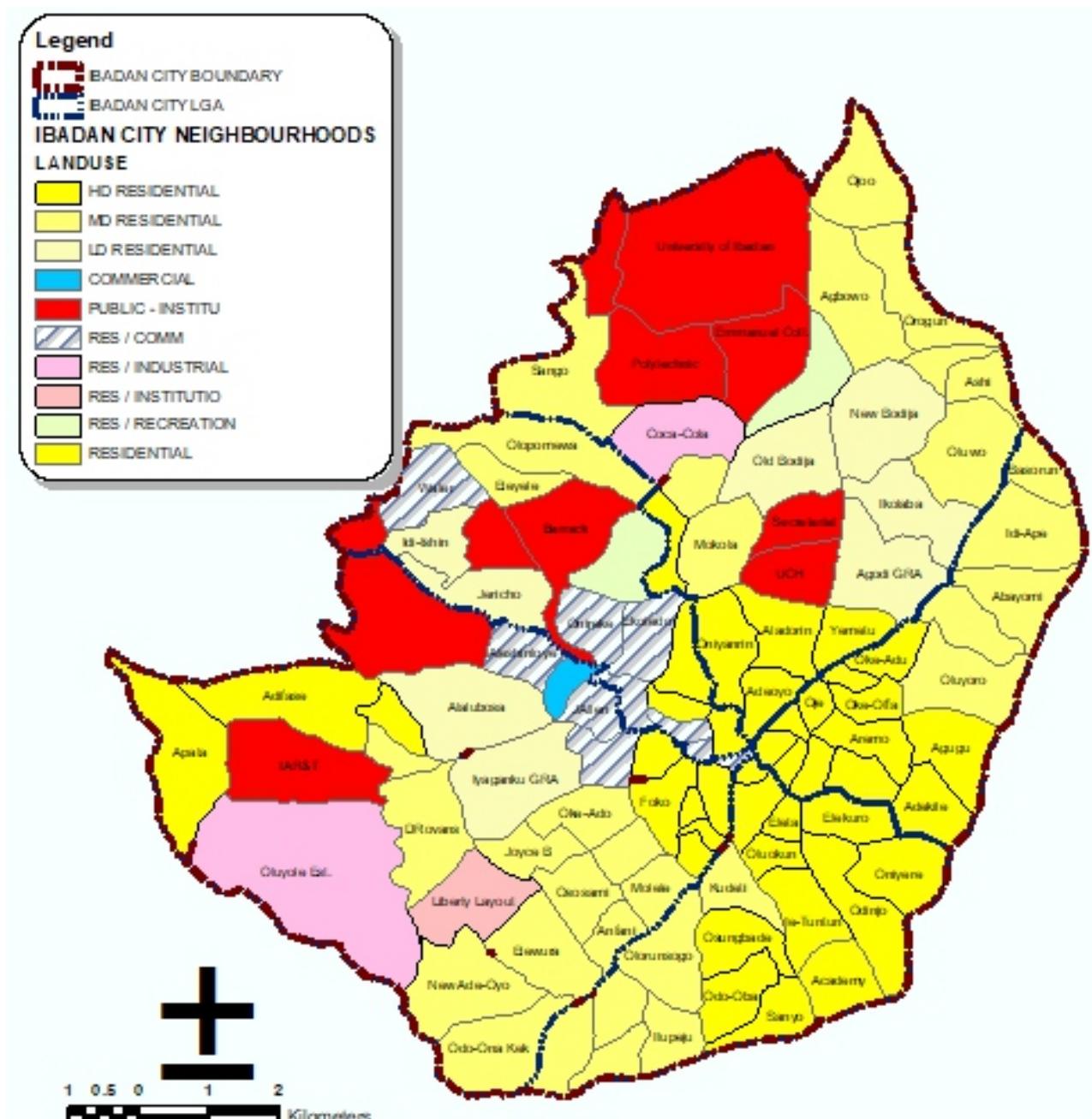
Traditional and spontaneous type of slums was identified similarly by Agbola (1987), as the two types of slums in Nigeria. Traditional slums are the types of slum generated as a result of urban decay while spontaneous slums are that types of slum where squatters erect structures on lands that were acquired illegally. Moreover, according to Makinde (2012), in the later study on Ibadan central city slums, he argued that not all spontaneous slums evolved on illegally acquired lands as some slums in Ibadan, for instance, developed outside the core city on legally acquired lands. He further divided slums into four (4) categories: inner-city slum, slum estate, recent slums and peripheral slums. The inner-city slum, according to him, occurs when the original inhabitants of the areas, most of whom are well-to-do urban dwellers, move to more classy and newer urban locations; the movement usually takes place as a result of improved socio-economic and commercial activities in the city centre which attracts an influx of migrants from rural areas seeking jobs in the manufacturing industries. Accordingly, those areas that were vacated by the middle and high-income urban dwellers, with the possession of social amenities, are occupied by the urban low class and new city entrants. The second slum type identified by Makinde (2012), is the slum estate that he explained as instance housing estates erected by either public or private parastatals to provide accommodation for civil servants or industrial workers. Rise in population over time make the housing structure to be overcrowded and this make the few available services to become strained. The third type of the slum identified by Makinde (2012), is the recent slum and is extremely different from the previous types that have been explained. Recent slum type is newer in contrast, and their newness is in terms of the material used for erection, they are usually the inferior materials, such as corrugated metal sheets, cardboard cartons etc. In this type of slum, there is less competition for land; hence, the density is low compared with other types of slums. Recent slums form on the margin of the city. They often use grid-iron layout so well that in most instances, they attract the recognition of urban authorities and their services and consequently become immune to demolitions. Peripheral slum, the fourth slum type identified by Makinde (2012), results from either invasion of public land by dwellers of squatter settlements or land occupied after payment or making a rent purchase arrangement with the landowners, they are usually large as they are located at distances far from the core city and have a relatively high quality of housing, accessibility problem to working place, markets,

schools and many social places are the problems of Peripheral slum settlement.

## 2.1 THE STUDY AREA

Ibadan, the capital city of Oyo State is located in the south-western part of Nigeria within Longitude 7°2' , Latitude 3°35' and Longitude 7°40'E, Latitude 4°10'N (Fig. 1). The city founded in 1829, has grown rapidly both in area and in population from only 1km<sup>2</sup> in 1830 to 12.5 km<sup>2</sup> in 1931, 30 km<sup>2</sup> in 1963, 112 km<sup>2</sup> in 1973, 136 km<sup>2</sup> in 1981 and 214 km<sup>2</sup> in 1988 (Ayeni, 1994). By the year 2000, it was estimated that Ibadan covered 400 km<sup>2</sup>, sprawling out to a radius of 12–15km along the primary roads.

The city is predominantly residential with 109 neighbourhoods out of which 88 are residential, with the remaining 21 shared by commercial, public and institutional land uses as indicated in figure 1. There are a total of 48, 38 and 23 High, Medium and low-density neighbourhoods, respectively. Most of the High-Density neighbourhoods are located within and around the unplanned core area of the city. The unplanned-core of the city are located mostly in the southeastern part, predominantly inhabited by the indigenous population of the city in Beere, Oja'ba, Labiran, Oje, Inalende, Opo among others. This zone developed in compacted nature without access or space in between buildings resulting in ventilation and accessibility problems, few available roads are narrow and usually without drainage channels (Ipungbemi, 2009). The medium density area are mostly located in the southern and Northern part of the study area around Oke-Ado, Molete, Adeoyo, Mokola, Agbowo and other similar neighbourhoods. Low-density neighbourhoods are found around the western and northern parts of the city. These include GRAs at Agodi, Jericho, Iyaganku, Alalubosa and Oluyole and Bodija Estates



**Figure 1: Dominant Land Uses in the 109 Neighbourhoods**

(Source: Ministry of Lands and Housing, Ibadan, 2017)

### 3.1. Methodology

*Data collection methods:* The research data were sourced from both primary and secondary sources. Secondary were collected from National population commission (NPC) and National Bureau of Statistics (NBS) and Oyo State ministries and parastatals. Questionnaires were administered to collect primary data from 1,526 respondents spread across the entire 109

neighbourhoods within the city. This is to build data for each neighbourhood towards developing the slum index.

*Selection of indicators for data analysis:* Eight (8) indicators on socio-economic and physical characteristics of slums were adopted to determine the availability of slum in residential neighbourhoods of Ibadan. These variables were used to generate the slum index for each of the 109 neighbourhoods in Ibadan to measure the degree of presence of slum in these neighbourhoods. These variables are—Proportion of Population Without Higher Education (PRONOED); Proportion of Unemployed (PERUNEM); Median Income (Households Heads) of Neighbourhoods (MEDINCO); Proportion of Building requiring Major Repair (MAJREP); Proportion of dwellings with Poor Water and Sanitation (PROPWASH); Building Density (BUILDENS); Neighbourhood Disorder / Incivility index (CRIMINC); and Proportion of Buildings without Access Road (NOACCESS). These variables according to UN-Habitat (2003); Makinde (2012), (Omole) 2000, Njoku and Okoro (2014); Alves (2015) and a host of other studies, have proven to be the determinants of slum in urban neighbourhoods.

*Data analysis Methods:* Both data were sorted out, with the primary data coded and inputted into the computer and analysed using the Statistical Package for Social Sciences (SPSS) software. Statistical analytical attributes of the SPSS used included frequency analysis, factor analysis, Ordinary Least Regression and Pearson's correlation. Factor and Principal Component Analysis was conducted to determine the slum index for the 109 neighbourhoods using the 8 variables adopted as measures of slum occurrence: Factor analysis is a technique used to reduce a large number of variables into fewer factors. This technique extracts maximum common variance from all variables and puts them into a common score. Several methods are available, but the principal component analysis was used in this study. The factors analyses were produced using SPSS software. The eight (8) selected socio-economic variables were standardised and reduced into one component with Factor Analysis. The factor scores served as slum index mapped with ArcGis 10.8 Software to determine the incidences of slum within the study area. The study used a mean analysis to determine the data's central location (average). The standard deviation was calculated to determine the data set's variability and spread, as well as the relationship between the mean and the remaining data.

## 4.0. Discussion and Findings

### 4.1 Analysis of the Characteristics of Slums and Slum Dwellers in Ibadan

The study collected primary data on the types of houses occupied by residents of the sampled slums, the building materials used in their construction, and their housing tenure status to elicit information about slum housing characteristics. It also collected data on household population, education, employment, income level etc.,

### *Socio-economic and demographic characteristics of slum dwellers:*

According to the study, approximately a third (38.5 percent) of slum dwellers have up to three children, while 3.2 percent have no children at all. Over half (58.3 percent) of the slum dweller population sampled had more than five (5) children. The average household size was seven (7) across the study area. This situation is concerning in the light of the housing conditions that these large families must endure, despite the harsh social and economic conditions prevalent in these slums. The data also show 53.8 percent of the respondents is illiteracy rate, with only 19 percent of slum dwellers attaining some form of tertiary education. With such a low educational attainment, the slum dwellers' chances of finding formal employment is very limited. The majority of slum dwellers (53.1 percent) are self-employed, with only 8.5 percent employed in various low-wage government jobs.

The study showed that 87.3% of the sampled slum dwellers earn less than N30,000 per month. Which is national average of N30,000 (national minimum wage). Those earning below this minimum wage varies from 46.7 percent earning less than N10,000 per month, 24.9 percent earning less than N20,000 per month and 16.1 percent earn less than N30,000. Only 12.3 percent of the slum dwellers sampled earned more than the minimum wage of N30,000.

*Relationship between housing types and secure tenure with socio-economic characteristics of slum dwellers:*  
The study used the data collected to analyse the relationship or correlation between housing types and socio-economic characteristics of slum dwellers. The data collected shows that 64 percent of the slum dwellers live in permanent structures; 24.7 percent live in semi-permanent structures, while only 11.3 percent live in temporary structures. All of the houses lacked basic infrastructure such as water, sanitation and waste disposal.

According to the study, 46.7 percent of all slum houses in Ibadan were constructed using mud, 27.3 percent with sandcrete blocks roofed with aluminium, and 26% with salvaged materials such as wood, roofing sheets used as walls, and an assortment of other materials. The analysis shows that most slum housing units are low-quality permanent structures constructed primarily of mud/claybrick materials with corrugated iron sheets roofings and other salvaged materials. The majority of slum dwellers live in rented housing structures, with only 21.3 percent owning their homes.

Additionally, an analysis of land tenure systems in Ibadan slum dwellings revealed that 38% of all slum dwellers were renters, 31.3 percent were non-renting occupants, 21.3 percent were house owners, and 9.3 percent were caretakers.

#### 4.2 . Results of Factor Analysis of 8 Indicators of Socio-Economic and Physical Characteristics of Slum Dwellers

The correlations between the 8 variables selected for study are presented in Table 1. The result shows the chosen , the variables are positively and highly correlated with each others. However, MEDINCO is negatively correlation with other variables, indicating that the lower the income of household heads, the higher the incidences of other variables in the neighbourhoods. For instance, the lower the family income, the lower the proportion of building requiring major repairs; high building density; no accessibility; proportion of building with no potable water and sanitation and incidences of crime and incivility.

**Table 1: Pearson Correlation Matrix of Slum Indicator Variables**

	PRONOED	PERUNEM	MEDINCO	MAJREP	PROPWASH	BUILDENS	CRININC	NOACCESS
PRONOED	1.000							
PERUNEM	.745	1.000						
MEDINCO	-.863	-.701	1.000					
MAJREP	.867	.687	-.762	1.000				
PROPWASH	.718	.541	-.691	.744	1.000			
BUILDENS	.672	.549	-.624	.727	.603	1.000		
CRIMINC	.875	.767	-.899	.806	.776	.680	1.000	
NOACCESS	.831	.678	-.761	.904	.724	.752	.837	1.000

**Table 2: Result of the Principal Component of the 8 Indicators Matrix for Socio-Economic Variables**

Variable Code	Component Matrix <sup>a</sup>		Component 1
	Variable Name		
PRONOED	Proportion of Population Without Higher Education		.936
PERUNEM	Proportion of Unemployed		.802
MEDINCO	Median Income (Households Heads) of Neighbourhoods		-.897
MAJREP	Proportion of Building requiring Major Repair		.924
PROPWASH	Proportion of dwellings with Poor Water and Sanitation		.821
BUILDENS	Building Density		.791
CRIMINC	Neighbourhood Disorder / Incivility index		.944
NOACCESS	Proportion of Buildings without Access Road		.923

### Extraction Method: Principal Component Analysis.

- a. 1 components extracted.

The various correlation coefficients are as presented in Table 2. All the variables were strongly correlated with Component 1, while only MEDINCO is negatively correlated with the components. The correlation coefficient varies from -0.897 to 0.936,  $p < 0.05$ . The correlation coefficient of MEDINCO is -0.897,  $p < 0.05$ . Since all the variables are positively correlated with Component 1, it is adopted as a measure of Slum Index for each of the neighbourhoods. The factor scores generated for each of the 109 neighbourhoods was used to map the prevalence of slum in the study area.

Mapping of the slum index (SI) of neighbourhoods was carried out in ArcGIS environment using the factor scores recorded for each of the neighbourhoods. Figure 1, therefore, presents the incidences and levels of slum in Ibadan city.

#### 4.3. Incidences Of Slums In Ibadan

Figure 2 is the map of slum incidence index for the residential areas of Ibadan that have been studied. The maps shows 24 neighbourhoods around the traditional core area and some high-density neighbourhoods records high slum index and are tagged Full slums Neighbourhoods. These are the neighbourhoods with high occurrence of poor housing, inadequate infrastructure, lack of potable water and sanitation and low socio-economic status. Some of these neighbourhoods are; Bere, Itabale, Labiran, Oja-Igbo, Eleta, Elekuro, Oniyarin, Inalende, Idi-Ikan, Agbeni, Oja-Oba, Isale-Osi and a host of other similar neighbourhoods. There were fifteen other neighbourhoods with Deteriorated conditions close to the Full slum neighbourhoods. These neighbourhoods are found around the core area close to the 24 full slum neighbourhoods in Adeoyo, Oje, Arewo, Orita-Aperin, Adekile, Kudeti, Foko, Sabo and other similar areas. These also have high slum index but not as high as the 24 neighbourhoods in the first category. There are twenty (20) neighbourhoods with decaying characteristics next to those categorised as Deteriorated. They are outside the traditional core but within the high-density area of Ibadan.

They formed the transition zone between the core area and the Low-density neighbourhoods. These neighbourhoods are scattered within the study area. Some of them are; Agbowo, Sango, Mokola, Abayomi, Ekotedo, Eleyele, Ekotedo, Oke-Ado, Molete, Elewura, Felele, and a host of others. This analysis implies that sixty-eight (68) neighbourhoods out of the 109 neighbourhoods in the city exhibited different levels of slum. They are mostly found within and around the traditional core area of the city.

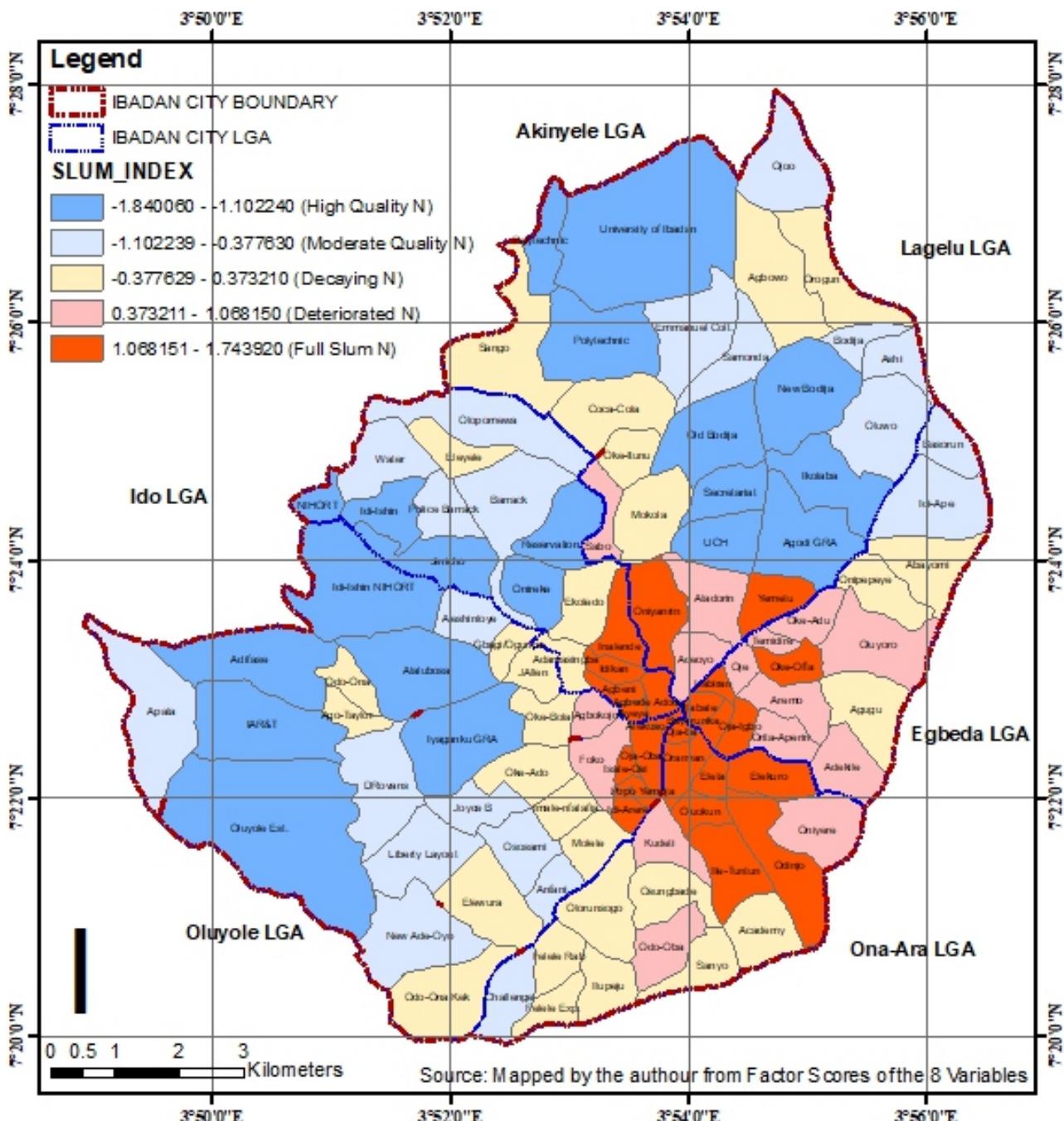


Figure 2: Slum incidence in Ibadan city

Source: Mapped from the factor score of the 8 variables

It shows 21 neighbourhoods with a moderate slum index within the study area. These areas are within the medium and low-density neighbourhoods within the city of Ibadan. They are areas with better socio-economic status, fair physical infrastructure and quality of housing. These neighbourhoods can be found in Samonda, Oluwo, Ashi, Basorun, Idi-Ape, Olopomewa, Aleshinloye, Ososami, Challenge, Apata and other similar areas.

The map also shows 20 neighbourhoods mostly in the Low-density neighbourhoods with

high-quality housing, good infrastructure and high socio-economic status. They are Old and New Bodija, Agodi GRA, Jericho, Alalubosa, Iyaganku GRA, Adifase, Oluyole Estate, IAR&T, University of Ibadan and The Polytechnic, Ibadan.

Figure 3 showsd the hotspots of slum areas in Ibadan. There are 30 of these hotspot neighbourhoods significant at 99% confidence level (coloured deep red), 9 neighbourhoods at 95% confidence level (red); and 3 at 90% confidence level (light red). The figure shows 42 hotspots of slum, which are area clustered around the traditional core part of the city. The hotspots map indicated that slum is prevalent in the high-density neighbourhoods within the core/high-density parts of the city spanning the five (5) local government areas in the city.

The spatial-autocorrelation analysis to determine the autocorrelation of neighbourhoods with slum occurrence in the study area was conducted, the analysis revealed a Z score value of 22.25which indicate a clustered pattern of slum within the study area with Moran I value of 0.95,  $p<0.01$  indicating a high degree of clustering of slum neighbourhoods in the study area. This indicates that many neighbourhoods with similar indicators and levels of slum are clustered in the same area within the Ibadan city.

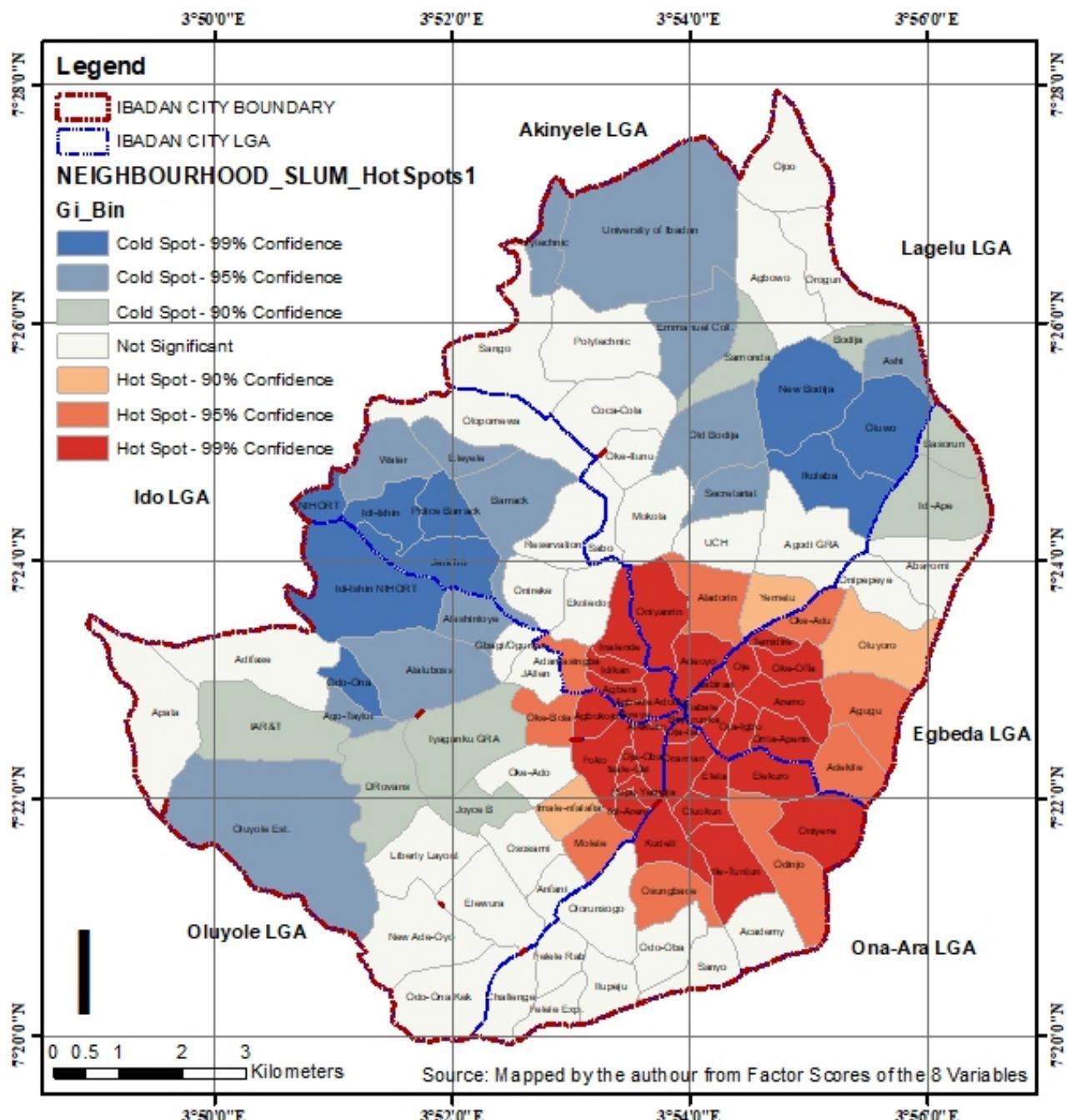


Figure 3: Hotspots of slum in Ibadan

Source: Mapped from the factor score of the 8 variables

#### 4.4. Predictors of slum in the study area

Ordinary Least square regression analysis was conducted to determine the predictors of slum among the variables and how they jointly explain the variability in the occurrence of Slums within the city. It was discovered that all the variables are significant predictors of the slum with  $P < 0.01$ . The  $R^2$  value of 1. Since an  $R^2$  of 1 indicates that the regression predictions perfectly fit the data and indicate no error in the regression. Therefore, it can be concluded that all 8

variables perfectly predicted slums in Ibadan city.

**Table 3: Summary of Least Square Regression of the 8 Slum indicators variables**

<b>SUMMARY OF OUTPUT: ORDINARY LEAST SQUARES ESTIMATION</b>	
Dependent Variable: SLUM_INDEX	Number of Observations:109
Mean dependent var:3.66972e-007	Number of Variables:9
S.D. dependent var: 0.995402	Degrees of Freedom:100
R-squared: 1.000000	F-statistic:2.72474e+008
Adjusted R-squared: 1.000000	Prob (F-statistic): 0
Sum squared residual:4.95459e-006	Log likelihood : 766.742
Sigma-square:4.95459e-008	Akaike info criterion:-1515.48
S.E. of regression:0.000222589	Schwarz criterion:-1491.26
Sigma-square ML:4.5455e-008	S.E of regression ML: 0.000213202

#### **4.4. Characteristics of Slum in Ibadan**

The study examined the types of houses occupied by residents of the sampled slums, the building materials used in their construction, and their housing tenure status to elicit information about slum housing characteristics. According to the study, approximately a third (38.5 percent) of slum dwellers have up to three children, while 3.2 percent have no children at all. Over half (58.3 percent) of the slum dweller population sampled had more than five (5) children. This situation is concerning in light of the housing conditions that these large families must endure, despite the harsh social and economic conditions prevalent in these slums. This results in a 53.8 percent illiteracy rate, with only 19 percent of slum dwellers attaining some form of tertiary education.

As expected, slum dwellers' chances of finding formal employment are dwindling. The majority of slum dwellers (53.1 percent) are self-employed, with only 8.5 percent employed in various low-wage government jobs. As might be expected, unemployment is exceptionally high in slums.

As expected, slum dwellers' average monthly incomes were significantly lower than the national average of N30,000 (national minimum wage). Income levels of slum dwellers in the sampled slums revealed a significant percentage of 46.7 percent earning less than N10,000 per month and another 24.9 percent earning less than N20,000 per month. 16.1 percent earn less than N30,000, while only 12.3 percent earn more than the minimum wage of N30,000.

The study examined the housing types found in Ibadan's slum areas in relation to socio-economic and housing characteristics. According to the study, the majority (64 percent) of Ibadan's slum

dwellers live in permanent structures. 24.7 percent of people live in semi-permanent structures, while 11.3 percent live in temporary structures. All of the houses are substandard and lack basic infrastructure. According to the study, 46.7 percent of all slum houses in Ibadan were constructed using mud, 27.3 percent with sandcrete blocks roofed with aluminium, and 26% with salvaged materials such as wood, roofing sheets used as walls, and an assortment of other materials. Additionally, an analysis of land tenure systems in Ibadan slum dwellings revealed that 38% of all slum dwellers were renters, 31.3 percent were non-renting occupants, 21.3 percent were house owners, and 9.3 percent were caretakers.

The study used a mean analysis to determine the data's central location (average). The standard deviation was calculated to determine the data set's variability and spread, as well as the relationship between the mean and the remaining data. Additionally, it calculated the standard deviation's relationship to the mean, also known as the coefficient of variation (CV). The analysis revealed that the coefficients of variation for all responses, including Type of House (CV=3.81), Building Materials Used (CV=9.46), Housing Tenure Status (CV=2.28), and Land Ownership (CV=7.05), were relatively low, indicating a high degree of consistency with respect to the variables used to assess the nature and economic characteristics of slum dwellers. Thus, these findings indicate that the majority of slum housing units are low-quality permanent structures constructed primarily of mud/claybrick materials with corrugated iron sheets roofings and other salvaged materials, and that the majority of slum dwellers live in rented housing structures, with only 21.3 percent owning their homes.

### **5.1. Conclusions and Recommendations**

This study has helped us to know what are the essential socio-economic, demographic and housing characteristics that define slum dwellers and slum neighbourhoods. In particular, it has helped us to see the spatial distribution of slums among the 109 residential neighbourhoods selected for the study. Through it we know the worst, the ugly and the good housing areas. It recommended that the worst slums should be earmarked for clearance while the moderately substandard housing areas should be upgraded. In the National Housing Policy and the National Urban Development Policy revised in 2012, the government is committed to promoting access to adequate shelter for all Nigerians. The country is also committed to promoting the urban renewal of all slums in the country.

The study analysed the socio-economic and demographic characteristics of slum dwellers and the spatial distribution of slum in residential districts in five local government areas of Ibadan metropolis.

The result of the mapping of slum shows that slums exist at various levels throughout the city's core area and high-density neighbourhoods. It is recommended that government should promote

slum upgrading in the areas and in exceptional cases, carry out spotclearance if the need arises.

Concerning socio-economic characteristics, the analysis shows that the income of the slum dwellers is significantly lower than the national minimum wage of N30,000. There is the need to review the minimum income paid to workers as most of these people live in slums. There is also a need for the government to promote local economic development and promote the establishment of industries to boost the economy. It is also important for the government to assist the slum dwellers for income generation, especially those informal sectors, men, women and youth, by creating places for their business such as creating markets, local shops and business incubator centres for their operations. In collaboration with financial institutions, the study recommends that the government develop financial packages for slum dwellers to increase their access to capital for small-scale businesses and structure renovation. This would significantly increase the meagre monthly income (less than N30,000) earned by self-employed slum dwellers.

It is recommended that the government recognise slums as settlements that can be improved and earmarked for demolition. Thus, the government should provide water, roads, and electricity in existing slums to raise the standard of living and improve the daily lives of slum dwellers. According to the finding of the study, the majority of slum dwellers are illiterate or have received only rudimentary education. Apart from social amenities, the study recommends that the government establish slum-dwelling schools and other educational facilities near the slums to ensure that the children of slum dwellers have access to education as well, to break the cycle of illiteracy and poverty.

In case of slums that are among the worst, the government should promote clearance that respects the rights of slum dwellers by ensuring that they are properly re-housed within the same site. Additionally, the government should collaborate with financial institutions to develop financial packages for slum dwellers to facilitate their access to capital for small-scale businesses. This has the potential to improve the socio-economic conditions of slum dwellers significantly.

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# Usage of Non-Motorised Transport (NMT) for Intra Urban Travel

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### Abstract

*Over the years the use of non-motorised transport in urban areas is gradually disappearing while automobiles are dominating short and medium trips within cities of a developing country. With the attendant negativities of traffic congestion, delay, environmental pollution, the world is focusing on sustainable transport, clean air, and a liveable city. This study aims to examine usage of Non-Motorised Transport (NMT) modes to examine NMT trip rate, level of usage, and causes of use and non-use. Observation and questionnaire survey were employed, manual classified traffic counts were conducted at 3 major nodes within Abeokuta and 563 intercepted commuters were interviewed with the aid of a structured questionnaire. Results revealed that non-motorised trip rate is 17.1% while motorcycle is 51.1%, cars, and taxi 33.2% while others accounted for 5.5%. NMT has 23.1% of modal split, of which 92.3% is walking, cycling and wheelchair makes up 7.7%, while 72% of the total sample uses NMT as last-mile mode. Some 4.9% do not use it at all. The need to stop before final destination 31.4% and cost of motorized transport 28% were the two most significant factors of use while the availability of alternative mode 75.4% is the most significant cause of non-use of*

NMT. The study concludes that access to para-transit is the significant cause of reduction in the use of NMT in urban areas and the creation of intervening street activities could stimulate walking and cycling. It recommends restrictions on para-transit use and the promotion of mix-used in urban land use planning.

**Keywords:** Non-motorised, sustainable transport, paratransit, pollution, trip rate.

## 10. Introduction

Non-Motorised Transport (NMT) is an important element of the urban transport system, its role in urban mobility is well acknowledged in the provision of first and last-mile transit, especially of feeder services to public transport mode. In some continents of the world, non-motorised transport served as major transit mode use for daily obligatory trips like journey to school and workplaces, while it serves recreational purpose in some other countries like the United States of America (Servaas, 2000). However, at one point or the other non-motorised transport is required to connect either public or private transit, hence, it is an integral part of the urban transport system. Scholars have conceptually defined non-motorised transport as an active mode of transport that involves the use of human energy to power, some also regard it as a traditional or natural mode of movement that humans begin are endowed with. Except for people with disabilities, walking is a common characteristic of human beings; other forms of non-motorised transport are cycling, wheelchairs, etc.

The use of non-motorised transport is prominent in most African countries, especially in Nigeria. Walking and cycling are the major means of mobility, until the early 70s when wages increase occasioned by oil boom cause influx of automobile (John 2015), this trend continues with improvement in the purchasing power of Nigerian, more vehicles were imported into the country and streets of the cities became congested with cars, resulting in traffic gridlock, delay and loss of man-hour to traffic congestion. As high cost of fuel consumption, pollution, traffic congestion and increase in the cost of transportation became common problems in urban settlements, and as a way of overcoming these problems, powered two and three-wheeler were introduced to the public transport system in the late 80s. This is because of their ability to maneuver in the traffic and ability to access interior part of the city among other benefits. Government, non-governmental organization, and individuals promote the use of motorcycles through various empowerment programme which leads to increased use of motorcycles as a public transport mode.

The effort at promoting the use of non-motorised transport such as walking and cycling was

minimal, few road designs have non-motorised facilities integrated, planners, engineers seldom considered this in their design (Parida & Parida, Not dated). A formal minister of transport Ojo Madueke made effort to reintroduce bicycle use through his effort by riding a bicycle to the office and lunch a park and ride campaign on the campus of Lagos state university and donated a bicycle to the university. This effort at encouraging the use of bicycles was later sustained by the federal road safety corps through their programmes which include, the inauguration of cycling stakeholder forum, development of national cycling policy and strategy 2014–2017, and the creation of non-motorised transport unit in the commission.

Despite these efforts, the use of non-motorised transport mode has drastically reduced and the continuous disappearance of the mode from urban transport system, despite its benefit and contribution to urban mobility is being investigated, this study aims to examine the usage of NMT modes within the urban setting and assess NMT trip rate, level of usage and causes of use and none usage of the mobility option.

## 2.0 Literature Review

The use of the automobile in bridging the gap between different places of activities became apparent as there is a need to separate conflicting land uses through zoning of compatible uses, hence residential areas were separated from industrial areas to minimize the likely effect of a pollutant that may be generated from industries to home. Since the invention of the automobile, its negative externalities have raised concern for its influence on the environment, liveability, and quality-of-life of people as a result of the attendant problems of traffic congestion, emission of pollutants, and the use of non-replenish resources. In other, to save the environment the negative externalities of the motorized transport need to be discouraged (Sinnett et al, 2011)

The need for sustainable transport globally calls for having realized the contribution of automobile use to global environmental degradation, sustainable transport is therefore seen as a viable option. Non-motorised mode as a sustainable transport provides access to people, places, goods, and services in an environmentally responsible, socially coherent, and economically feasible way, it is also an integration of public transport and the various means of non-motorised transport such as walking and cycling (Parida & Parida, Not dated). Ibrahim & Fosudo (2018) see non-motorized transport as sustainable active mobility which includes walking, cycling, and riding a personal mobility device (PMD) such as the scooter, rollerblade, skateboard, and wheelchair.

Parida & Parida (Not dated) identified the inherent qualities of NMT as non-fuel dependent and non-polluting make it an environmentally friendly and sustainable transport option. NMT depends on human energy which is replenishable. Hence, its uses significantly reduce the use of non-renewable resources (Litman, 2007) and promote a clean environment. Walking and cycling in most developing countries are important means of transportation, especially in the

low-income country, its benefits are enormous to individual and society at large. Salleh et al (2014) identified the significant importance of NMT as providing links between homes and public transit, car parks, and destinations; it increases neighbourly interaction and community relations; it also supports patronage of commercial shops such as restaurants which stimulate pedestrian activities. Corroborating Salleh, Burden et al (1999) concluded that the liveability of communities partially depends on how convenient it is to cycle and walk within the neighbourhood.

Cooke et al (2017) defined non-motorised transport as a sustainable mode of transport that has several benefits for urban communities, he identified the health benefits to individuals as a result of active energy input which increases cardiovascular fitness, decreases stress levels, and lower risk of obesity (Macmillan et al, 2014). Reduction in traffic congestion, air, and noise pollution, and improvement in road traffic safety have been acknowledged by scholars (Pucher & Buehler, 2010; Mohan, 2002; Litman, 2007; Saelensminde, 2004) as an inherent benefit of non-motorised transport usage. Communities with better level of cohesion, equity, and liveability have been acknowledged to have a higher level of non-motorised usage (Shumi et al, 2014).

Countries of the world are encouraging the use of non-motorised transport to create a friendly environment and liveable and sustainable urban society. A shift in the travel choice from motorized transport to non-motorised transport mode is one transport control measure to reduce air emission associated with automobile use (Parida & Parida, 2000). To encourage the use of NMT, Litman (2011) identifies improvement in walking and cycling conditions and restriction in automobile use. Department of Transport (2000) also identifies safety and security of pedestrians and cyclist as key to the usage of NMT, and point out improvement in lighting, crossing and signal setting, traffic calming measures, signing and improvement in accident care as the needed ingredient of safety and security programme.

Litman et al, (2011) emphasize accessible physical infrastructure with no restriction to the need of different kind of people, (old or young, vulnerable or not vulnerable) so much that it enhances the convenience of users and promote usage of NMT, otherwise poor or non-existence of non-motorised transport infrastructure will deter people from making NMT a choice to travel with. Other factors that have been identified in the literature are the well-developed road for high-speed traffic with large parking facilities (VTPI, 2008) without consideration for non-motorised traffic. Assessment of city liveability can best be judged by the way residents, visitors and employees perceived the totality of the environmental and social quality (Weissman and Corbett, 1992 & VTPI, 2008) which is a function of the ability to move within using sustainable transport. The usage of non-motorised transport is examined to contribute to this body of knowledge on the factors of city liveability and quality of urban life.

### 3.0 Study area and Methodology

Abeokuta is one of the ancient cities in southwest, Nigeria. It is the capital city of Ogun state, located on the latitude  $7^{\circ}09'20.56''$  N and longitude  $3^{\circ}20'42.32''$  E. The city dwellers are predominantly Yoruba's with other tribes like Hausa, Ibo, and others found in clusters around the town. There are about six city centers or traffic nodes within the town, namely Ibara, Kuto, Lafenwa, Sapon, Adatan, Iberekodo, and Ita-oshin. This study focuses on three of the city centres. These are Ibara CBD, Kuto, and Lafenwa.

Manual classified traffic counts were conducted at the three identified city Centres. The centres were chosen because of the intensity of traffic and concentration of activities within and around the centres. The traffic node was cordon off and the main inlet was manned by three traffic observers, each recording minimum of four vehicle types that pass the cordon point. The traffic count was conducted for three days and average daily traffic obtained and analyse to determine modal spilt and trip rate for each classified road mode.

Primary data were collected on the use and non-usage of non-motorised transport mode with the use of a questionnaire. Respondents were intercepted at a cordon point and samples were picked after completion of the questionnaire with the previous sample. between the period of 7 am and 6 pm of the survey a sample of 196 were selected from Lafenwa; 188 from Kuto and 179 from Ibara, given a total of 563 samples for the study. The structured questionnaire explores different modes of transport used for the main trip and those use for the first and last-mile trip. Data obtained were processed with SPSS version 24, using of descriptive statistics technique.

### 4.0 Result and discussion

The result is presented in three sections, first, the modal share analysis, followed by the uses of non-motorised transport, and the final section discuss the reasons for use and non-usage of non-motorised transport mode.

#### 4.1 Modal share analysis: manual classify counts

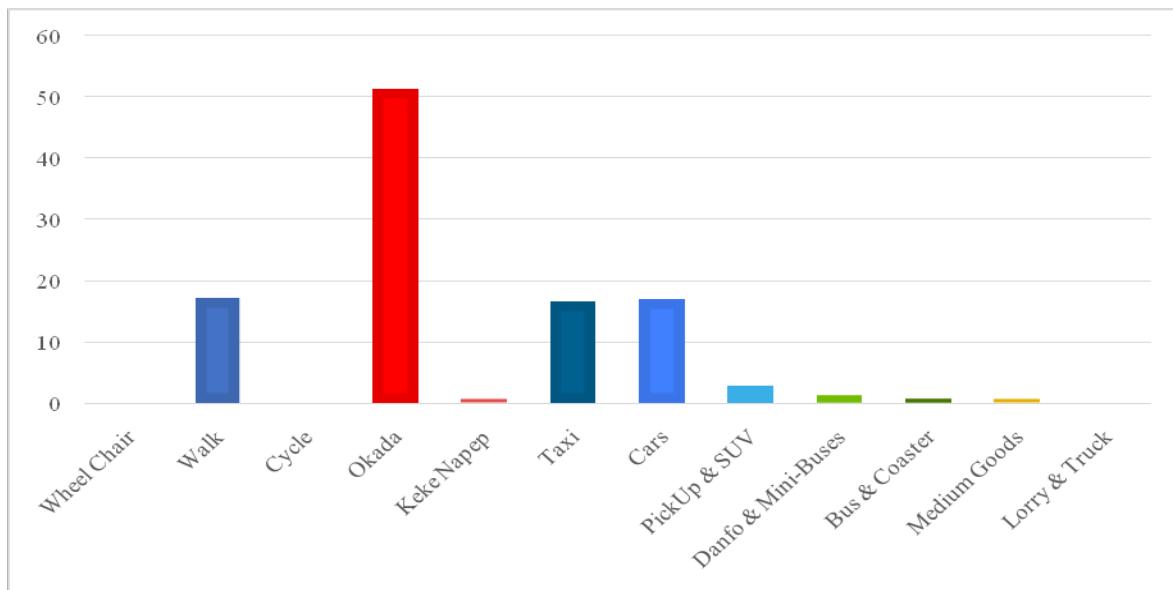
Analysis of road mode used for intracity trips is presented in Table 1, twelve classes of the vehicle were identified, Non-motorized modes comprise wheelchair, bicycle, and walking. A total of 17.1% was recorded for NMT, while motorcycle (Okada) has the highest rate of 51.1% which mean that half of the trips were made by motorcycle. Taxi and Private cars recorded 16.4% and 16.8% respectively while other modes including tricycles, pick-up van, minibusses, coaster buses, medium goods vehicle, lorry and truck accounted for 5.5%. The result presented reflect higher rate for motorcycle (51.1%) and cars (33.2%) for urban trips, which suggest that these modes are readily accessible in terms of availability and cost to the urban commuter. Hence,

intra urban movements are more undertaken by these modes.

TIME PERIOD	WHEEL CHAIR	WALKING	BICYCLE	MOTORCYCLE (OKADA)	TRICYCLE	TAXI	CARS	PICKUP & SUV	DANFO & MINI-BUSES	BUS & COASTER	MEDIUM GOODS	LORRY & TRUCK	TOTAL
Lafenwa	14	2026	2	10600	147	2009	2877	202	86	86	139	30	18218
Kuto	2	2549	1	4030	14	2288	1748	424	214	81	14	2	8815
Ibara	3	1768	5	4393	11	1813	1627	379	128	49	16	12	10204
Total	19	6343	8	19023	172	6110	6252	1005	428	216	169	44	37237
Percentage	0.1	17.0	0.0	51.1	0.5	16.4	16.8	2.7	1.1	0.6	0.5	0.1	100.0

**Table 1 Modal trip rate**

Source: Field survey 2021



**Figure 1: Modal share**

#### 4.2 Uses of non-motorised transport

Table 2 presents commuters' preference modes for intra urban movement. Modal split analysis revealed a cumulative percentage of 23.1% for those who use non-motorised transport modes, comprised of wheelchair (0.7%), bicycle (1.1%), and walking (21.3%). Private car usage recorded 23.3%, taxi has 19.7%, and motorcycle/tricycle accounted for 31.3%, while trucks and other vehicles accounted for less than 1%. This result corroborated the trip rate obtained from the classified manual traffic count presented above, as it reflects that motorcycle, private car, and taxi dominate intra urban trip.

Further analysis of usage of NMT mode by those commuters who use it for the entire journey revealed that walking accounted for 92.3%, while those on wheelchair and bicycle recorded 3%

and 4.7% respectively. This reflects that bicycle is seldom used for intra urban journey, the reason for this could be attributed to the capability of bicycles to interact with the automobile traffic.

**Table 2: Modal split analysis**

Modal split	Frequency	Percentage	Cumulative percentage
Wheel chair	4	0.7	23.1
Walking	120	21.3	
Bicycle	6	1.1	
Car	131	23.3	76.9
Motorcycle/tricycle	176	31.3	
Taxi	111	19.7	
Truck/van	13	2.3	
Others	2	.4	
Total	563	100	100

Further analysis on the level of usage of non-motorized transport is presented in Table 3. The result revealed that commuters use non-motorised mode at a different level of their journey. The data revealed that 37.1% use NMT to connect the public transport at the bus stop from home and 35.5% equally link their destination from the bus stop by NMT while 23.1% use it for the entire journey. Only 4.3% of the commuters claimed non-usage of NMT at all. Therefore, it means that over 90% of the commuters use NMT at one point or the other in their daily journey.

**Table 3: Levels of non-motorised transport usage**

Levels of usage	Frequency	Percentage
Home to bus stop	209	37.1
Entire journey length	130	23.1
Bus stop to destination	200	35.5
Not at all	24	4.3
Total	563	100

#### 4.3 Reason for usage/non-usage of NMT modes

Factors that affect usage and non-usage of NMT modes are presented in Tables 4 and 5. Commuters who use NMT mode for their journey gave different reasons, 28.6% gave the reason of the high cost of public transport, and 9.5% attribute their usage of NMT to health reason. Another 12.5% gave the reason of short distance to destination and 31.4% attribute it to the

need to stop before the final destination, while 17.6% gave the reason of inaccessibility of other transport modes, only 0.5% gave other reasons. From this analysis, usage of NMT mode is because the alternative modes are costly (28.6%), and also because of its inaccessibility (17.6%) to the commuter, therefore, it means that if the alternative mode is accessible economically and physically the use of NMT mode will drop. It is also significant that the intervening opportunity that may be enjoyed for using NMT because of its flexibility made 31.4% of commuters use NMT.

**Table 4: Reason for usage of Non-motorised Transport Mode**

Reasons	Frequency	Percentage
Cost of Public Transport	37	28.6
Health Reasons	12	9.5
Short distance to destination	16	12.5
Need to stop before final destination	41	31.4
Inaccessibility of other mode	23	17.6
Others	1	.5
Total	130	100

Table 5 revealed the reason for non-usage of NMT mode, the analysis revealed that 3.8% do not use NMT mode because it is stressful, 10% gave the reason of lack of infrastructure, 8.5% attributed it to fear of road accident, 0.8 gave the reason of security and 1.5% gave other reasons while 75.4% attributed their non-usage of NMT mode to the availability of alternative mode. By implication the availability of alternative para-transit modes e.g., motorcycle, tricycle, and taxi have a significant influence on the use of NMT mode, this is because these modes of transport also provide flexible door-to-door transport service to urban commuters.

**Table 5: Reason for none usage of Non-motorised Transport Mode**

Reasons	Frequency	Percentage
It is stressful	17	3.8
There is alternative mode	326	75.4
Lack of non-motorised infrastructure	43	10.0
Fear of road accident	37	8.5
Security and safety	3	.8
Others	7	1.5
Total	433	100

## 5.0 Conclusion and Recommendation

This study has shown that para-transit mode dominates the urban traffic and because of its availability in every nook and cranny of the urban settlement, the commuter can easily access them for the various journeys, their flexibility of service makes it a preferred option for the urban trip. This is corroborated by the commuter's preference for motorcycles, private cars, and taxi while walking is reduced only to first and last-mile trips (journey to the bus stop and from the bus stop to destination). Interestingly, over 90% of the commuters use NMT at one point or the other in their daily journey, either for the entire journey or to connect bus stops and destinations. A good number of commuters take a walk because of the intervening opportunities which are created by commercial and social activities that dotted the neighborhood. What this suggests is that planner needs to see mixed land use as an approach to promote non-motorised transport usage. Hence, designing the street to provide an opportunity for pedestrians and cyclists to interact socially and economically is necessary to create a liveable urban settlement.

The study also reflected that bicycle is seldom used for intra urban journey, despite the health, social, environmental, privacy and flexibility of service benefits that accrue to individual and community at large. The reason for this reduction in that the use of bicycles could largely be due to the capability of bicycles to intermingle with the automobile traffic, especially two and three-wheeler motorized vehicles that have dominated the urban traffic system. Of which the riding culture portrays reckless and dangerous maneuvering in a situation of poor road infrastructure that does not equally have bicycle facilities. Planners must begin to view city planning with a focus on non-motorised transit-oriented development with facilities for walking and cycling.

From this analysis, usage of NMT mode is because the alternative mode is costly (28.6%) and also because of its inaccessibility (17.6%) to the commuter, it, therefore, means that if the alternative mode is accessible economically and physically the use of NMT mode will drop. The implication of alternative para-transit mode e.g., motorcycle, tricycle, and taxi are that it has a significant influence on the use of NMT mode, because, these modes of transport also provide flexible door-to-door transport service to urban commuters. Hence, there is a need to regulate or restrict the use of para-transit in the urban transport system and integrate non-motorised transport mode in the public transport system planning, to a greater extent will reduce the fossil fuels used by these modes and promote cleaner air and friendly urban environment with the overall achievement of sustainable green cities.

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## Salient Cost of Road Infrastructure Re-Development on Urban Residents In Port Harcourt, Nigeria

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### ABSTRACT

*The Rivers State government in 2019 embarked on road redevelopment and flyover bridge construction in a bid to improve movement of humans, goods and services with enhanced road connectivity to boast economic growth in Port Harcourt Metropolis. However, road redevelopment within a densely populated city can produce complex negative impacts. This study investigates the salient cost of road redevelopment projects on residents of Port Harcourt metropolis adopting a risk management methodology known as Hazards and Effects Management Process (HEMP) (SHELL,2005). The study reveals that the city is currently a huge construction site with multiple flyovers and road expansion projects going on concurrently, with severe socio-economic impact on residents in the short term. Residents complain of delay in travel time as a result of intense traffic congestion due to road closure and uninformed road diversion; long distant trekking to board public transportation, increase transportation fare, constant noise and vibration from earthmoving trucks; air pollution and chesty coughs. Remarkably, the residents recognize the long-term benefits of the projects upon completion such as; job opportunities, city functionality, and enhanced residents' quality of life, re-awakening the city's attractiveness and its ability to compete globally. While residents have developed resilient adaptation measures, this study recommends that Government should adopt an incremental approach*

*to development and encourage inter-agency collaboration amongst its Ministries, Agencies and Departments to develop integrated strategies and traffic management options that will cushion the negative effects of urban redevelopment projects on residents.*

**KEYWORDS:** Road Infrastructure, Redevelopment, Socio-economic Impacts, HEMP, Resilience.

## 1.0 INTRODUCTION

Cities are prospectively high productivity areas and drivers of economic growth and development but the spatial configuration of economic activities in cities is dependent on infrastructure (Collier & Venables, 2016). Urban infrastructure is important in maintaining and advancing city functionality, economic growth and enhancement of the residents quality of life (Asikhia & Uyoyoghene, 2011). The urban infrastructure, particularly, roads are fundamental structures that aid the operation and development of urban area and its of significant importance for improving the residents environment, city support capability and operation efficiency as well as aiding stable progress of sustainable urbanization (Yang, Wu, & Yu., 2016). Road infrastructure form vital links to urban production centres and markets, employment centres, social, health and educational structures and services. Good quality and sufficient infrastructure are vital elements of prosperity of any nation (Saed, Kamariah, Mohammed, & Johani, 2015). Road infrastructure is the most often used mode of land transport. It is flexibility in service, offer door-to-door communication and has the capacity to connect places more than other modes of transport. Tunde & Adeniyi, (2012) further stated that it covers a wide range, physically convenient, highly flexible and usually the most operationally suitable and readily available means of movement of goods and services over short and long distances. Adedotun & Adedotun, (2014) are of the opinion that road provides the vital links between spatially separated facilities and enables social contact and interaction within man and the environment. The growth and progress of a society is determined and measured to a large extent by the socio-economic development of the city and this to a large extent is dependent on the transportation system of the area.

Port Harcourt metropolis which was previously well planned with Ebenezer Howards garden city concept, built with adequate road transport infrastructure, loved, lived and managed by the then colonial masters have in the face of the constant increase in population, the rapid city expansion and the negligence of government, service providers and residents recorded road transport infrastructure deficit, decay and inadequacy. Poor road condition, inadequate drainage systems, road side parking and irregular parking, intense traffic congestion, poor traffic signals and signs, were significantly evident in Port Harcourt metropolis. These constraints have given rise to technical, jurisdictional, environmental, social, economic and financial implications

which are affecting residents' quality of life, city attractiveness and competitiveness. In the face of these challenges and the desire to enhance transportation connectivity as an engine of economic growth, the Rivers State Government prioritized the redevelopment and construction of major roads and flyovers in Port Harcourt metropolis as part of its policy on roads, drainage and transportation infrastructure and urban renewal policy to reawaken the garden city status of Port Harcourt which has eroded over the years.

The concomitant socio-economic cost cannot be wished away, thus the essence of this study, to investigate and document the salient cost of road redevelopment projects on residents' livelihood. The study will specifically identify the key locations of flyovers construction in the study area, ascertain the current status of the flyover projects, analyze the effects of the redevelopment (multiple flyover construction and road expansion) projects as well as determining the socio-economic impacts of the projects and identify the mitigation/ resilient measures utilized by residents to cushion the adverse impacts.

## 2.0 LITERATURE REVIEW

Misgap, 2014; Adedotun, Ogundahunsi & Oyeniyi, (2016) are of the opinion that transportation promotes development in any area and when transportation is hindered, development is also retarded. Since the major means of transport in the urban area is road transport, and that there cannot be any road transport without roads, it thus translates that there will be no enhancement of quality of life of citizens, economic development and productivity without good road infrastructure (Taube, 2013). In the words of Misgap, (2014), in the absence of urban infrastructure like adequate roads, development will be a near impossibility. The condition of urban roads therefore has major roles to play. Associated to the urban road condition are road usage challenges like road traffic accident and traffic congestion. Road traffic accident (RTA) is a current global development epidemic. The World Health Organization (WHO) 'estimates that road traffic crashes cause over 1.2 million deaths and about 50 million people are injured per year' (WHO, 2009). And one of the causative factors of road traffic accident is bad roads. Studies on the importance of roads in an urban area agrees to the fact that road is a type of critical infrastructure whose development has direct bearing on the overall growth of every nation (Spacey, 2017). Oni & Okanlawon (2006) present road infrastructure as the major structure of the transport system offering the provision of transport service and operation and thus, a major tool for both economic and strategic development. Anofojie, Adeleye & Kadiri (2014) spelt out types of infrastructures of which road transport infrastructure is prime. They argue that the provision of adequate infrastructure like good road is a basic requirement that determine the socio-economic wellbeing of the area. Undoubtedly, infrastructure investments on road construction occupy a substantial amount of public funds.

Most countries around the world today are experiencing an on-going rapid migration of people

from rural areas to urban areas (kudos to available road transport infrastructure) where the interactions between land policy and infrastructure facilitate economic opportunities (Ingram & Brandt, 2013). More than half of the global population of 7.8 billion currently lives in urban areas with Asia (59.5%) and Africa (17.2%) on top of the list (United Nations (UN) 2019). It is projected that urbanization will continue in the coming years, raising the urban population to surpass 10.0 billion by 2057 (UN, 2019). The dynamics is that two out of every three people born during the next 30 years are likely going to live in urban areas. The implication of this rapidly increasing urban population is no doubt going to place more demand on road transport. But what makes road transport count? It is the infrastructure. The efficiency and effectiveness of any transport system depend on its infrastructure and services (Ocholi, Okeme & Ahmed, 2020).

Urban road development, rehabilitation and redevelopment are urban renewal strategies of improving accessibility and reliving urbanization induced road traffic congestion. The Rivers State government has embarked on road rehabilitation, redevelopment, including expanding existing flyover ridges and constructing new ones in Port Harcourt metropolis. According to Afolabi, Oyetubo, & Oluwaji, (2018) road construction, redevelopment and maintenance impact on socio-economic conditions of the area by creating more difficult trading ambience. Activities such as noise or dusty/odorous equipment or materials stockpiles discourage trading in the immediate vicinity of these construction sites leading to low customer patronage. As a result, some traders lock up shops temporarily or may relocate permanently when the situation becomes unbearable, considering the short gestation period for such projects. The concomitant effects can significantly increase the informal sector vulnerability to poverty.

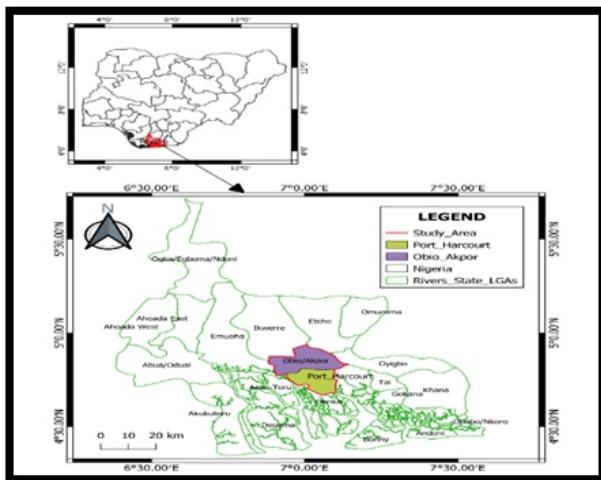
### 3.0 DESCRIPTION OF THE STUDY AREA

Port Harcourt metropolis, capital city of Rivers State, Nigeria is a body of land surrounded to a high degree of water and is located between longitudes 6°55' and 7°10' East of the Greenwich meridian and latitudes 4°40' and 4°55' north of the equator. The city is positioned at the entrance of Bonny River; a distance of about 25km from the Atlantic Ocean. Port Harcourt metropolis spans over two local government areas (LGAs) viz Port Harcourt and Obio/Akpor and are bounded by Ikwerre and Etche Local Government Areas at the North, Degema and Okrika Local Government Areas at the South, Emuoha LGA at the West and Eleme and Oyigbo LGAs to the East. Port Harcourt, originally known as "Igwu-Ocha" by the indigenous Ikwerre and fondly called Pitakwa, was founded in 1913 by the British in an area traditionally inhabited by the Ikwerre and the Okrika Ijaw (Onwuejeogwu, 1981). It was named after Viscount Harcourt, then British Secretary of State for the Colonies. The initial purpose of the port was to export the coal, which geologist Albert Ernest Kitson had discovered in Enugu in 1912 (Ogionwo, 1979). Figure 1.1 and 1.2 are maps showing Nigeria, Rivers State and Port Harcourt Metropolis. The 1991 National Population Census results showed that Port Harcourt metropolis comprising Port Harcourt City and Obio/Akpor LGAs had a population of 703,416 persons (Akpodomeh,

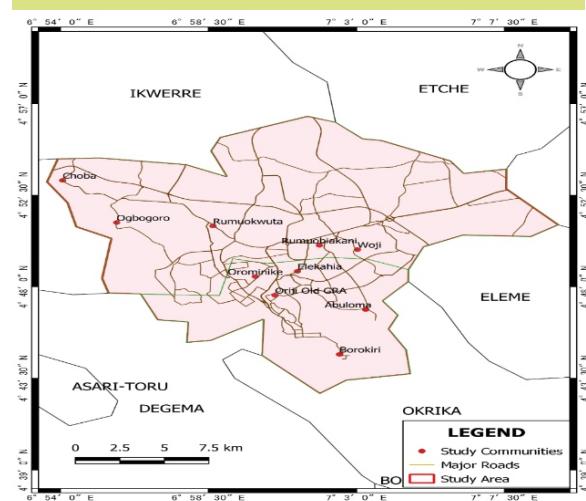
2001). In 2006, the combined population of the LGAs that makes up Port Harcourt Metropolis stood at 1,000,908 persons (National Population Commission, 2006).

The city is a major educational, administrative, commercial and industrial center. Since it hosts most of the nation's multi-national oil and gas exploration and production companies, two refineries, petroleum-related service companies, it is regarded as the oil capital city of Nigeria (Wokekoro and Owei, 2014). This situation therefore is attracting migrants from all direction into Port Harcourt and the result is alarming tilting to serious pressure on available basic urban infrastructures and services. Port Harcourt Metropolis is a blend of two local government areas—the Port Harcourt City local government area and the Obio/ Akpor local government area of Rivers State.

**Fig. 1.1 Map of Nigeria showing Rivers State and Port Harcourt Metropolis**  
Source: RSU URP- GIS Lab, 2021



**Fig 1.2: Map of Port Harcourt Metropolis showing Major Roads**  
Source: RSU URP- GIS Lab, 2021



#### 4.0 RESEARCH METHODOLOGY

The target population for the study includes road users/ residents, market women and commercial drivers of the study area. The Creative Research Survey System Software, Version 12 was used to calculate the sample size for the study. Under a 95% confidence level and 5% confidence interval, the sample size of 384 was obtained and questionnaires were distributed to road users/ residents of the study area. Half of the total questionnaire was administered in Port Harcourt City LGA while the remaining half were administered in Obio/Akpor LGA based on percentage of population data of selected communities.

Adopting the pragmatist philosophical approach known as pragmatism (Tashakkori & Teddlie, 1998; Creswell & Clark, 2011), a risk management methodology—Hazards and Effects Management Process (HEMP) that is widely used by the multinational was used to uncover the

salient cost which are the socio-economic effects of the multiple fly-over construction in the study area. HEMP methodology is considered suitable for this study based on its effectiveness to identify a variety of hazards at facility and assess the management of the identified hazards. As noted by Salter, (2005) HEMP was developed to identify, assess and manage the Health Safety Environment Hazards associated with manufacturing and production facilities. Salter, (2005) further explained that the HEMP process is an analytical technique that reviews the identified hazards and employs a risk assessment matrix to rank the risk based on consequences and likelihood, while the hazards and identified risks are ranked as major, moderate or minor using the risk assessment matrix technique.

With the Hazards and Effects Management Process (HEMP) (SHELL, 2005), the following steps were followed;

Identifying “hazards and sensitivities”. A hazard (source of effect) has been defined as “an aspect of the activities or facilities of a project during all of its phases that has the potential to cause harm to the environment”, while a sensitivity is a “a specific characteristic of the (social) environment, which once disturbed, leads to the disturbance of the stability or integrity of the environment” (SHELL, 2005). To identify impacts, an interaction matrix of hazards (on the y axis) and sensitivities (on the x axis) was utilized (See Table.1). Each number shown in Table. 1 yielded one or more impacts (positive and negative) resulting from the interaction of the hazard and associated sensitivity at that point.

Qualifying impacts. This was done with reference to the following attributes: (a) positive or negative; (b) direct or indirect; (c) short term/ temporary or long term/ permanent; (d) reversible or irreversible; (e) phase of occurrence (mobilization, construction, operations, or decommissioning and abandonment); (f) local and / or regional, and / or national, and / or global); and (g) incremental or non-incremental.

Ratings of impacts—carried out with reference to the probability/ likelihood of their occurrences and their consequences. Estimation of probability (likelihood) of occurrence is a qualitative issue—high probability (80–100%) refers to a very likely or very frequent impact (e.g., continuous/ hourly); medium high probability (60–79%) refers to a likely or frequent impact (e.g, daily/ weekly); medium probability (40–59%) refers to a possible or occasion impact (e.g., monthly); medium low probability (20–39%) refers to an unlikely impact ( e.g, one that occurs in every 1–10 years); and low probability ( 1–19%) refers to a very unlikely or rare impact ( e.g, one that will take over 10 years to occur). The potential consequence of an impact depends on two things: the magnitude of the potential change to the (social) environment caused by a hazard; and the level of sensitivity of the receiving environment between the magnitude of change and receptor sensitivity will yield a level of effect as shown in Table.1. Levels of effect translate to potential consequences as shown in Table. 2.

**Table. 1: Interaction Matrix of Receptor Sensitivity and Magnitude of Change, Showing Resultant Effects**

Receptor Sensitivity	Level of Change		
	Low	Medium	High
Low	Trivial Effect	Slight Effect	Substantial Effect
Medium	Slight Effect	Substantial Effect	Big Effect
High	Significant Effect	Immense Effect	Massive Effect

Source: Shell, 2005.

**Table. 2: Levels of Effect and Potential Consequences**

Levels of Effect	Potential Consequences
Massive	Extreme
Big	Great
Substantial	Considerable
Slight	Little
Trivial	Hardly Any

Source: Shell, 2005.

The potential consequences of social impacts can be described in the following manner;

**Hardly Any**—A trivial effect on the social environment is one which causes almost no nuisance or damage in the community. The local culture and lifestyle as well as the social infrastructure are somewhat negatively affected, but the effect is only temporary. The impact may perhaps result in some divergence opinion with stakeholder groups, but relationships will probably remain strong.

**Little**—Slight effect/impact on the social environment, which causes momentary changes in the way of life of the inhabitants of the community. The local traditions and societal structure are negatively affected. There appears to be disagreement with stakeholder groups, but relationship remains fairly strong.

**Great**—A big effect on the social environment. There is stable disruption to communal lifestyle. The local traditions and the societal structure suffer greatly. There exists a fundamental disagreement between the communities and its stakeholders that destabilizes the relationships. This may

affect the speed and effectiveness of future decision-making processes.

**Extreme**—A huge effect on the social environment. There is sustained large interference of, and changes to, the lifestyle of a community, leading to a reduction in quality of life of people in the area. Impacts have turned out to be a concern for all stakeholder groups. There is irreparable damage to social structure, traditional culture and social amenities, as well as total breakdown of stakeholder relationships.

The rating or risk assessment of potential impacts may be done numerically or qualitatively. Table 3 shows a qualitative impact assessment matrix.

**Table 3 : Qualitative Impact Assessment Matrix**

		Potential Consequences				
Likelihood	Positive	Negative				
		Hardly any	Little	Considerable	Great	Extreme
High		Moderate	Moderate	Major	Major	Major
Medium		Minor	Moderate	Moderate	Major	Major
High		Minor	Minor	Moderate	Moderate	Major
Medium		Negligible	Minor	Minor	Moderate	Moderate
Low		Negligible	Negligible	Minor	Minor	Moderate
Low		Negligible	Negligible	Minor	Minor	Moderate

Source: Shell, 2005.

This matrix is employed with likelihood plotted on the y axis and Consequences on the x axis. The cells of the matrix, representing possible combinations of likelihood and consequence, give the levels of impact significance as judged by experts. For instance, an impact adjudged to have a low likelihood of occurrence but of great potential consequence will have a minor significance rating.

## 5.0 ANALYSIS AND DISCUSSION

### 5.1 Locations and Current Status of Flyovers Construction in the Study Area

**Table 4: Flyovers locations and status**

Flyover Location	Status
Rebisi (Garrison) / Aba road	Completed
Okoro Nu–Odo (Rumuokoro)/ Ikwerre road	Completed
Rumuogba (Artillery)/ Aba road arterial	Completed
Rumuola Expansion / Aba road arterial	Ongoing
GRA (Ezimgbu) / Aba road arterial	Ongoing
Oroabali (CFC) Expansion / Aba road arterial	Ongoing
Rumukalagbo (Waterlines) / Aba road arterial	Ongoing
Nkpolu–Oroworukwo (Ikoku)/ Ikwerre road	Ongoing
Rumuepirikom (Iwofe)/ Ada–George road	Ongoing
Rumukwurusi / East–West road	Yet to commence

Source: Researchers' Fieldwork, 2021

Table 4, shows the ten (10) flyovers project awarded by the Rivers State Government to construction giant Julius Berger. Three (3) of the flyovers (Rebisi, Okoro–Nu–Odo and Rumuogba) have been completed and in use as shown in plates 1and 2, six(6) flyovers are ongoing as shown in plates 3–7 and one (1) flyover project (Rumukwurusi) is yet to commence fully. Carrying out construction work simultaneously on the major arterial and distributor in the city will have serious implication on road traffic and socio-economic wellbeing of residents.



Plate 1: Rebisi Flyover Completed



Plate 2: Rumuogba/ Artillery Flyover Completed



Plate 3: Rumuola Flyover Expansion On-going



Plate 4: GRA/ Aba Road Flyover On-going



Plate 5: Waterlines/ Aba Road Flyover On-going



Plate 6: CFC/ Aba Road Flyover On-going with Commissioner for Works on Inspection



Plate 7: Ikokwu/ Ikwerre Road Flyover Construction On-going

## 5.2 Subjective Assessment of the Effects of the Redevelopment (Multiple Flyover Construction and Road Expansion) on Social Sensitivities

Subjective assessment of the socio-economic impacts was carried out by (a) questioning household respondents, and (b) interviews drawn from two occupational groups (market women and commercial drivers) in order to gauge the distributional impacts of the construction of multiple flyovers in Port Harcourt metropolis at the same time.

The head of households were asked to rate the effects of the construction of multiple flyovers in Port Harcourt metropolis at the same time (with respect to several dimensions of the socio-economic environment, namely: intense traffic congestions, cost of living, noise, pollution and accidents.

**Table 5: Interaction of Hazards (Sources of Effects) and Social sensitivities of Multiple Flyover Construction and Road Expansion**

Hazard	Sensitivity	Intense Traffic Congestion	Cost of Living	Noise	Pollution	Accidents	Levels of income/financial flows	Cost of living/inflation rate	Access to housing	Access to transport	Access to roads/waterways	Opportunity for contracting and procurement	Safety and security of living environment	Balance in gender	Balance in age	Ethnic balance	Functioning of family structure and traditional institutions	Cultural values and languages	Morals and family values	Religious/traditional structures and customs	Access to educational facilities	Access to recreation facilities	Religious balance	Access to sanitation and waste management	Blame in local employment
Intense Traffic Congestion	1	2	3	4	5	6	1	2	3	4	5	6	7	7	7	7	7	7	7	7	7	7	7	7	
Cost of Living							2	2	3	3	4														
Noise							1	2	3	3	4														
Pollution							2	2	3	3	4														
Accidents							2	2	3	3	4														
Levles of income/financial flows																									
Cost of living/inflation rate																									
Access to housing																									
Access to transport																									
Access to roads/waterways																									
Opportunity for contracting and procurement																									
Safety and security of living environment																									
Balance in gender																									
Balance in age																									
Ethnic balance																									
Functioning of family structure and traditional institutions																									
Cultural values and languages																									
Morals and family values																									
Religious/traditional structures and customs																									
Access to educational facilities																									
Access to recreation facilities																									
Religious balance																									
Access to sanitation and waste management																									
Blame in local employment																									

### 5.3 Effects of the Multiple Flyover Constructions and Road Expansion on the Socio-economic Environment Dimensions

**Table 6: Respondents 'Rating of the Effects of the Multiple Flyover Constructions and Road Expansion on the Socio-economic Environment Dimensions**

S/No	Environmental Dimensions	Socio-economic		3 Don't Know/ Uncertain	4 Slight	5 Very Slight
		1 Very Severe	2 Severe			
1	Traffic Congestions	79.0	15.2	0	5.7	0
2	Cost of Living	74.3	0	5.7	15.2	4.8
3	Noise	60	34.3	5.7	0	0
4	Pollution	53.3	24.8	11.4	10.5	0
5	Accidents	5.7	15.2	5.7	49.5	23.8

Source: Researchers' Fieldwork, 2021

### 5.4 Objective assessment of the effects of the redevelopment (multiple flyover construction and road expansion) on social sensitivities

The steps in the Hazards and Effects Management Process (HEMP)—which was used in the objective impact assessment—, have been stated under Methodology. The impacts described below are those that were qualified as Negative and rated as being High significance (see Table. 6). Excluded here are the impacts qualified as Negative but rated as being of low significance.

**Table 7: Impacts Qualification and Rating**

Code number	Impact Description	Qualification	Likelihood	Consequence	Rating
1	Reduction in Level of Income/ financial flows	<ul style="list-style-type: none"> <li>-Negative</li> <li>-Direct</li> <li>-Short-term</li> <li>-Reversible</li> <li>-Local</li> <li>-Non-incremental</li> </ul>	High	Great	High
2	High Cost of Living /Inflation	<ul style="list-style-type: none"> <li>-Negative</li> <li>-Direct</li> <li>-Short-term</li> <li>-Reversible</li> <li>-Local</li> <li>-Non-incremental</li> </ul>	High	Great	High
3	Access to Recreation	<ul style="list-style-type: none"> <li>-Negative</li> <li>-Direct</li> <li>-Short-term</li> <li>-Reversible</li> <li>-Local</li> <li>-Non-incremental</li> </ul>	High	Considerable	Minor
4	Poverty	<ul style="list-style-type: none"> <li>-Negative</li> <li>-Direct</li> <li>-Short-term</li> <li>-Reversible</li> <li>-Local</li> <li>-Non-incremental</li> </ul>	High	Great	High
5	Reduction in Safety and security of living environment	<ul style="list-style-type: none"> <li>-Negative</li> <li>-Direct</li> <li>-Short-term</li> <li>-Reversible</li> <li>-Local</li> <li>-Non-incremental</li> </ul>		Great	High

6	Religious balance	-Negative -Direct -Short-term -Reversible -Local -Non-incremental	Medium  Low	Considerable	Moderate
7	Access to transport	-Negative -Direct -Short-term -Reversible -Local -Non-incremental	Medium  Low	Considerable	Moderate
8	Access to educational facilities	-Negative -Direct -Short-term -Reversible -Local -Non-incremental	Medium  Low	Considerable	Moderate

As shown by table 7, there were eight (8) negative impacts of either high or moderate significance and there were also positive impacts, as listed below;

Free flow of traffic at the completion of the on-going constructions; Increase in the value of properties in the affected areas; Some levels of short-term employments to locals; Women sometimes gain short business as food vendors, during the period of construction activities;

It also improves the aesthetics of the city.

Table 8 shows impact mitigation/ enhancement and management measures for the afore-stated negative and positive impacts. Following standard practice, mitigation measures are applied only to impacts adjudged to have a gross (initial) high or moderate significance, such that net ratings drop to low significance after mitigation. Impacts initially adjudged to be positive of course remain positive after enhancement measures have been applied.

**Table. 8: Social Impacts Mitigation and Enhancement Framework**

S/n	Impact Description	Gross Impact Rating	Mitigation/ Enhancement Measures	Net Impact Rating	Responsi- bility (Ac- tion Party)	Timing of Action
<b>Mitigation Measures</b>						
1	Reduction in level of income and financial flow	Major	Improvement in the available sources of livelihood through provision of both skilled and unskilled jobs (employment) for locals	Minor	Concerned Company & Govt	Within 1 month of assessment report
2	Reduction in living cost / inflation rate	Major	Creation of jobs by way of employment & improvement in the sources of income	Minor	Concerned Company & Govt	Within 1 month of assessment report
3	Access to Recreation	Moderate	Provision of more recreational facilities to complement existing ones	Minor	Concerned Company & Govt	Within 1 month of assessment report
4	Increase in level of poverty	Major	Reduction in poverty level through the provision of employment opportunities and empowerment schemes	Minor	Concerned Company & Govt	Within 1 month of assessment report
5	Reduction in Safety and security of living environment	Major	Provision of additional security personnel to preserve and protect the living environment of the area	Minor	Concerned Company & Govt	Within 1 month of assessment report
6	Religious balance	Moderate	Respect for religion, tradition & custom of the area	Minor	Concerned Company & Govt	Within 1 month of assessment report

7	Access to transport	Moderate	Provision of alternative transportation routes within the area devoid of the hazards associated with the construction	Minor	Concerned Company & Govt	Within 1 month of assessment report
8	Access to educational facilities	Moderate	Readjustment of school hours in the metropolis, to ease congestion	Minor	Government	Within 1 month of assessment report
<b>Enhancement Measures</b>						
9	Rise in level of income and financial flows	Positive	Create an enabling environment for easy movement in order to help the informal sector of the economy that is greatly affected by this action of development	Positive	Government	Duration of the construction activity
10	Rise in the cost of living/inflation rate	Positive	Creation of jobs and improvement in the sources of income	Positive	Concerned Company & Govt	Duration of the construction activity
11	Access to transportation	Positive	Create noticeable access points, lanes and regulators for easy movement of commuters and vehicles	Positive	Concerned Company & Govt	Duration of the construction activity
12	Reduction of poverty	Positive	Empower/encourage Locals/residents to undertake all levels of procurement, all low-skilled and unskilled jobs should go to locals and some agreed quota of skilled-jobs.	Positive	Concerned Company & Govt	Duration of the construction activity

(Source: Researchers' Recommendation, March 2021)

## 6.5 RESILIENT MEASURES

- People are leaving their homes earlier and returning home earlier due to challenge of access to transport and unpredictable traffic situation.
- Car owners often abandon their car in patronage of public transport.
- Commuters have resolved on their own to trek long distances in order to beat congested traffic in construction areas.
- Neighbourhood markets were created as a result of inaccessibility to two of the three major markets in Port Harcourt metropolis.
- People have resolved to use nose mask for COVID-19 prevention to evade inhalation of massive air pollutants particularly dust particles.

## MAJOR FINDINGS

There is an obvious congruence between the subjective ratings by the residents themselves of the effects of the construction of these flyovers and road expansion projects on their socio-economic life (environment) and the objective assessments by the researchers. We reaffirm that most of the residents considered as “very severe” the effects of the construction and expansion of multiple roads and flyovers infrastructure on their livelihoods such as loss of man-hour on their socio-economic activities as well as increase in travel time, increase in cost of commuter transportation fare and dwindling income. Similarly, the informal sector occupation sub-groups, specifically, market women and commercial drivers reaffirm the deleterious effects of the multiple constructions in Port Harcourt metropolis. Objective assessment has confirmed the serious negative effects of the multiple flyover constructions and expansion on the socio-economic life of residents of the metropolis and to the key environmental sensitivities (traditional livelihood of the people). Nevertheless, for the sake of the positive impacts or benefits of these on-going multiple flyovers and road infrastructure projects at completion, which includes; free flow of traffic, enhanced connectivity, boost in economic activities and the aesthetic value on the image and status of Port Harcourt as the garden city of Nigeria, Port Harcourt residents have developed their resilience capacities and adaptation measures in overcoming the identified short term challenges. This is evidence in the conscious effort of the people to move away from the ‘negative’ tone of victim vulnerability toward the more ‘positive’ thinking of benefit that comes with cost.

## 8.0 CONCLUSION

This study evaluated the salient cost (negative effects) of concurrent multiple flyovers and roads expansion construction in Port Harcourt metropolis using a classical methodology–Hazards

and Effects Management Process (HEMP)(SHELL,2005). Whereas, this study confirms that the city is currently a huge construction site with very severe socio-economic impact on residents in the short term, it also observes that there are massive benefits emanating from the projects on the short term such as job opportunities and host community welfare packages and on the long term when the projects are completed, thus, residents have adapted to the shocks by building resilience capacities. It goes without saying that Port Harcourt as a fast-growing metropolitan city, the third most economic important city and the oil and gas nerve center of Nigeria needs such infrastructural developments to advance the city functionality, boast economic growth, enhance the residents quality of life,re-awaken the city's attractiveness and its ability to compete globally(Asikhia & Uyoyoghene, 2011) which are the derivable long term benefits of the projects.This type of massive urban infrastructural development is prone to have negative effects on residents' livelihoods leading to loss of man-hour, increase in travel time, increase in cost of commuter transportation fare and dwindling informal sector income dependants.This study recommends that Government should adopt an incremental approach to development; encourage inter-agency collaboration amongst the Ministries of Works, Physical Planning and Urban Development, Transportation and Security agencies to develop integrated strategies and traffic management options that will cushion the negative effects of urban redevelopment projects on residents.

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# Pedestrian Safety and the Functioning of Cities in Africa—A Critique of the Design of Pedestrian Footbridges in Kumasi, Ghana

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### Abstract

*In many African cities, pedestrian footbridges appear to have more functions than they are designed to perform. The response of city authorities to these social and economic functions of footbridges has been hostile. To enter the emerging debate on the (unapproved) uses of pedestrian footbridges, this paper explores the dynamic production, co-production and re-production of social and economic spaces around pedestrian footbridges. Using two case studies in Kumasi, Ghana, the study adopted multiple qualitative data collection methods, including pedestrian counts and interviews, institutional consultations, interview of traders around the footbridges and focus group discussions of local stakeholders. The study reveals multiple unintended uses of the footbridges and reactions of pedestrians. Instead of providing safety for pedestrians, footbridges rather produced a huge market space, passenger “pick-up” and “drop-off” points, street vending activities, which reshape their uses and relevance. Thus, the study unpacks how the social contexts and uses of footbridges can be understood and appreciated by city governments. A case is made for footbridges to be re-designed to respond to the socio-economic needs of pedestrians and other users.*

**Key Words:** Pedestrian footbridges, socio-economic spaces, urban safety, Kumasi, Ghana

## 1. Introduction

In many African cities, pedestrian activities constitute over 40% of daily urban trips. For example, in sub-Saharan Africa, Amoako et al. (2014, p. 235) estimated that pedestrian walking accounts for 81% of all trips in Dakar (Senegal), 70% in Addis Ababa (Ethiopia), 60% in Bamako (Mali) and Niamey (Niger), 47% in Nairobi (Kenya), and 42% in Ouagadougou (Burkina Faso). This makes pedestrian movements and trekking important features of urban mobility in African cities. In spite of the heavy pedestrian activities in urban Africa, infrastructure for their safety are usually not available; or where present, inadequate and in poor conditions. The attitude of city governments towards pedestrians is that of neglect. In most cases, facilities for pedestrian safety are introduced as “add-on” to the network and not planned, as part of transport infrastructure provision. When these pedestrian facilities are provided; they are usually aimed at *restricting, redirecting or preventing* movements at various parts of the city. Sometimes, due to their unclear role in providing safety; poor design quality and risks associated with their usage, many pedestrians refuse to use these facilities. Where they are used, many pedestrians infrastructure are put to other uses, than what was intended.

The refusal of pedestrians to use safety infrastructure, usually provided as add-on and not suited for their mobility needs, produces many outcomes. In some cases pedestrian expose themselves to being knocked down by vehicles or motorbikes (Zavitsas et al. 2010); which raises safety concerns in many cities. In other instances pedestrian–vehicular conflicts have been observed when pedestrians refuse to use infrastructure provided for their safety on and along (Amoako et al., 2014). The seeming spatial conflict and chaos that is produced creates a street economy that fits into the urban informality and movement patterns in the cities of the Global South (Lindell, 2018). While focusing on the refusal of pedestrians to utilize road safety infrastructure, the functioning of street economic and social activities generated thereof are poorly understood by most professionals in the built environment and city authorities. The need for a careful and critical assessment of the phenomenon is therefore inevitable. This study uses urban Ghana as a primary case to explore the *use, abuse and non-use* of pedestrian infrastructure; socio-economic activities that emerge around them and how they can be managed to create inclusive and functional urban economies.

In urban Ghana, an important pedestrian infrastructure that has received attention in the last decade is footbridge. Pedestrian footbridges are emerging in Ghanaian cities; with the few available found in the two major cities of Accra and Kumasi. Although they are not many in the country, a number of issues have been raised about pedestrian footbridges in the media; urban planning and development policy communities. The cities authorities in the two metropolitan

areas of Kumasi and Accra have used forced evictions and other brutal approaches to get pedestrians to use the few footbridges available. In some cases, *burglar proofs fences* have been introduced to cordon off unapproved parts of the roads to prevent pedestrian from using them. All these approaches have not been successful—pedestrians continue to scale over the well-built median walls, instead of using footbridges; street economic activities are increasing at *pick up* and *drop off* areas; while paratransit vehicles continue to stop at unapproved areas.

It appears that beyond providing safety for pedestrians, footbridges produce other spaces which shape the morphology and functioning of cities. The *production*, *co-production* and *re-production* of spaces around footbridges generate land use and mobility dynamics which are not clearly understood by various stakeholders in the built environment. Hence, the brutal approaches adopted and used by state and city authorities. To respond to this complexities surrounding pedestrian footbridges, this paper aims at answering three key questions. These are

- Do footbridges ensure pedestrian safety in urban Ghana?
- How can we understand and conceptualise how pedestrian footbridges are actually used?
- What are the complex social and economic realities around the use of pedestrian footbridges in urban Ghana?

The answers to these questions are expected to provide some initial insights into the emerging debate as well as provoke further conversations among urban planners and other professionals and stakeholders in the built environment.

To answer the questions, the study adopted the study of two pedestrian footbridges in Kumasi, the second largest city in Ghana. As the fastest growing city in Ghana (at a rate of 4.2%); Kumasi serves as one of the important commercial centers, not only in Ghana but across West Africa because of its geographical location and road network (Amoako and Korboe, 2011). As a result the city receives so many pedestrians to its central business district (CBD) on daily basis (Amoako et al., 2014). Thus, Kumasi's CBD and the city in general has been an intense commercial hub with substantial pedestrian and vehicular activities generated daily. It is estimated that between 100,000 and 150,000 pedestrians come into the city on a daily basis (Amoako et al. 2014). This make the city suited for the study from both a socio-economic and locational viewpoints.

To ensure logic and clarity of presentation, the paper is structured into six sections. The introduction which presents the study's background and sets its context is the first section. Section two presents and discusses a brief conceptual framework guiding the study. Thus, the section looks at the general perspectives on pedestrian activities in African cities; and shares a few conceptual thoughts on the informal uses of pedestrian-safety infrastructure. The study's approach and methods are captured under section three; while the key findings; recommendations and conclusion are presented in sections four, five and six, respectively.

## 2. Pedestrianized Spaces, Safety Infrastructure and Street Economy—The Three Conceptual Arguments

The study is premised on three main conceptual arguments. Firstly, the study is based on the view that pedestrian activities dominate in African cities constituting between 50% and 78% of all daily trips (Poku-Boansi et al. 2019). The dominance of pedestrians and their activities create many spaces in African cities where social, economic and even socio-political interactions take place. These places in urban Africa are informally used and produce inter-connectedness that are central to the growth of cities on the continent. As a key feature of African cities, the plan for pedestrianized spaces and safety infrastructure should have been central to the planning of urban transport and mobility needs. Sadly, this has not been the case of most cities on the continent; but rather a land use and transport planning that gives priority to vehicular traffic, motorized transport, to the exclusion of pedestrian activities, motorbikes and other IMTs (WHO, 2013).

The second conceptual view, emanating from the first, is that infrastructure for pedestrian safety are provided, usually *as a reaction* or ad hoc solution to mobility challenges; and not as part of the overall plan to ensure the comfort of pedestrians. The idea behind has usually been to resolve urban mobility conflicts and reshape accessibility, mobility and safety of pedestrians (Lasmini & Indriastuti, 2010) but not to get them involved in the cities activities. As a result, most of these infrastructure appear to exclude or separate pedestrians from engaging with the urban fabric. This makes the city centre unfriendly for many visitors. So many urban residents in African cities have observed pedestrian infrastructure being *added on* to the network and re-shaping existing mobility patterns (Amoako et al., 2014), usually with little participation and dialogue. In doing that, consideration for disability and a wide range of urban needs are even ignored (Amoako et al., 2014). As *added on infrastructure*, the perceived and actual needs of pedestrians based on their physical, social and economic conditions may not be taken care of. These needs are neither known to nor perceived by the designer, implementer or city authorities which are to manage and maintain these pedestrian infrastructure.

The third conceptual argument is that since pedestrian infrastructure are added on, they only reshape existing street economic activities instead of solving the initial mobility and safety concerns they are meant for. Thus, the *use, abuse and non-use* of pedestrian infrastructure rather create street economies which are usually not intended by the designers but produced by the users—who usually intend to transform their use to suit their needs.

The three conceptual arguments above can be understood by the concept of *production of space*. The conception was first discussed by a French Sociologist, Henri Lefebvre in the 1960s (1967) to put together his “critical writings” on physical, social and economic formations of the urban. In the conception, he argues that Spaces are not fixed, but can be seen as dialectically moving

between the *planned idea* and the *lived reality*, between *form and content*, between *thought* and *practice*. Based on this idea, space can be understood as: physical, social, economic and material reaction to the areas around footbridges and how they translate to “usefulness” and “use” to the “user”. And in this study, the spaces created around footbridge can be perceived as forms of participation and communication of urban residents to City Authorities, Engineers and Planners about how they want them to be used. While their usage may create nuisance for the functioning of the city, it calls for a re-think of pedestrian infrastructure design, management and usage.

### 3. Approach and Methods

The study is based on two pedestrian footbridges in Kumasi, Ghana. The two study cases were selected based on their locations—one in the central business district (CBD) of Kumasi; while the other is at the entrance of the Kwame Nkrumah University of Science and Technology, about 7km from the CBD. The justification was to explore the nature of pedestrian activities; the range of functions and levels of usage of the footbridges. Thus while the footbridge at the CBD is heavily used; the one at university’s entrance is moderately used. In the selection of the two study locations, the study aimed at assessing whether the social and economic behaviors of pedestrians around footbridges will be significantly different.

For data collection, multiple qualitative methods were adopted and used. These include pedestrian counts and interviews; interview of officials of relevant metropolitan institutions; traders and other users around the footbridges; vehicle operators; and focus group discussions with relevant stakeholders. An average of between 3,000 (for the footbridge at the University’s junction) and 15,000 (for the footbridge at the CBD) pedestrians were counted daily between 6am and 6pm, for a week. At the city level, 8 officials of the metropolitan assembly, road and transport departments were interviewed; 5 officials of the Motor Traffic and Transport Department of the Ghana Police Service were also engaged; while 2 officials of road safety commission were interviewed at the regional office. A total of 250 street vendors, traders, vehicle operators and pedestrians were selected on convenience and interviewed at the two footbridges (100 and 150 for the outside and CBD respectively). All interviews were through interview guides. A total of six focus group discussions were conducted—three at each of the study’s locations—with participants ranging from 12–25. These were made up the executives of the association of traders around the footbridges. In addition to these, direct observations were conducted on weekdays and weekends.

### 4. Presentation of Study Cases and Key Findings

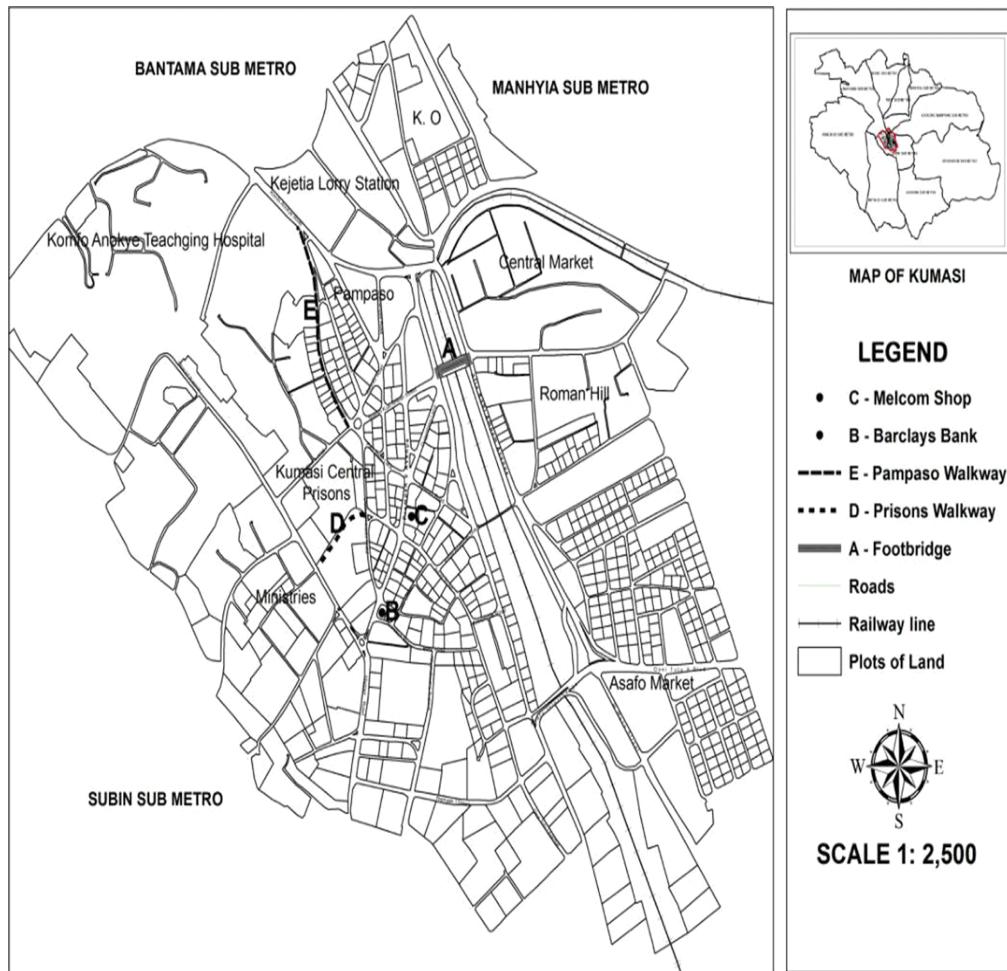
In line with the study’s design, the findings from the field data have been analysed and presented under the two cases. The first case presents the observations made about the uses and socio-economic activities around the footbridge at Kumasi central; when the second case discusses

the observations made on the footbridge at the entrance of the Kwame Nkrumah University of Science and Technology.

#### **4.1 Case StudyOne—Functions and Uses of Footbridge at Adum, Kumasi Central**

As has been indicated earlier, the study had two case study areas. The first case is at Adum at the CBD of Kumasi (Figure 1). It is a heavily used footbridge receiving substantial numbers of pedestrians daily. In terms of structure, the Adum footbridge is a 70-meter long facility, commissioned in 2013 to ease human and vehicular traffic in the CBD of Kumasi—between Adum area and the Central Market of Kumasi. The infrastructure connects two major roads in the CBD. These are the *Adum to Kejetia Terminal (Osei-Tutu Ave) and Asafo Market to Central Market arterials*. The footbridge goes over the railway tracks that passes through the city's centre. It has 32-stairs and about a 90 meters track on both sides of the bridge for People Living with Disabilities. It is also fitted with Public Toilet/Urinal on both sides; and lights for security and safety at night.

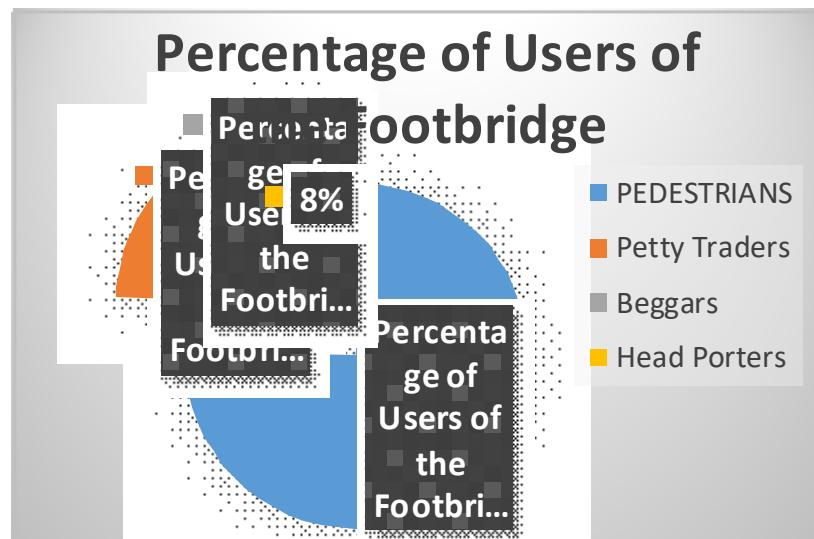
For its functioning, the footbridge receives an average over 15,000 pedestrians daily, between 6am and 6pm. On a typical weekday, the Adum footbridge has an average of 2,000 traders/shoppers/travelers within 50 meters radius during peak periods. This figure goes up to 5,000 on Saturdays and less than 800 on Sundays. Due to its central location, the footbridge also serves as a major meeting point for many informal business transactions and emerging/increasing criminal activities. Other activities observed within around the footbridge include stray and begging children and heaps of unkempt refuse.



**Figure 1: Location of Adum Footbridge, Kumasi Central**

**Source:** Owusu Ansah et al., 2019.

At peak moments, distributions of various users are shown in Figure 2. On the figure, daily flow on the footbridge is dominated by pedestrians and shoppers with 75% of human traffic on the bridge. Petty traders constitute 15% of users on the bridge during the day. Head porters and their children formed 8%. Beggars and street preachers constitute 3% of users *on the footbridge* at peak times



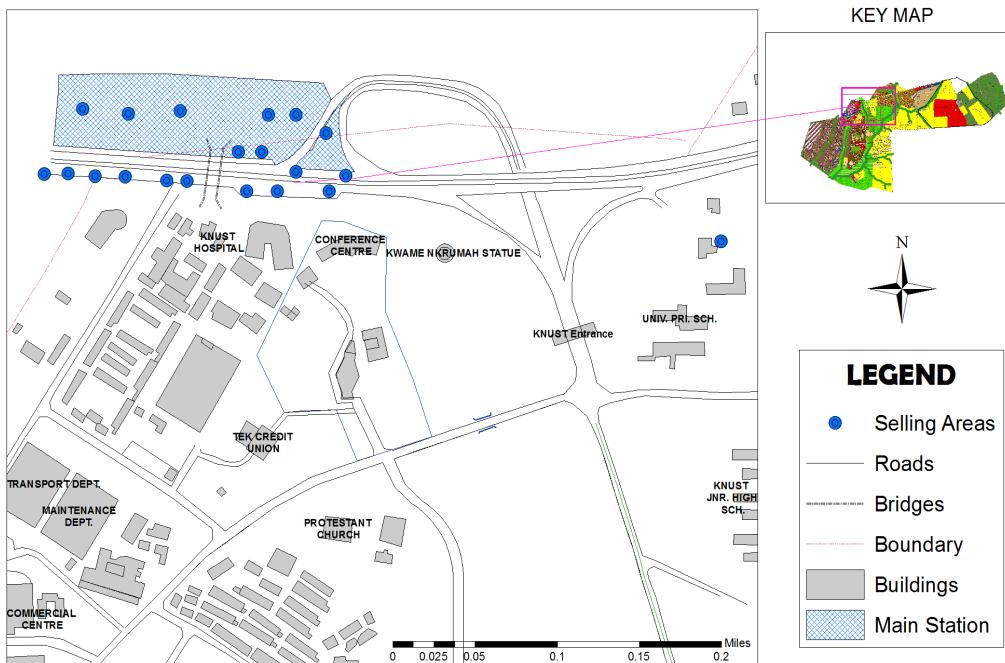
**Figure 2: Proportion of Users on the Adum Footbridge**

**Source: Field Study, April 2019**

The share of users on and around the footbridge presented in Figure 2, shows the intensity and diversity of uses to which the footbridge put. Though pedestrians form 75% of users counted at any point in time, it is important to take note of the emerging social and economic activities recorded during the field studies. These social and economic uses go beyond the initial aim of separating pedestrians from vehicular traffic; and ensuring their safety. Again, they generate multiple of economic activities within 100 meters radius of the footbridge and redefine its use.

#### ***4.2 Case Study Two—Functions and Uses of Footbridge at the KNUST Entrance***

In the second case study, the footbridge at the KNUST junction (Figure 3) was commissioned in December, 2015 to ease pedestrian–vehicular conflicts and reduce traffic crashes at the entrance of the university. It is also to improve vehicular flow into and out of the city towards the east (main road through the Eastern region to Accra etc.) It is a 26.5-meter disability friendly footbridge built to carry pedestrian from the university to Ayigya, an adjoining informal community and a market. It is a simple design with stairs, disabled walk ways and lights for safety and security at night.



**Figure 3: Location of Footbridge and Economic Activities at KNUST Entrance**

**Source: Field Study, April 2019**

In terms of daily functions, the footbridge receives an average of up to 3,000 pedestrians daily on weekdays between 6am and 6pm. This increases up to 3,500 on Saturdays and below 700 on Sundays. The footbridges have generated an extremely busy transport (taxis/buses) terminal/pick up and market/hawking area. There are a few beggars/street preachers (up to 10 at a time), over 500–700 traders and shoppers around the footbridge. It is the main pedestrian link to the KNUST hospital, security post, maintenance and main commercial area on the campus. Directly under the footbridge are pick up/drop off points for taxis/minibus. Groups of young men have virtually taken over the area below the bridge, as a vehicle terminal. This appears to be condoned by police officers. Some pedestrians still cross the dual-carriage main Accra-Kumasi road for taxis/minibus etc. (Figure 4)



*Figure 4: Movement and economic activities around the footbridge at KNUST's entrance.*

*Source: Field Study, April 2019.*

#### 4.3 Summary of Findings

A care observation from the two case studies presented above reveals that beyond pedestrian safety, footbridges produce social, economic spaces and activities, often not envisaged by engineers, planners and city authorities. The observed interactions and chaotic situations at the two locations are business produced and supported by the use, abuse and non-use of the two footbridges. For the two location similar economic activities were observed as follows:

- **Economic spaces and activities**-These manifest as hawkers' markets, street vending activities, and vehicle terminals/drop off/pick up points, places for head porters etc. These are spaces originally left to be open areas around the footbridges turned in areas of intense economic activities, patronized by pedestrian. These economic activities do not only re-shape mobility; but also create jobs for over 2,000 people who engage in various wholesale and retail activities around the footbridges and beyond.

- **Social spaces and activities**– Many social activities have emerged around the two footbridges. These including areas seen as beggars' hub and spaces for street preachers. Streetpreaching is an emerging phenomenon seen at many places in urban Africa, but yet to receive research attention. There were also places around the two footbridges where mentally challenged persons were found either loitering or sleeping. Some of the pedestrians interviewed also indicated that they have used the footbridge as meeting points and land marks to direct their visitors in the past. All these activities point to uses of the footbridge beyond safety of pedestrians. For instance, observations of beggars, street preachers and mentally challenged people point to some gaps in urban social interventions.
- **Places of crimes and areas with safety concerns**– Aside the economic and social spaces and activities, some pedestrians reported cases of pick pocketing, street fraud, traffic offences and locations for hard and prohibited drug users. Unfortunately these areas for safety concerns were observed at both study location and have tendency of escalating. Again, these points to some failures in state security systems and decreasing social order.

In conclusion, though most pedestrian feel their needs are addressed, the spaces for social and economic activities presented above create new dynamics for all users. In some cases, these spaces are serving as employment and social inter-connectedness. There are also cases where the uses of the footbridges appear to be counter-productive to the intended use of the infrastructure. An example is that the vehicular-pedestrian conflicts which were to be reduced are rather re-created and continue to deteriorate. There are also loss of items and children, pedestrian knock-down and other undesirable occurrences.

## 5. Recommendations

A number of questions can be raised from the study's findings. These questions include the following:

- Do pedestrian footbridges address the *actual needs* of urban dwellers and pedestrians in Kumasi, and by extension, Ghana?
- Are all the *possible uses* of pedestrian footbridges explored, understood and considered in their design(s), maintenance and management?
- Are urban planning and mobility challenges addressed or exacerbated by pedestrian footbridges? and
- Is post implementation management of footbridges handled well in the face of all the challenges associated with socio-economic activities around footbridges?

To these questions, the following recommendations are made as entry points for the design and implementation of pedestrian footbridges in urban Ghana and elsewhere in urban Africa.

- The design of pedestrian footbridge must critically consider the daily complex activities that shape the realities of urban life in Ghana. This may call for designs that include other relevant uses such as shopping areas, car park, meeting areas and crèche for the children of traders etc.
- It is clear from the above that spaces around footbridges have not been fully identified, understood and used to the advantage of city authorities. This study is of the view that, city authorities could harness the numerous social and economic spaces around footbridges to their advantage.
- The above proposal could be used by city authorities to generate revenue for the metropolitan/municipal assemblies since the other uses could be rented out to prospective investors.
- Finally, harmony of flow should be achieved around footbridges not through the brute force of city guards; but through constructive and locally appropriate designs of pedestrian infrastructure.

## 6. Conclusions

This study intended to provoke discussions around the construction and usage of pedestrian footbridges in urban Ghana and across African cities. The study suggests that footbridges could do more than just ensuring pedestrian safety. The full advantages of these important pedestrian infrastructure can be harnessed through innovative and creative designs, rather than the current conservative design approaches; and brutal attempts by city authorities to regulate their uses.

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